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LIST OF ABBREVIATIONS

AIDS	Aquired Immuno Deficiency Syndrome
CDM	Construction Design and Management
CTS	Carpal Tunnel Syndrome
COPD	Chronic Obstructive Pulmonary Disease
E CMBA	East Cape Master Builders Association
GDP	Gross Domestic Products
GPA	Global Plan of Action
HIV	Human Immunodeficiency Virus
HSE	Health and Safety Executive
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ILO	International Labour Organization
IOSH	Institution for Occupational Safety and Health
JISHA	Japan Industrial Safety and Health Association
MoHSS	Ministry of Health and Social Services
MSDs	Musculoskeletal Disorders
NIHL	Noise Induced Hearing Loss
NSA	Namibia Statistics Agency
OHS	Occupational Health and Safety
OHSMS	Occupational Health and Safety Management System
OSHA	Occupational Safety and Health Administration
PHC	Primary Health Care
PPE	Personal Protective Equipment
SADC	South Africa Development Community
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
UN	United Nations
UNISA	University of South Africa
US	United States
USA	United States of America
WHO	World Health Organization
VWF	Vibration induced White Finger

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Occupational health and safety (OHS) refers to the science of workplace hazard anticipation, recognition, evaluation and control that could impair the health and well-being of workers, workplaces surrounding communities and the environment (Alli 2008:vii). Amponsah-Tawiah and Dartey-Baah (2011:120) define ooccupational health and safety as a broad concept which entails the physical, mental and psychosocial well-being of the worker in relation to the work and the working environment aimed at providing a safer working environment. As a result, a work organisation will face a decrease in workplace accidents and injuries, encounter increased higher employee retention rates and have an enhanced corporate image, a condition that creates safer workplaces for the benefit of employers, workers and the community (Amponsah-Tawiah & Dartey-Baah 2011:121).

According to the International Labour Organization (ILO) (2014a:1) about 6, 300 workers die daily due to occupational accidents and diseases. The construction industry accounted for the majority of occupational accidents, injuries, fatalities and diseases, which shows that is one of the most dangerous sector than any other sectors (Health and Safety Executive 2011b:1). The 2012 rate of occupational injuries and fatalities in the United States of America's (USA) construction industries is twice higher than all other industries (Irumba 2014:109). Furthermore, several countries have a poor mechanism on reporting work places accidents, injuries and fatalities with only fatalities and severe work-related injuries being the most notified (Burton 2010:6). Nonetheless, inadequate information regarding OHS leads to difficulties in motivating the implementation of relevant OHS international standards at workplaces (Matiko 2012:4).

Studies that investigated occupational accidents, injuries, fatalities and diseases in the Namibian construction industry are very limited and statistics regarding occupational diseases for construction workers from the Ministry of Health and Social Services of Namibia or from the Ministry of Labour and Social Welfare (currently known as Ministry of Labour, Industrial relations and Employment creation since March 2015) were not identified. However, the rate of occupational injuries and fatalities in the Namibia construction industry is higher in comparison to other industries as indicated below (Ministry of Labour and Social Welfare of Namibia 2014:5). The 2010/2011 financial year witnessed construction injuries accounting for 22% of all of Namibia's workplace injuries (Ministry of Labour and Social Welfare of Namibia 2011:5) and this number increased to 38.96% in the 2011/2012 (Ministry of Labour and Social Welfare of Namibia 2012b:10). Although there was a decrease in the construction industry injuries from 6.31% in 2012/2013 and to 4.53% in2013/2014, incidences of injuries and accidents in the sector remain higher (Ministry of Labour and Social Welfare of Namibia 2014:5). OHS is thus important and failure to adhere to its regulations and expectations affects workers socially, physically and psychologically, and leads to legal proceedings and huge financial costs to the country (Burton 2010:15). This study thus explores the existing health and safety hazards, and occupational accidents, injuries, fatalities and diseases, in the construction industry of Windhoek in Namibia.

This chapter introduces the study by providing an overview of the entire thesis. It begins with a discussion on the background to the study followed by the research problem, the aim, study objectives and significance as well as definitions of key concepts used in this study. The chapter also highlights the foundation of the study, the research design and method used, and the scope of the study. This chapter concludes with an outline of all the chapters that are presented in this thesis.

1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

1.2.1 The source of the research problem

The construction workers' health and safety have indeed been of great concern globally due to the hazardous nature of the work processes (Pesantes-Tavares 2011:15). Construction work is dynamic in nature and characterised by constant changes in the working environment, poor working and environment conditions, and exposing workers to potential hazards such as noise, dust, vibration and ergonomic conditions (Pinto, Nunes & Ribeiro 2011:616). According to the United States Department of Labour's 2010 Bureau of Labour Statistics, occupational hazards, such as falls from height, were higher and accounted for 14% of the fatal construction industries injuries in the USA (Miller

2012:5). Furthermore, construction work takes place mostly on open environments which exposes the construction workers to bad weather conditions such as a cold, windy or hot environment (Pinto et al 2011:616) and may lead to occupational accidents and work related diseases (Alshebani & Wedawatta 2014:638).

Construction workers are also at risk of developing common occupational diseases such as back pain, asthma, Noise Induced Hearing Loss (NIHL) and cancers which could be avoided if employees and workers set up and implement occupational health and safety preventive measures (Verbeek & Ivanon 2013:79). Construction-related accidents and diseases are mostly associated with unsafe activities or behaviour among workers and employers (Lee 2010:4). Furthermore, occupational accidents may result in numerous damages and losses such as in worker's compensation and medical services payments (Liao & Chiang 2015:363).

The construction industry's employers face huge OHS challenges but are reluctant to correct unsafe or potentially hazardous working conditions owing to the financial implications involved (Zin & Ismail 2012:743). At the same time, the employees are neither aware of acceptable occupational health and safety practices nor do they conform to safety cultures at work due to lack of knowledge and skills (Pinto et al 2011:617). Nonetheless, employers incur great losses due to occupational injuries, diseases and fatalities that occur in this sector, with most of these incidences being caused by conditions that are known and observed almost every day but ignored (Mwanaumo & Thwala 2012:16). Consequently, construction workers and their families become traumatised by unexpected occupational injuries, diseases and fatalities which all have a negative socio economic impact (Pinto et al 2011:617).

Burton (2010:7) stated that some organisations lack skills in developing and implementing strategies that improve workers' working conditions. As a result, a majority of organisations in the developing countries are not developing nor implementing OHS programmes, which results in non-compliance with international OHS legislations (Seoke & Kamungoma-Dada 2014:14). As result, construction workers are faced with unsafe working conditions that may lead to occupational injuries, diseases and fatalities (García-Herrero, Mariscal, García- Rodriguez & Rtzel 2012:1760).

The Ministry of Labour and Social Welfare of Namibia raised its concern after carrying out workplace inspections during the period of 2013/2014 (Ministry of Labour and Social Welfare 2014:5). The inspections indicated that employers were not reporting occupational accidents and injuries possibly due to employers' ignorance of procedures to report accidents or fear of repercussions (Ministry of Labour and Social Welfare of Namibia 2014:5). There is also no statistical data about occupational-related diseases from Namibia's construction industry (Ministry of Health and Social Services (MoHSS) of Namibia 2013:3).

1.2.2 Background to the research problem

The construction industry is indeed significant for any nation's socio economic development, yet the sector encounters frequent high work-related accident rates and subsequent ill health (Phoya 2012:1). Over 1000 construction workers die annually throughout the world due to work-related accidents and diseases (Hinze & Giang 2008:636). These workplace deaths and injuries are the result of employers or employees' failure to comply with legislation regulating OHS (Zhou, Whyte & Sacks 2012:102; Zin & Ismail 2012:743). In addition, the construction industry offers hazardous and dangerous occupations, which expose construction workers to several hazards and risks (Pinto et al 2011:618). Liu and Tsai (2012:1068) note that the construction industry's hazards cause financial losses and personal injuries which may affect the health status of construction workers and the duration of the construction project. As a result, the unfortunate situations of occupational injuries, accidents and diseases affect the productivity and the economic status of the countries in a negative way (Liao & Chiang 2015:363).

The global construction industry has been witnessing varying levels of workplace accidents. Japan's construction industry experiences a higher accident rate. The country's 2008 construction industry's serious accidents rate was at 93 cases compared to the 75 cases in 2009. However, 87 cases of occupational accidents were reported in 2010, which is an increase by 12 cases. Further increases were witnessed in 2011 where 105 cases were recorded and this if followed by decreases as noted in the 95 and 93 cases in 2012 and 2013, respectively. Japan, however, witnessed an increase in the number of serious accidents in all industries from 255 cases in 2011 to 284 cases in 2012, thus showing the continued existence of hazardous conditions in its industrial sectors (Japan Industrial Safety and Health Association 2014:4).

There are other accident and fatality rates from other developed countries that should be considered in the mapping of this study's background. The USA witnessed 8 993 deaths at construction workplaces during the period 2003 to 2011, which is the highest number of fatalities among deaths occurring in other industries over this period of time (Mahmoudi, Ghasemi, Mohammadfam & Soleimani 2014:125). The Labour Statistics of Taiwan puts the fatalities rate per 1 000 workers in the Taiwanese construction industry at 0.13 in 2008, which is much higher than the fatality rate from accidents in other industries (Cheng, Leu, Cheng& Lin 2012:214). In addition, the United Kingdom's (UK) construction industry, which contributes about £80 billion annually to the Gross Domestic Product (GDP), and is subject to the country's Health and Safety Executive (HSE) regulatory body for OHS, accounted for 31% of workers' fatal injuries and 40% occupational cancer deaths in 2014. Most of the deaths were caused by cancers arising from past exposures to asbestos and silica (Health and Safety Executive 2014:7). It can be inferred that the construction industries in developed countries also face challenges that are related to an increase in occupational accidents, injuries and diseases (Raheem & Issa 2016:301).

Developing countries experience higher rates of injuries and occupational diseases than developed countries due to the lack of effective health management practices in the construction industry, reliance on outdated legislation systems and lack of statutory requirements for meeting the health and safety standards (Mwanaumo & Thwala 2012:12). The conditions in the developing countries, especially those from the African continent, should therefore be considered too in the discussion on the background to this study. In Tanzanian, construction industry has been ranked the second most dangerous industry after mining due to a constant increase in fatalities and permanent disabilities that has been experienced in the country (Phoya 2012:1). A cross sectional survey by Irumba (2014:109), which analysed accidents in the construction industry in Kampala, Uganda found an injury rate in Kampala alone of 3 797 per 100 000 workers and a fatality rate of 84 per 100 000 workers, which are higher accident and fatality rates than other industries.

In addition, lack of leadership commitment and failure to implement OHS in South Africa contributes to the often increasing injuries and fatalities in the country's construction industry (Cassiem, cited in Jacobs 2010:470). This is evidenced by the 2010 and 2011 fatality and injury rates in the South Africa's construction sector which stood at 19.2 and 14 626 per 100 000 workers, respectively. Although this shows an improvement when compared to the fatality rate of 53.51 per 100 000 workers reported in the country's 1990s construction industry, it is clear that occupational health and safety challenges remain high in South Africa (Arquillos, Romero & Gibb 2012:381).

Namibia is one such developing country that experiences high occupational injury and accidents incidences. The country is situated in Southern Africa, shares its borders with Angola in the north, Zambia in northeast, Zimbabwe in east, Botswana in the south east, South Africa in south and with the Atlantic Ocean to the west, as shown in figure 1.1. Namibia covers 824 116 square kilometres and has a population density of 2 people per square kilometre (Namibia Statistic Agencies 2011:31). The Namibia Ministry of Health and Social Services and ICF International (2014:2) states that Namibia has a population of 2.28 million people, with a growth rate of 2.6% and an estimated life expectancy of 50 years for females and 48 years for males. In 2011 construction industry contributed to 16.2 percent of Namibia GDP. This arises from increased construction works carried out in the electricity and water sector, as well as in the general government sector. Residential and commercial building activities also contributed to the construction increase as reflected in the value of completed buildings that increased by 24.6% (Namibia Statistics Agency 2012:5).

Figure 1.1 Map of Southern Africa with geographical location of Namibia

(Source: www.Google.Com.na/maps/places/Southern+ Africa)

The Labour Act, No 11 of 2007 section 101 (Republic of Namibia 2007b) and the Regulations relating to the health and safety of employees at work (Republic of Namibia 1997:18) were constituted to provide guidelines on health and safety at work in Namibia. The regulations require all employers to promote and maintain the well-being of their employees during worksite activities and consider health and safety during the execution of projects (Republic of Namibia 1997:488). Furthermore, section 3 of the regulation, as stipulated in Regulation no 156 of 1997, states that employers should implement the occupational health and safety management programmes that assist in the prevention of injury, diseases and accidents and lead to high productivity (Republic of Namibia 1997:21). Employers in the construction sector are therefore expected to ensure the safety of workers and machineries in the workplace as well as consider that the work is done according to ergonomic principles (Republic of Namibia 1997:489).

However, the health and safety of workers in Namibia’s construction industry remains a challenge for the sector as reported in the 2014 Ministry of Labour and Social Welfare annual report (Ministry of Labour and Social Welfare of Namibia 2014:3). Some workers have no access to OHS as some construction sites lack developed OHS programmes, a condition that has a negative impact on construction workers (Ministry of Labour and Social Welfare of Namibia 2014:2). The employers and workers usually justify this anomaly by citing reasons such as, “it has been done like that since our forefathers” and financial constraints. Nevertheless, companies are unaware that it is more costly to deal with injuries and fatalities than to prevent them from occurring (Links & Haimbodi 2011:1) such as employees compensation, hospital cost and loss of time. Therefore, it is indeed necessary for the construction site managers to ensure that OHS programmes are established and implemented at all construction sites (Muiruri & Mulinge 2014:2).

Namibia’s construction industry has been characterised by a higher rate of occupational accidents, injuries and diseases as noted in the annual report from the Ministry of Labour and Social Welfare of Namibia, as described hereafter. The 2012/2013 financial year witnessed an all sectors total number of injuries of 49, with 16 cases (32.65%), occurring in the construction industry. There were 4 fatality cases, 9 cases of major injuries and 3 of minor injuries in the 2012/2013 financial year (Ministry of Labour and Social Welfare of Namibia 2013:1). However, the construction industry also witnessed 8 cases of major injuries during 2013/2014 and 2014/2015, respectively, which is the highest among all industries (Ministry of Labour, Industrial relations and Employment creation 2015:4). In fact, it is evident that the construction sector has witnessed an increase in accidents and fatalities as evidenced by the 33 fatality cases reported during the 2010/2011 to 2015/2016 period, which are higher when compared to the 10 cases of fatalities from all other industries reported during the same period (Ministry of Labour, Industrial relations and Employment creation 2016:1). These injuries and fatalities are mostly the result of construction projects that are started without an approved occupational health and safety plan from the Chief Inspector at the Ministry of Labour and Social Welfare of Namibia, hence the lack of safe working procedures at some construction sites (Links & Haimbodi 2011:1).

A study of Chinese investment construction companies in Namibia conducted by Herbert and Iipumbu (2009:11) found out that there were no health and safety policies, protective clothing provision nor health and safety committees in place at most construction companies. Despite these alarming statistics, there have been few or no serious efforts expended to improve the health and safety conditions of the construction workers in Namibia and no comprehensive study conducted on the health and safety situation in Namibia’s construction industry.

1.3 STATEMENT OF THE RESEARCH PROBLEM

The construction industry provides employment opportunities to skilled and non-skilled workers, but is nevertheless regarded as very risky, owing to the high injuries, occupational-related diseases and fatality rate (Dermirkesen & Arditi 2015:1160). It has been noted that there is an increased failure, by the Namibian construction industry, at implementing OHS programmes at construction sites (Ministry of Labour and Social Welfare of Namibia 2014:2). The 2012/2013 financial year witnessed the Ministry of Labour and Social Welfare conducting an inspection to investigate the construction sites' compliance with OHS legislations in response to the high occupational accidents that had been reported by the construction industry. The investigation revealed that most (60%) of the construction sites were non-compliant with OHS legislative requirements (Ministry of Labour and Social Welfare of Namibia 2013:4). In addition, it was reported during the 2014/2015 financial year that 62% of the construction sites were rated as poorly compliant with OHS regulations (Ministry of Labour, Industrial relations and Employment creation of Namibia 2015:9). This finding poses a challenge as construction workers are exposed to occupational hazards, accidents, injuries and diseases, all of which may affect productivity (Liao & Chiang 2015:363).

Noncompliance with OHS regulations leads to an increase in fatalities in the construction industry in Namibia as evidenced by 14 cases of workplace fatalities reported from the construction industry during the 2010/2011 and 2011/2012 financial years (Ministry of Labour and Social Welfare of Namibia 2012a:4). Nevertheless, the 2012/2013 and 2013/2014 years witnessed a fatalities rate decrease to 7 cases per financial year (Ministry of Labour and Social Welfare of Namibia 2013:4). The year 2014/2015 also reported 7 cases of work-related fatalities from the construction industry, which indicates that the fatality rate remains higher in the country's construction industry (Ministry of Labour, Industrial relations and Employment creation of Namibia 2015:11). The high work-related accidents and fatalities have affected the country's economic status in a negative way, especially through the payment of compensation, medical services for the injured and those with ill health, and through the loss of production arising from injuries and sickness-related absences (Phoya 2012:1).

The OHS challenges faced by the construction industry are also caused by the government of Namibia's lack of enforcement of OHS as there is no systematic approach in OHS management. Ideally, a systematic approach in OHS management at work includes the development of OHS programmes which includes OHS policies development, and a continuous monitoring of OHS programmes to prevent occupational hazards and diseases (Health and Safety Executive 2011b:26). Moreover, there is a paucity of empirical data on OHS in Namibia's construction industry as evidenced by the lack of studies conducted on OHS in the construction industry in Namibia. However, reviewed literature from developed and other developing countries acknowledges that construction workers are faced by a number of OHS challenges which affects their quality of life (Abrey & Smallwood 2014:4). Hence, the insufficient knowledge on the magnitude of the occupational hazards, injuries, diseases and associated risks in the Namibian construction industry motivated this researcher to conduct the study to address the gaps/challenges in Namibia's construction industry.

1.4 AIM OF THE STUDY

1.4.1 Research purpose

The purpose of the study was to develop evidence-based practical guidelines to promote occupational health and safety of workers in the construction industry of Windhoek in Namibia.

1.4.2 Research objectives

The objectives of this study were to:

- Describe the socio-demographic profiles of workers in the construction industry of Windhoek in Namibia.
- Conduct facility inspections and determine the occupational health and safety hazards prevalent in the construction industry of Windhoek in Namibia.
- Assess the construction industry workers' awareness of OHS aspects.
- Review documents to determine the nature of occupational accidents, injuries and diseases among workers in the construction industry of Windhoek in Namibia.

- Investigate the occupational health and safety legislative provisions and compliance among construction sites in Windhoek, Namibia.
- Develop the practical guidelines to promote OHS in the construction industry of Windhoek, Namibia.

1.5 HYPOTHESES

The status of the Windhoek construction industry's occupational health and safety is poor due to inadequacies in the provision and lack of robust enforcements of occupational health and safety legislations by the Ministry of Labour, Industrial relations and Employment creation.

1.6 SIGNIFICANCE OF THE STUDY

This ground-breaking study provides a description of the current OHS status of the construction companies in Windhoek, Namibia. It is envisaged that the study will facilitate the improvement of OHS in the country's construction sector. Very little is known about the OHS status of Namibia's construction industry, hence, this study will offer a chance for policy makers to appreciate better the OHS situation in the construction industry and the ways in which the sector can be improved as suggested in the study findings. Furthermore, the recommendations of this study will influence the development of policies seeking to promote OHS in the construction industry in Windhoek, Namibia. The guidelines developed as the primary output of this project will assist the construction industries in Namibia to promote the status of OHS as well as suggest modus operandi strategies for the prevention of occupational health injuries, diseases and fatalities and improvement of the workplace environment. Finally, this study will contribute to the growing body of knowledge and research on the occupational health and safety in the construction industry.

1.7 DEFINITIONS AND OPERATIONALISATION OF KEY CONCEPTS

1.7.1 Occupational health

The International Labour Organization (ILO) and World Health Organization's (WHO) Committee on Occupational Health's first session in 1950, define occupational health as a strategy for promoting and maintaining the highest degree of physical, mental and social well-being of workers in all occupations, by preventing health deviation, risks and hazards control and the adaptation of workers to both the job and working environment (Salminen 2015:727). In this study, occupational health refers to the maintenance and promotion of physical, mental and social well-being of construction workers in Windhoek, Namibia by ensuring that construction workers are free from injuries, illness or pain that can arise from construction activities.

1.7.2 Occupational safety

Occupational safety refers to the prevention of accidents and maintenance of workplaces free from injuries (Acutt & Hattingh 2011:106). According to Phoya (2012:5), occupational safety refers to the relative freedom from danger, harm and risk to people or properties caused accidentally or deliberately at work. In addition, occupational safety involves ways seeking to control recognised hazards in order to achieve an acceptable level of risk. In this study, occupational safety means a state of maintaining the health and wellbeing of workers in the construction work environment in Windhoek to ensure that construction workers are free from harm, danger, workplace illnesses, accidents, injuries and fatalities.

1.7.3 Worker

A worker is defined as a member of the workforce or an individual under the employment of another person who receives or is entitled to receive remuneration (Hughes & Ferret 2005:2). In this study, a worker is a member of a workforce in the construction industry in Windhoek, Namibia employed in the sector during the data collection time.

1.7.4 Employer

Employer refers to any person who provides work for any person and remunerates that person (Stanton, Kielblock, Schoeman & Johnston 2007:375). In this study, employer refers to persons who provide work for persons in the construction industry of Windhoek, Namibia during the time of data collection.

1.7.5 Construction industry

The construction industry is defined as a sector engaged in land preparation, infrastructure assembling, building, dismantling, renovation, maintenance or erecting additional buildings (Behm 2008:175). In this study, the construction industry refers to the organisations or companies engaged in land preparation, infrastructure assembling, building, dismantling, renovation, maintenance or erecting additional buildings in Windhoek, Namibia during the time of data collection.

1.7.6 Work

Work refers to the use of bodily or mental power in order to do or make something or an activity as a means of earning money (*Oxford Mini Dictionary and Thesaurus* 2008:763). In this study the term work refers to physical and mental effort or activity directed towards the production of something within the construction industry in Windhoek, Namibia.

1.7.7 Work environment

Work environment refers to the place or a premise of the environment where a person performs work in her/his employment (Acutt & Hattingh 2011:37). This study defines a work environment as a construction site or location in Windhoek, Namibia where construction workers perform their duties during the time of data collection.

1.7.8 Hazard

A hazard is defined as the potential of something in the workplace to cause harm, injury or damage to property or a person, plant or the environment and thus leading to production losses or increased liabilities (Hughes & Ferret 2005:2). Hazards in this study are any potential action, omission or negligence which can cause harm, incident or injury to workers or property at the targeted construction sites in Windhoek, Namibia.

1.7.9 Risk

Risk refers to the likelihood of a specified undesired event or damage occurring due to the realisation of a hazard or during work activities or by the products and services created during work activities (Acutt & Hattingh 2011:379). In this study, a risk refers to the probability that damage to property, danger or injuries can occur to workers at the construction industries located in Windhoek, Namibia as a result of the nature of work activities or environmental exposures.

1.7.10 Occupational accident

An occupational accident is defined as unplanned and undesired circumstances arising out of or during work that give rise to ill health or injury, damage to property, the plant or the environment, and lead to production losses or increased liabilities (International Labour Organization 2012:6). In this study, an occupational accident refers to a work-related exposure to an unplanned event which results in injury or ill-health or damage experienced by construction workers while working at the targeted construction sites in Windhoek Namibia.

1.7.11 Occupational incident

An occupational incident refers to all undesired circumstances and near misses which can cause accidents (Health and Safety Executive 2006:76). In this study, an occupational incident refers to undesired circumstances and near misses that can result in work-related accidents being experienced by workers within the targeted construction industry in Windhoek Namibia.

1.7.12 Occupational injury

An occupational injury refers to any person injured or any death resulting from occupational accidents (Ministry of Health and Social Services of Namibia 2006:20). In this study, an occupational injury refers to the injury sustained by the construction worker arising from an accident at a construction site in Windhoek, Namibia.

1.7.13 Occupational disease

An occupational disease is an illness contracted due to an exposure to the risk factors arising from work activities (International Labour Organization 2013b:4). In this study, an occupational disease refers to an ailment contracted during exposure to the risk factors arising from construction work activities in Windhoek, Namibia.

1.7.14 Occupational fatality

An occupational fatality refers to the death that occurs while a person is at work or performing work-related activities (ILO 2012:7). In this study, an occupational fatality refers to the death that occurs while a person is performing work-related activities in the construction industry of Windhoek, Namibia.

1.7.15 Guideline

A guideline is a principle put forward to set standards or determine a course of action (Maabela 2015:12). In this study, a guideline refers to a systematic, practical recommendation developed by the researcher to promote OHS in Windhoek, Namibia's construction industries on the basis of the study findings.

1.8 THEORETICAL FRAMEWORK

The theoretical framework, the WHO's healthy workplace model provides the background for the study.

1.8.1 The World Health Organization's healthy workplace model

The study is underpinned by the WHO healthy workplace model (Burton 2010:1). This framework aims at promoting workplace health and safety and the protection of workers from all hazards and risks which may arise due to the nature of their work (Burton 2010:11). The WHO healthy workplace model maintains that there should be a comprehensive framework in the workplace to prevent occupational accidents, injuries and diseases. The framework should address the physical work environment, psychosocial work environment, personal health resources and the enterprise's community involvement (refer to chapter 4).

1.9 RESEARCH DESIGN AND METHODS

1.9.1 Research design

A quantitative, cross-sectional, exploratory and contextual study design was used in this study to describe the variables. In addition, a retrospective design was used to engage in a document review and the working environment was inspected using a checklist.

1.9.2 Study setting

The study's setting included all construction sites in Windhoek, Namibia which were in operation during the time of data collection.

1.9.3 Study population

The target population consisted of 13 construction sites located in Windhoek and all 1097 construction workers in the construction sites operating during the time of data collection in Windhoek, Namibia. Furthermore, all documents regarding reported occupational accidents, injuries and diseases from Windhoek's construction industry held by the Ministry of Labour, Industrial relations and Employment creations for the duration of five years were reviewed.

1.9.4 Sampling

Census sampling was employed in all three stages to sample all 13 construction sites and 1 097 construction workers who were available during data collection time. Furthermore, census sampling was used for all documents related to reported occupational accidents, injuries and diseases from the Ministry of Labour, Industrial relations and Employment creation for the period of 5 years, from 2011/2012-2015/2016.

1.9.5 Data collection

Data was mainly collected by the researcher for a period of six months from October 2014 to March 2015. The data was collected using face to face interviews, observations and retrospective document reviews. The researcher gathered data using a self-designed structured questionnaire, document review checklist and site inspection checklist adapted from the WHO healthy workplace model for data collection. However, the data regarding occupational injuries, accidents and diseases for the period of 5 years gathered from a retrospective document review was collected from October 2014 up to April 2016.

1.9.5.1 Instruments

The researcher used questionnaires to obtain the socio demographic characteristics and the data regarding the OHS status in the Windhoek construction industry. In addition, a site inspection checklist was used to inspect the working practices, occupational hazards and occupational health and safety situations at construction sites that participated in the study. The researcher used the site inspection checklist to assess for the provision of occupational health and safety legislations which include OHS compliances. Documents were reviewed using a document review checklist to assess the types, nature and magnitude of reported occupational accidents, injuries and diseases.

1.10 DATA MANAGEMENT AND ANALYSIS

A professional statistician assisted the researcher with analysing the data using the Statistical Package for the Social Sciences (SPSS) version 23. Descriptive statistics and inferential statistics were used.

1.11 ETHICAL CONSIDERATION

Prior to the commencement of this study, ethical approval was obtained from the Research Ethics Committee of the Department of Health Studies at the University of South Africa (see Annexure A). Furthermore, permission was requested and obtained from relevant authorities and different construction sites in Windhoek, Namibia.

1.12 SCOPE OF THE STUDY

This study was conducted at all construction sites in Windhoek, Namibia which were operational during the time of data collection. The study investigated the occupational health and safety status in the construction industry.

1.13 CHAPTER OUTLINE

This thesis is divided into eight (8) chapters briefly described below:

- **CHAPTER 1: INTRODUCTION AND ORIENTATION OF THE STUDY**

This chapter outlines the introduction and background to the whole study. It focuses on issues that include problem statement, aim and objectives, hypothesis, significance of the study, theoretical framework used and ethical consideration and definition of concepts used in the study. The chapter also outlines the research design, scope and the thesis layout.

- **CHAPTER 2: LITERATURE REVIEW**

This chapter reviews information from literature related to the occupational health and safety status in the construction industries. Concepts and issues considered in the review include OHS status, OHS policies, laws and regulations available in the Namibian context and globally and occupational accidents, injuries and diseases in the world and in the Namibian context.

- **CHAPTER 3: THEORETICAL FRAMEWORK OF THE RESEARCH**

This chapter presents the WHO healthy workplace model which underpinned the study. The chapter also explains the components of the WHO healthy workplace model and its relation to promoting OHS in the construction industry particularly in the Namibian context.

- **CHAPTER 4: RESEARCH DESIGN AND METHOD**

This chapter presents a detailed description of the research design and method used in the study, such as the study setting, study population, sampling, data collection, data analysis, ethical consideration and validity and reliability of the study.

- **CHAPTER 5: DATA ANALYSIS AND PRESENTATION OF RESEARCH FINDINGS**

This chapter outlines the details of the research findings.

- **CHAPTER 6: DISCUSSION OF THE STUDY FINDINGS**

In this chapter the study findings are discussed and compared with other authors' findings

- **CHAPTER 7: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

This chapter concludes the study. The outlines the main study findings, recommendations, contributions of the study, study limitations and concluding remarks related to the research.

- **CHAPTER 8: DEVELOPMENT OF EVIDENCED BASED PRACTICAL GUIDELINES FOR THE PROMOTION OF OCCUPATIONAL HEALTH AND SAFETY OF WORKERS IN THE CONSTRUCTION INDUSTRY**

This chapter presents the practical guidelines for the promotion of OHS in the Namibian construction industry based on the study findings.

1.14 CONCLUSION

This chapter introduced the nature of the study, which was conducted to investigate the occupational health and safety situation in the construction industry of Windhoek, Namibia. It showed that Windhoek was selected for this study because it encounters higher construction activities and accidents and fatalities in comparison to other parts of the country. The chapter also described the orientation of the study, background information of the research problem, problem statement and the significance of the study. The aim of the study and research design was also presented and the researcher highlighted the ethical principles to be adhering to before, during and after the study. Lastly, an outline of the report's chapters was presented. The following chapter reviews literature related to the study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter focuses on a review of literature relevant to occupational health and safety (OHS) in the construction industry. The review starts with the literature on socio-demographic characteristics of the construction workers followed by the information regarding the awareness of construction workers on the existence of OHS. Furthermore, a review of the literature on occupational hazards, accidents, injuries and diseases in the construction industry is presented. Lastly, this chapter reviews literatures on both the national and global legislative compliance towards the construction industry OHS provisions.

2.2 LITERATURE SEARCH METHOD

The search was conducted in databases including EBSCO Host, Science Direct, Scopus, Emerlade and Web of Science. The five databases hold the main peer-reviewed journals focusing on the construction industry's occupational health and safety. A comprehensive and extensive search was implemented under the title "field" in the databases. The full search schema is "Title (construction), (health) and (safety)". The search was restricted to peer-reviewed journals written in English.

The reviewed literature include different aspects regarding OHS in the construction industry such as:demographic characteristics of the workers in the construction industry;awareness of construction workers on OHS aspects; occupational hazards in the construction industry; occupational accidents, occupational injuries in the construction industry; occupational diseases or health problems; and the construction industry OHS provisions towards compliances with the OHS legislative framework as presented below.

2.3 LITERATURE FINDINGS REGARDING THE SOCIO-DEMOGRAPHIC CHARACTERISTICS OF CONSTRUCTION WORKERS

The literature review sought information regarding the socio-demographic characteristics of the construction workers such as gender, age, marital status, level of educational, type of work and employment status as presented below.

2.3.1 Gender distribution of workers in the construction industry

Literatures state that the construction industry is male dominated (ILO 2015:1; Roche, Lee, Battams, Fischer, Cameron & McEntee 2015:124; Watts 2009:512) possibly due to its nature that is physically demanding (Gatti, Schneider & Migliaccio 2014:227). Several studies conducted in the construction industry indicate that all (100%) respondents were male (Phoya 2012:67; Yoon, Lin, Chen, Yi, Choi & Rui 2013:201). This observation is supported by Fullen's (2009:67) study which evaluated the United States of America's (USA) fall hazard training programme for residential construction workers using instructor led and new media delivery, where a majority of the participants were male.

In addition, Caponecchia and Sheils' (2011:254) study on the Australian construction workers' perceptions about personal vulnerability to workplaces hazards had males constituting the overwhelming majority of the participants. Similarly, Liao and Chiang's (2016:132) investigation on ways that can reduce occupational injuries attributed to inattention blindness in the construction industry in Taiwan shows that a majority of the participants were male. However, there is an increase in female construction workers participants in research by ILO (2015:21) conducted in Asian countries such as Kazakhstan, Singapore and Mongolia. Furthermore, women in India constitute up to 50% of the country's construction workforce (Baruah 2010:198).

2.3.2 Age distribution of workers in the construction industry

Construction workers are mostly young with a 25-35 years age range (Phoya 2012:67). This indicates that construction workers are mostly young and inexperienced (Walters 2010:4). However, Liao and Chiang's (2016:132) study on Taiwan's construction industry revealed that a majority of the participants were aged between 30 and 49 years. In addition, Miller's (2012:21) studies which assess the educational safety training solutions for Latino construction workers show that a majority of the participants were younger than 40 years.

This is contrary to the study by Yoon et al (2013:204) in which a majority of the participants were aged between 40 and 49 years. A further study by Eppenberger and Haupt (2009:6) observes that the construction industry in South Africa is aging as evidenced by the reality that a majority of the construction workers are aged 40 years and above.

2.3.3 Distribution of the marital status of workers in the construction industry

Several studies show that a majority of the construction workers are married (Liao & Chiang 2016:132; Rahmani, Khadem, Madreseh, Aghaei, Raei & Karchani 2013:162). Furthermore, the results form Alghadir and Anwer’s (2015:2) study on the prevalence of musculoskeletal pain among Saudi Arabian construction workers show that a majority of the participants are married.

2.3.4 Level of education status among the construction workers

A study by Phoya (2012:67) focusing on construction workers in Tanzania found out that a majority of the country’s construction workers have only attended primary school education with a few participants having tertiary education qualifications. This same observation is supported by Walters (2010:4) argument when conducted a literature review for construction industry studies globally, that a majority of construction workers are semiskilled or unskilled.

Nevertheless, a study by Rahmani et al (2013:162) focusing on an Iranian distribution company shows that a majority of the participants had Diploma qualifications followed by those who had completed high school. Furthermore, a study conducted in the construction industry of Saudi Arabia reveals that a majority of the participants completed secondary level education (Alghadir & Anwer 2015:2).

2.3.5 Distribution of types of work in the construction industry

A survey of the Saudi Arabian construction workers reveals that a majority of the participants are manual labour followed by carpenters (Alghadir & Anwer 2015:2). In support, a study conducted by Herbert and Iipumbu (2009:22) on Chinese investment in Namibia shows that a majority of the participants are labourers. However, this is contrary to Eppenberg and Haupt's (2009:6) study conducted in South Africa which indicates that a majority of the construction workers who participated in the study were plumbers followed by painters. Furthermore, a study conducted in Cape Town, South Africa by Himalowa and Frantz (2012:30) examining the effect of occupationally related low back pain on functional activities among male manual workers in a construction company shows that a majority of participants were masons.

2.3.6 Distribution of the construction workers' employment status

A majority of the workers in the construction industry are employed on a casual basis with 17% employed on full time or permanent basis (Phoya 2012:68). This observation is supporting by Rahmani et al (2013:162) in their observation that a majority of the participants on occupational accidents description and causes among electrician in Iran were recruited on a temporary basis. In addition, a report by the ILO (2015:12) states that an overwhelming majority of construction workers work on a temporary or casual basis. Finally, a study conducted on the Chinese construction companies in Namibia observes that a majority of the workers did not know whether they were recruited on a casual or permanent basis as they were not informed while the others were recruited on a casual basis (Herbert & Iipumbu 2009:23).

2.4 LITERATURE FINDINGS REGARDING THE CONSTRUCTION WORKERS' AWARENESS AND THE EXISTENCE OF OCCUPATIONAL HEALTH AND SAFETY

The section considers literature on the construction workers' awareness of the OHS provisions, the existence of the OHS policy and access to its OHS document, awareness of emergency preparedness and first aid, and awareness of hazard reporting and control. The findings are discussed below.

2.4.1 Construction workers' awareness of OHS provisions

The construction workers' awareness of OHS is of great importance as it determines the individual and organisational behaviour (Mwanaumo & Thwala 2012:12). However, a majority of construction workers have a low safety awareness (Zeng, Tam & Tam 2008:1157; Fung, Tam, Lo & Lu 2010:599), a condition that can have a negative impact on the workers and the organisation (Mwanaumo & Thwala 2012:12). A study by Zeng et al (2008:1157) which investigated the implementation of an OHS management system in China reveals that a majority of the participants indicated that the existence OHS existence was not satisfactory. A leaders' and project managers' poor awareness of OHS affects organisational safety performance (Zeng et al 2008:1157).

The provision of OHS and the availability of an OHS representative, OHS officer or OHS committee improves safety performance in an organisation (Alli 2008:49). Olle-Espluga, Vergara-duarte, Belvis, Menéndez-Fuster, Jódar and Benach (2015:56) assessed the impact of OHS in Spanish workers who were aware of the existence of their safety representatives and the results show that there was a higher level of OHS preventive measures when safety representatives were available. In addition, Walters (2010:2) study exploring the role of workers' representation and consultation in managing health and safety in the construction industry reveals that workers' representation improves health and safety outcomes.

2.4.1.1 Occupational health and safety policy existence and access

The occupational health and safety policy is one of the elements of an OHS programme which states the employer's aims and commitment to the OHS programme in order to protect the health and safety of workers (WorkSafe Bc 2013:8).

The WorkSafe Bc (2013:2) underlines that it is the responsibility of the employer, in consultation with workers, to establish an OHS policy. In addition, an OHS policy should state the aim of the employers with regard to the maintenance of an OHS programme. The OHS policy should be written in simple terms so that the workers can find it easy to understand Worksafe Bc 2008:8). The OHS policy should be implemented at workplaces should contain commitments to continuous improvement (Taderera 2012:114). The workers should also be aware of the policy's existence and the policy should be accessible at all times in the workplaces (WorkSafe Bc 2013:2).

Meanwhile, a study on the conditions within Chinese construction companies in Namibia reveals that a majority of the construction workers were not aware of the existence of the OHS policy or OHS-related documents in their respective construction sites (Herbert & Iipumbu 2009:28).

2.4.2 Construction workers' awareness on emergency preparedness and first aid

Construction workers should be aware of any emergency plan and the provision of first aid services on their construction sites. Furthermore, construction workers should receive training regarding possible emergencies at work, the evacuation procedures and all communications during emergencies (WorkSafe Bc 2008:41). It is also imperative that construction workers be aware of the first aiders at their workplaces and the location of the first aid kit in order to get timeous assistance when first aid is required (Irumba 2014:118). Hallowell (2008:142) points out that planning for emergencies reduces the severity of accidents or catastrophic events. In addition, the presence of qualified first aiders is important, hence, first aid services should be provided on site.

2.5 LITERATURE REVIEW FINDINGS ON OCCUPATIONAL HAZARDS IN THE CONSTRUCTION INDUSTRY

The literature argues that the nature of construction is such that work is performed in harsh environments, dispense locations and multiple construction sites (Olson, Varga, Cannon, Jones, Gilbert-Jones & Zoller 2016:122). The presence of hazards in the construction industry and hazard reporting and control are discussed in the sub-sections below.

2.5.1 Presence of occupational hazards in the construction sites

Construction industry has been regarded as the most hazardous industry to work in (Phoya 2012:29).Construction workers are exposed to physical, chemical, biological, ergonomic or psychosocial hazards (Olson et al 2016:122; Muema, Gatebe, Kirui & Adrian 2015:75) which may lead to occupational injuries (Eppenberger & Haupt 2009:6).

Furthermore, Pinto et al (2011:616) state that the common construction industry hazards are noise, vibration, dust, manual handling and direct exposure to weather. Consequently, construction workers' safety is compromised by exposure to a number of different occupational hazards that affect their safety (Beriha, Patnaik & Mahapatra 2012:182).

2.5.1.1 Physical hazards

Physical hazards on construction sites are defined as hazards from external sources that can harm a worker at the construction site (Saiman 2010:2; Zeng et al 2008:1157). Therefore, physical hazards cause most of the accidents, injuries and fatalities in the construction industry (Saiman 2010:2). Furthermore, the types of physical hazards are dust, noise, hot or cold temperature, working with asbestos, radiation exposures and fire or explosions (Phoya 2012:66; Pinto et al 2011:616; Elsayegh 2008:431; Saiman 2010:2).

- **Dust**

Zeng et al (2008:1157) assert that dust is a common physical hazard in the construction industry. The sources of dust at the construction sites are cement, silica, wood cutting, unpaved roads, cutting, grinding, blasting, etc. (Health and Safety Executive 2012:5). Furthermore, fine dust from cements, silica dusts or granulated plastic materials are more hazardous due to its size as it can be inspired and penetrate the lungs which may leads to permanent lung diseases (Wu, Zhang & Wu 2016:1658). In addition, the dust hazard in the construction industries may cause lung diseases such as cancer, silicosis, asthma and Chronic Obstructive Pulmonary Disease (COPD) (Ahmad, Isnin, Yahya & Salleh 2013:240).

Dust from the construction industries could lead to airpollution (Wu et al 2016:1656) which may affect the community were construction activities are taking place (Zhao, Zhao, Davidson & Zuo 2012:278). To mitigate dust Environmental standard ISO 1400 has been implemented by many organizations to prevent environmental pollution (Zhao et al 2012:278). However, many construction sites are not practising dust mitigation measures (Wu 2008:30).

A study by Wu et al (2016:1664) investigating construction dust pollution in China reveals that activities which cause dust the most in the construction industry are: the transporting of soil, earthwork excavation, back lifting, land levelling, on site manufacture of materials and on site stacking of materials. The study also found out that trucks are mostly overloaded when transporting soil and this aggravates dust generation as well as violate dust mitigation regulations. Wu et al (2016:1658) also state the sources of dust pollution and identified the regulations regarding dust pollution mitigation. Dust mitigation measures were conducted by nominating a dust control team in order to identify sources of dust in the construction industry and ensure that dust prevention measures existed during complete closed construction, paved ground usage, ready mixed concrete usage, smoke and dust control, transport vehicle management, and through a construction dust mitigation plan and wet construction (Wu et al 2016:1664).

More than 500 United Kingdom (UK) based construction workers die annually from lung cancer due to silica dust exposure (Institution of Occupational Safety and Health (IOSH) 2014:7). A study conducted by the Institution for Occupational Safety and Health among construction workers in the UK found out that dust at the construction sites is not always controlled due to employer's or workers' unawareness of the dust risk, ignorance among employers or workers, poor design in dust control, use of respiratory protective equipment rather than other dust control or dust suppression and failure to conduct face-fit tests (Institution of Occupational Safety and Health 2014:7). Therefore, experts recommend that exposure to dust in construction industry can be prevented through the use of a local exhaust system, water to suppress dust and using PPE such as respirators and dust mask (Verbeek & Ivanon 2013:80).

- **Noise**

Noise is regarded as a common health hazard in the construction industry (Leensen, Van Duivenbooden & Dreschler 2011:577; Li et al 2016:721). The source of noise in the construction industry is mostly the sound of vehicles (trucks), heavy equipment (excavators, cranes, pumps, etc.), the sound of construction activities (hammers knocking, wood creaking, etc.), and the sound of physical activities (walking and talking) (Lu & Davis 2016:184). Furthermore, Steenkamp (2008:43) points out that the sources of noise in the construction industry include plate and rolling compactors, excavators and poker vibrators. Therefore, a noisy working environment makes it difficult for construction workers to hear warning safety announcements, which consequently contributes to accidents at work (Lu & Davis 2016:186; Saiman 2010:11).

A longitudinal study conducted by Neitzel, Stover and Seixas (2011:912) in the US to assess the noise exposure in a cohort of construction workers shows that construction workers are exposed to noise which exceeds the recommended exposure limit of 85 dB (A) thus putting them at risk of developing Noise Induced Hearing Loss (NIHL). Furthermore, the findings of a retrospective review of records in the Netherlands' construction industry indicate that noise exposed workers suffered from hearing loss unlike the workers who were not exposed to noise. Therefore, the study concludes that there is an increase of noise induced hearing loss within workers that would have been exposed to 80 dB (A) to 96dB (A) for a long period (Leensen et al 2011:577). Consequently, exposure to a high noise level above 85 dB leads to NIHL and other chronic medical conditions such as Hypertension and Heart diseases (Steenkamp 2008:44) and mental health disorders (Lu & Davis 2016:185).

- **Vibration**

Several authors mentioned vibration as a common physical hazard in the construction industry (Paschold & Sergeev 2009:171; Singh & Khan 2014:239; Simeonov, Hsiao, Powers, Ammons, Kau & Amendola 2011:672; Zeng et al 2008:1157). Vibration is an oscillatory motion characterised by the frequency of the oscillatory cycle, its magnitude and direction (Palmer & Bovenzi 2015:1). Vibration in the construction industry is mostly caused by the usage of hand held vibrating tools such as chainsaws, concrete breakers, power hammers, hammer drills, core drills and tamping rammer machine (Singh & Khan 2013:239). The vibration is transmitted from hand held vibration tools to the hands, arms and shoulders of the operators (Singh & Khan 2014:230). Furthermore, powered vibrating tools operators can develop vibration-induced white finger (VWF) digital neuropathy, Carpal tunnel syndrome (CTS) and low back pain (Palmer & Boverzi 2015:3).

Singh and Khan's (2014:242) study which assess the effect of coating over the handle of a drill machine on vibration transmissibility reveals that vibration transmission to the operator is reduced by coating of the handle with rubbers and Rexene or coating a handle with sponge and velvet. The study reveals further that vibration transmission cannot be reduced when the operator is barehanded.

- **Non-ionising radiation**

Another type of physical hazards in the construction industry is non-ionised radiation. The sources of non-ionised radiation are the sun, welding arcs and specialised lamps (Vecchia, Hietanen, Stuck, Van Deventer & Niu 2007:9). The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has been working jointly with the WHO and ILO to advance for the protection of people and the environment against non-ionising radiation (Vecchia et al 2007:9). Non-ionising radiation, such as solar ultraviolet radiation, can cause damage to the eyes and skin. Therefore, it is of utmost importance that workers are provided with PPE such as hats, sunglasses and sunscreen (Vecchia et al 2007:11).

2.5.1.2 Chemical hazards

The chemicals used in the construction industry have a negative impact on human health and safety (Ahmad, Isnin, Yahya & Salleh 2013:239). The construction industry workers are exposed to chemicals such as solvents, paint and varnishes (International Labour Organization 2014a:3; Phoya 2012:35). Furthermore, construction workers engaging in renovations and demolition are exposed to chemicals such as lead-based paints, volatile organic compounds, fumes, liquids, gases, vapour and mists (Ahmad et al 2013:240). Chemicals may invade the workers body through inhalation, ingestion, and absorption or through the mucus membrane (Eppenberger & Haupt 2009:8). Consequently, chemical exposure can affect the body and result in poisoning (Muiruri & Mulinge 2014:9). It has also been noted that exposure to metal fumes may lead to respiratory system diseases such as asthma and chronic obstructive pulmonary disease (Montano 2014:1). It is, therefore, the responsibility of the employer to ensure that workers are protected against chemical hazards by conducting risk assessments and biological monitoring (Phoya 2012:35) as well as providing workers with PPE to prevent chemical hazard exposures.

The South African situation is such that the Hazardous Chemical Substances Regulations No 1179 were promulgated in 1995 to prevent or control of the exposure of employees to substances hazardous to health, monitor exposure, conduct medical examination and set up exposure limits (Republic of South Africa 1995:4). Nonetheless, construction workers are exposed to chemical hazards such as paints, glue and sealants with the workers having no knowledge of the risks posed by exposure to these hazardous chemicals (Ahmad et al 2013:240). Ahmad et al (2013:240) conducted a study to assess the knowledge sharing of research information from construction health and safety practices. The study found out that, lack of knowledge pertaining to building materials poses a serious risk as some building materials contain chemicals that the workers were not aware of. These authors also argued that it is a good practice to provide construction workers with information regarding hazardous building materials and the hazards mitigation measures before the beginning of construction work. Therefore, it is further suggested that workers must be informed about OHS risks and hazards during site meetings (Ahmad et al 2013:241).

2.5.1.3 Ergonomic hazards

Construction work involves physical demands such as repetitive movement, and using force to lift, push and pull or carry loads, which pose ergonomic hazards (Boschman, Frings-Dresen & Van der Molen 2015:90) and leads to musculoskeletal injuries such as lower back pain (Himalowa & Frantz 2012:28; Valero, Sivanathan, Boschè and Abdel-Wahab 2016:121). In addition, manual moving and handling is reported as a major cause of low back pain in a majority of manual construction workers in Cape Town, South Africa (Himalowa 2012:30).

Construction workers are at risk of ergonomic problems arising from performing work above shoulders and below knee level such as kneeling, bending, lifting of heavy and uneven sized construction materials, repetitive movements, pushing and working in uncomfortable positions (Smallwood & Ajayi 2009:23). Boschman et al (2015:91) conducted a study to investigate the use of ergonomic measures related to musculoskeletal complaints among construction workers in the Netherlands. The study stated that bricklayers and dry wall installers do most of their work in bending and twisted positions and perform repetitive hand-arm movements. Furthermore, the study reveals that an overwhelming majority of the respondents suggested that ergonomic measures should be used. However, a majority of the respondents revealed that they had not used ergonomic measures due to the unavailability of ergonomic equipment.

Smallwood (2011:29) conducted a study to determine South African architects and architectural designer’s level of knowledge, perceptions and practices regarding the mass and density of materials in the construction industry. The study found out that many of the construction workers’ lower back injuries are the result of manual moving and handling which are ergonomic related hazards. Furthermore, manual handling injuries lead to absenteeism and financial loss to both the worker and organisation (Himalowa 2012:28). Back injuries due to manual moving and handling also contribute to increases in early retirement due to incapacity (Himalowa 2012:32).

An improvement of the ergonomic factors and a reduction of physical loads in the construction industry can be achieved through the use of mechanised equipment such as hydraulic cramps or vacuum lifts in activities as paving brick roads, which reduce kneeling or squatting and frequencies of lifting loads. Furthermore, the use of silo trucks with automated pump systems reduces lifting frequencies, while a hydraulic crane and trolley can carry and adjust work heights among brick layers (Burdorf, Windhorst, Van der Beek, Van der Molen & Swustel 2007:139).

Domingo, De Pano, Ecat, Sanchez and Custodio (2015:1858) risk assessment on Fillipino construction workers also suggests that the implementation of job rotation and working shifts to reduce the strain and body part overuse, redesigning tasks to reduce poor posture, and encourage educating construction workers on ergonomic measures. Varero et al (2016:120) argue in support that, the prevalence of lifting, bending and awkward postures in construction work demands that the workers be educated on good postures and body movements in order to improve their quality of life.

2.5.1.4 Psychosocial hazards

The ILO defines psychosocial hazards as the intentional usage of power which harms the individual physically, mentally, spiritually or socially (Forastieri 2012:114). Psychosocial hazards, such as bullying and harassment, are mostly related to poor environmental and negative leadership behaviour (Milczarek 2010:11). Construction workers are at risk of psycho-social hazards due to work-related stress (Bonschman et al 2013:748). Furthermore, victimisation, in the form of aggression and violence, is a common type of psychosocial hazards in the construction industry (Phoya 2012:35). Construction workers often encounter aggression and violence, discrimination or victimisation by supervisors or by colleagues which may lead to depression or stress (Boschman et al 2013a:749). Thus, physiological and psychosocial hazards such as victimisation and violence at work places exposes the construction workers at risk of occupational injuries (Meo, Alsaaran, Alshehri, Khashougji, Almeterk, Almutairi & Alsaeed 2013:1394). Consequently, psychosocial hazards lead to work-related stress (ILO 2016:11).

2.5.2 Hazard identification and control on the construction sites

Hazard identification and control is the first component in risk management (Elsayegh 2008:431) and an important aspect in maintaining a safe working practice and environment (Perlman, Sacks & Barak 2014:22). However, a majority of construction workers lack the awareness of OHS aspects, such as hazard identification and practicing safe working practices, which assist in the prevention of occupational hazards, accidents, diseases and fatalities at workplaces (Mwanaumo & Thwala 2012:12). Perlman et al (2014:22) study which assesses hazard recognition skills and risk perceptions among superintendents in Israel's construction industry shows that some construction superintendents were unable to identify all hazards in the construction sites.

An exploratory study was also conducted by Mwanaumo and Thwala (2012:12) among construction practitioners in Gaborone, Botswana. The study reports that many construction practitioners in Botswana were not aware of the construction work hazards, hazard operations and hazard prevention. The same study also found out that construction workers lack knowledge pertaining to occupational hazards and disease prevention (Mwanaumo & Thwala 2012:16). The study states further that the lack of awareness on OHS, such as occupational hazards, exposure risks and preventive measure, makes construction workers vulnerable to occupational hazard exposures and occupational diseases due to their low awareness of OHS at work (Mwanaumo & Thwala 2012:16).

Zhao, McCoy, Kleiner and Smith-Jackson (2015:143) highlight the importance of hazard controls and complete removal of hazards in order to prevent injuries and accidents in the construction industry. However, a failure to engage in a complete hazard removal or control should be met with introduction of administrative controls such as training, supervision and job rotation as this promotes best safety practices that limit workers' exposures to hazards (Chinniah 2015:169).

2.6 LITERATURE REVIEW FINDINGS REGARDING OCCUPATIONAL ACCIDENTS IN THE CONSTRUCTION INDUSTRY

2.6.1 Occupational accidents in the construction industry

OHS has been a concern globally due to the risk of accidents occurring at work on a daily basis (Phoya 2012:29). About 2,3 million people worldwide die each year as a result of occupational accidents and work-related illnesses or injuries (ILO 2014 a:1). This causes a social and economic burden for sectors, communities and countries, as well as the financial suffering of the affected workers and their families (ILO 2014b:1). Nevertheless, measures have been placed to prevent, control and eliminate occupational accidents, yet occupational accidents are still significantly higher (Alli 2008:3).

The ILO statistics indicate that more than 330 million work-related accidents occur worldwide on an annual basis due to unsafe or unhealthy workplace conditions. This causes a loss of 4 to 10% of the global GDP (ILO 2012:3). It is also observed that at least 108 000 construction workers are killed at work places annually due to global OHS conditions (Gürcanli & Müngen 2013:581). Furthermore, 33.5% of the 2011 fatal accidents reported in Turkey were in the construction industry, a condition that was higher than the other nation's industries (Gürcanli & Müngen 2013:581).

Therefore, compromising workers' quality of life, occupational accidents and fatalities from the construction industries have detrimental effects such as a compromise to the economy of the country (Jaffar et al 2011:92) and a loss of public capital due to the payment of compensation for on duty injuries (Liao & Chiang 2015:363). The situation is worse in the developing countries as there are high incidences of occupational accidents there than in developed counties (Irumba 2014:109).

2.6.2 Literature findings on sources of occupational accidents in the construction industry

Heinrich (1936) studied the causes of accidents and introduced the domino theory after investigating 75,000 industry accident reports (Oswald, Smith & Sherratt 2015:1789). According to Heinrich (1936), there are five sequential dominos which form a chain that contributes to an accident or injury and these include: ancestry and social environment, fault of a person, unsafe act and mechanical or physical hazards (Chi & Han 2013:1027). In addition, Heinrich (1936) states that 88 percent of the accidents are caused by workers' unsafe acts (Swuste, Van Glujik & Zwaard 2010:1008). Heinrich (1936) also recommends that social and organisational support such as safety training and the elimination of unsafe acts and unsafe conditions can be used to reduce accidents and injuries. Furthermore, environmental factors, such as workplaces hazards and personal factors including knowledge, attitude and skills, contribute to occupational accidents (Ngamthampunpol 2008:12).

Bad management, poor working environment and unsafe working procedures and risky personal factors of workers are listed as sources of construction sites accidents (Irumba 2014:110). Concurrently, Eppenberg and Haupt's (2009:6) evaluation in the Western Cape region's construction workers' injuries indicate that a majority of injured construction workers were younger and aged less than 40 years. Both authors argued further that demographic factors, such as age, can affect workers' risk of sustaining accidents or injuries at workplaces.

Occupational accidents can also be caused by defective or inadequate equipment, noisy working environments, negligence among workers or inadequate safety training of workers (Zin & Ismail 2012:742). It is, therefore, of utmost importance to inspect work equipment and replace the defective, ensure noise in the work environment is minimised and provide adequate lighting and ventilation to prevent accidents (Li & Poon 2009:15).

Another factor responsible for work-related accidents is poor communication (Pinto et al 2011:617). Communication barriers, such as communication deficiency and low education level contribute to occupational accidents and injuries (Sousa, Almeida & Dias 2014:76). Saiman (2010:3) also reports that lack of knowledge or training regarding OHS at work, poor supervision, and unsafe acts by workers, carelessness and ignorance, contribute to higher accident rates in the construction industry. A study by Ghani, Hamid, Zain, Rahman, Kamar and Rahman (2010:1) focusing on the Malaysia construction sites, found out that unsafe procedures, unsafe methods, lack of knowledge and negligence are the largest contributors to accidents and injuries. Furthermore, Phoya (2012:72) indicates that most of the occupational injuries in the Tanzania construction industry are caused by falls due to loss of balance as a result of workers being overweight. Poor visibility also predisposes workers to occupational accidents and injuries (Hinze & Teizer 2011:710).

A study by Gϋrcanli and Müngen (2013:581) that analyses the construction industry's accidents in Turkey from 1972 to 2008 reveals that falls accounted for 54.1%, struck by thrown/falling objects at 12.9%, collapse of the structure accounting for 9.9%, while electrocution accounted for 7.5% of the accidents. Further causes of occupational injuries were found as being struck by falling objects (49.9%), striking against objects (14.8%) and falls on different levels at 11.2% (Eppenberger & Haupt 2009:10).

A study conducted in Massachusetts among Hispanic construction workers indicates that most of the accidents were caused by pressure from the supervisors demanding employees to work fast so that projects can be completed ahead of schedule and in that way the supervisors could get bonuses. Furthermore, a lack of proper equipment to prevent falls, lack of PPE provisions, illiteracy which prevented the workers from reading safety instructions and lack of safety trainings, were cited as causes of occupational injuries (Roelofs, Sprague-Martinez, Brunette & Lenore Azaroff 2011:4). Therefore, it is important to understand how occupational accidents are generated in order to prevent accidents, minimise the accident sources and improve workplace safety (Chi & Han 2013:1037).

2.6.3 Common occupational accidents in the construction sites

Several authors report common accidents in construction industry that arise from falls from above or falls at the same level struck by moving objects, slip trips, accidents caused by machineries and those caused by fire (Kaskutas, Dale, Lipscomb, Gaal, Fuchs, Evanoff, Faucette, Gillen & Deych 2010b:259; Phoya 2012:32). These common occupational accidents are explained below:

- **Fall from above**

Falling from heights is a very common accident on construction sites globally (Fass, Yousef, Liginlain & Vyas 2016: 4) which contributes to one third of fatalities (Phoya 2012:32). Fatalities due to falls amounted to 37% in the United States of America's construction industries in 2007 (Kaskutas et al 2010 b:259). A study by Cheng et al

(2012:66) which explores the factors contributing to injuries in the construction industries in Taiwan states that falls cause 47% of the injuries followed by object collapses at 19%, while injury from falling objects amount to only 5% of the accidents. Similary, the United Kingdom reported that 37% of the major injuries were caused by falls from height related accidents in 2014 and this was more than other causes of injuries (Health and Safety Executive 2014:9). It should be underscored that most of these falls are due to workers' non-use of Personal Protective Equipment (PPE) such as safety harnesses and safety nets (Zin & Ismail 2012:747).

In addition, the findings of a study conducted by Hallowell (2008:128) in the USA indicate that many construction workers perceived falling from heights and manual handling as common accidents in the construction industry. Findings from a cross sectional study in carried out by Kaskutas et al (2010a:221) in St Luis to identify factors contributing to falls among carpenters reveal that 16% of the participants had fallen, with falls from the ladder as the most common. Therefore, Kaskutas et al (2010a:227) recommended that training on fall prevention should be strengthened.

A total of 14% of the 2010 fatal work injuries in the USA were related to falls (Bureau of Labour Statistics, United States Department of Labour 2011:3). However, the use of PPE such as safety harness can prevent falls and video presentation on fall prevention is also an effective mode of fall prevention training (Miller 2012:15). It was also highlighted that instruction on fall prevention and mentoring at work contributes positively to fall prevention (Kaskutas et al 2010a:226).

The construction workers' failure to use personal protective equipment (PPE) at all times when performing work was identified as a major contributing factor to falls in the construction industry (Irumba 2014:110). Construction workers provide reasons such as forgetfulness, PPE not provided or PPE not comfortable (Muiruri & Mulinge 2014:9), but still it is clear that lack of PPE use may lead to workers falling if they slip trip (Othman 2009:36). This was similar to the finding from Hamid, Majid and Singh's (2008:242) study on the causes of accidents in the construction industry. The study results reveal that most of the accidents were caused by workers' negligence, incorrect work procedures such as short cuts, the nature of work being performed such as working at heights, using equipment without safety devices or old safety devices, poor site management such as lack of risk assessment before procedures, lack of workers' knowledge and skills, and negative attitudes held by some workers. Gürcanli and Müngen's (2013:585) analysis of construction accidents in Turkey also found out that falls accounted for 54.1% of the accidents followed by sticking from thrown/falling objects which rated at (12.9%).

Furthermore, Kaskutas et al (2010:224) conducted a study among apprentice carpenters in the USA to identify factors associated with falls from heights. The findings show that many participants had a poor knowledge of fall prevention. As a result, 51% of the respondents have seen someone fall at work while 16% of the respondents have fallen themselves during working in the construction sites.

- **Slips and trips-related accidents**

Slips and trips are a common accident in the construction industry and contribute to 30% of falls from above and 85% of falls from the same level globally (Lipscomb, Cameron & Silverstein 2008:474; Phoya 2012:32). In fact, slips and trips are mostly caused by poor housekeeping such as wet or greasy floors and big or foot wear without prints (Phoya 2012:32). The Health and Safety Executive (2012:9) statistics reflect that slips and trips accounted for 40% of the reported accidents in the UK during the 2011/2012 financial year. Furthermore, slip trips contributed 2% to the 2013 fatal occupational injuries in the UK's construction industry and the slip trips were the second cause of major injuries at 27% after falls from heights which accounted for 31% in 2013 (HSE 2014:9).

Slip trips were identified as the causes of 30% of the falls in the USA in a study on apprentice carpenters by Kaskutas et al (2010:224). Slips and trips were also stated as a major cause of machinery injuries. Many workers enter machinery danger zones after slip trips and thus exposing themselves to the risk of sustaining machinery injuries (Aneziris, Papazoglou, Konstandinidal, Baksteen, Mud, Damen, Bellamy & Oh 2013:386). However, Bollo (2011:95) points out, in contrast to the above observations that, slips and trips are not the major causes of accidents, and argues further that alcohol, drugs, stress and HIV/AIDS are the current leading major causes of accidents and fatalities in the construction industry.

- **Being struck by moving vehicles and related accidents**

Being struck by moving vehicles, which causes fractures, other injuries and fatalities, is also a common accident in the construction industry (Phoya 2012:32). Most of the construction vehicle accidents are caused by reversing vehicles, driver failure to see where they are steering to due to a trucks back up and the use of cellular phones or two way radios which distracts the driver (Hinze & Teizer 2011:710). The UK statistics show that the cases of construction workers struck by moving vehicles amounted to 10% in 2012 and yet car-on-worker accidents in all other industries amounted to 15% (HSE 2013b:8). This shows a higher probability of being struck by moving vehicles in construction than in any other industry. However, there was a decrease in fatal injuries caused by struck by moving vehicles to 7% in 2013 (HSE 2014:8).

Hinze and Teizer (2011:719) investigated the visibility of fatalities related to construction vehicles and equipment in the USA. The study found out that blind spots and obstructions contributed mostly to vision-related fatalities. Hinze and Teizer (2011) also recommend that all trucks and mobile construction vehicles should have audible back up alarms installed and these should be activated when the vehicle is reversing (Hinze & Teizer 2011:710).

- **Equipment and machinery-related accidents**

Workplace machines and equipment contain hazards of a different nature and exposure to the hazards can result in accidents, injuries or fatalities (Chinniah 2015:163). Construction workers are at risk of accidents or injuries from the moving parts of machines while performing work (Aneziris et al 2013:382; Phoya 2012:32). Furthermore, Jocelyn, Chinniah and Ouali (2016:64) assert that lack of safeguarding, by passing safeguards, absence of lockout procedures during maintenance, lack of training, inexperienced operators and lack of risk assessment all contribute to machinery-related accidents. Meanwhile, severe injuries, such as amputations and the resultant permanent disability of a workers, occurs in the construction industry due to equipment and machinery accidents (Aneziris et al 2013:382).

The USA Bureau of Labor Statistics data reports that 464 occupational fatalities occurred in the USA between 1966 and 1998 and these were caused by workers caught in running machinery, with 717 fatal work injuries occurring as a result of accidental contact with objects and equipment in 2013 (Chinniah 2015:163). A study by Aneziris et al (2013:384) indicates that cranes are the most dangerous equipment on the construction sites, especially when operated by unqualified persons. In addition, (Aneziris et al (2013:384) noted that cranes were overused in some construction sites which poses a challenge as an overuse of equipment may lead to unsafe working practices or workers rushing to finish the job.

Similarly, a study conducted by Sertyesilisik, Tunstall and McLouglin (2010:76) in the UK reveals that there was an increase in the occurrences of lifting equipment-related accidents on the construction sites due to the poor planning of lifting operations, poor training and poor equipment selection. Gürcanlı, Baradan and Uzun (2015:64) investigated the risk perception of construction equipment operators on Turkey's construction sites. The study found out that exhausted machinery operators contribute to machinery-related accidents as a majority of the operators indicated that they worked for more than 8 hours a day. Furthermore, participants stated that OHS training and working with an assistant, such as a flagger, contribute to the reduction of accidents-related to construction equipment.

In order to prevent accidents caused by machines or equipment the manufacturers should provide instructions on how to use equipment and machineries while the employers should ensure that workers are trained on how to use that equipment (Hughes & Ferret 2005:177). Furthermore, the management should ensure that enough equipment is supplied, maintained and safeguarded (Chinniah 2015:169) as these have an impact on equipment safety (Törner & Pousette 2009:404). According to the International Standard Organization (ISO) 12100 (2010) risk assessments should be conducted to prevent the occurrence of accidents. The standard (ISO 12100) states further that the machinery equipment designers should inherently design machinery that are safe and safeguarding by installing guards or protective devices and providing usage instruction to the clients (Jocelyn et al 2016:66).

- **Literature findings on struck-by-falling-objects accidents**

Struck by falling objects is stated by Lipscomb, Schoenfisch and Shishlov (2010:192) as the most common cause of accidents in a study conducted on nonfatal contact injuries among USA construction workers. However, a study by Cheng et al (2012:217) which investigated the data on factors contributing to occupational injuries in Taiwan's construction industry found, to the contrary that, falling was the major cause of accidents, while being struck by falling objects accounted for only 5% of the accidents. Similarly, Gürcanli and Müngen's (2013:584) study on the Turkish construction industry shows that struck by falling objects accidents ranked as the second common cause of accidents and only contributed to 12.9% of the accidents.

- **Literature findings on electrocution-related accidents**

Occupational accidents due to electrocution in the construction industry are disproportionate globally (Zhao et al 2015:150). In addition, electrocution is one of the common causes of accidents in the construction industry and ranking as the fourth leading source of occupational fatality (Janicak 2008:617). The most common cause of electrocution accidents in the USA from 1992-1995is contact with overhead power line at 47.2%, followed by contact with wiring transformers or other electrical components at 34.3% as indicated by Janicak (2008:618).

- **Literature findings on motor vehicle crashes related accidents**

Motor vehicle crashes are one of the common causes of accidents in the construction industry. Al-Thani et al (2015:1807) conducted a study on the epidemiology of occupational injuries by nationality in Qatar, which shows that motor vehicle crashes were the most common among Indian and Nepalese workers.

In support, a study by Fass et al (2016:4) focusing on the causes of fall and struck by incidents in the Arabian Gulf region found out that overturned vehicle accidents rank second after common medical emergencies due to cardiovascular, respiratory or gastrointestinal incidents. In addition, Gürcanli, Müngen and Akad (2008:378) investigated on injuries related to construction equipment and motor vehicles in the Turkish construction industry, with the study revealing that motor vehicle accidents ranked fourth after falls, electrocution, and accidents related to being struck by falling objects.

- **Literature findings on trench burying related accidents**

Trench burying is also reported as a common cause of accidents in the construction industry (Lipscomb et al 2010:191; Gürcanli & Müngen 2013:589). Trenches are mostly excavated in the construction industry for the installation or replacement of pipes (Pesantes-Tavares 2011:45). According to OSHA, cited in Pesantes-Tavares 2011:45), the protection of construction workers can be attained by shoring or sloping the trench wall or using the trench shield to prevent trench burying accidents. Furthermore, the trenchless method could be used with more advantages than trenches (Pesantes-Tavares 2011:45).

2.7 LITERATURE REVIEW FINDINGS REGARDING OCCUPATIONAL INJURIES IN THE CONSTRUCTION INDUSTRY

The construction industry is regarded as a high-risk one due to higher statistics of occupational injuries, making it necessary to investigate the factors that influence injuries in the construction industry in order to seek solutions on how to protect workers from occupational injuries (Abbe, Harvey, Ikuma, & Aghazadeh 2011:107). As indicated by Hallowel (2008:12), occupational injuries are three times higher on the construction sites than at sites from other sectors. However, Alli (2008:3) argues that injuries due to occupational accidents are the fourth main causes of work-related fatalities globally in all occupations.

Reports from the United Kingdom show that the construction injuries accounted for 27% of fatal injuries to workers, 10% of major injuries and were responsible for 7% of absenteeism from work in 2011/2012 (Health and Safety Executive 2013b:6). These injuries also result in financial difficulties for the injured individual employees (Health and Safety Executive 2013b:6). In addition, occupational injuries in Poland’s construction industry accounted for 9.17 people per 1000 workers in 2012, a figure that is higher when comparing with the statistics of other industries which were at 7.78 injuries per 1000 workers (Hóla & Szóstak 2014:429).

Hallowell (2008:12) states that injuries related to the construction industry are unique to the place and type of work being performed as well as the age and context of the worker. As a result, the review of literatures proves that negative safety culture, substance abuse, the level of education, language barriers, age above 55 years old, and long working hours contribute mostly to work-related accidents and injuries (Salmien 2004:1).

Work experience also determines the risk of acquiring work-related injuries. The findings from literature reveal that workers with less than one year working experience are more prone to sustain work-related injuries (Chia-Fen, Chang, Tin-Chang & Hsin-I 2005:391) while workers who possess more than a year of experience are less likely to sustain serious injuries, probably because they are either trained in OHS or would be benefiting from the work experience acquired over the years (Arquillos et al 2012:384). This shows that worker education on occupational related hazards can make workers aware of possible work accidents and hazards and assist the same workers on how to prevent the hazards, which leads to occupational injuries prevention.

Further findings from the review of literature reveal that the employers' prioritisation on productivity exposes employees to long working hours, stress and poor concentration (Siu, Phillips & Leung 2004:359), hence a high risk for occupational injuries. The promotion of a culture of safety at work has the potential of preventing workers' negative attitudes towards safety (Hallowell 2008:38). Hence, some of the literature advocates for managers to ensure that health and safety measures are in place to prevent occupational injuries (Cheng et al 2012:221).

An analysis of the 2006 to 2009 documents from the Ilam Bureau for Labour and Social Affairs in Iran by Moradianazar, Kurd, Farhadi, Amee & Najafi (2013:1) shows that annual incident rates of occupational injuries were 8.2 per 1 000 workers. The study shows further that 36% of the injuries were caused by slip and falls, while 71% of workers sustained fractures as a result of falls or slips (Moradianazar, Kurd, Farhadi, Amee & Najafi 2013:1). The study concluded that a lack of risk assessment in the construction industry is a contributing factor to the prevalence of occupational injuries (Moradianazar et al 2013:3).

On the contrary, workers' focusing on job security does not raise OHS concerns just as their ignorance of responsibilities toward the promotion of their own health and safety at work is a contributory factor towards work-related accidents and injuries (Village & Osty 2010:776). Furthermore, construction workers' attitudes towards OHS influences the frequency and severity of injuries (Sousa et al 2014:76).

2.7.1 Gender distribution of injured workers in the construction industry

Studies have shown that males are mostly involved in construction industry injuries (Cheng et al 2012:218). Lipscomb et al (2010:192) conducted a study that analyses nonfatal injuries among construction workers treated in the USA emergency departments during the 1998-2005 period and the results show that the treated injuries were significantly high among men than women. In addition, Kim, Dutra and Okechukwu's (2014:497) assessment of the safety practice in association with musculoskeletal pain and injury-related absence among construction apprentice reveals that, males constituted the majority of injured construction workers.

2.7.2 Literature findings on the age distribution of injured workers

Age affects the injury rate and determine the severity of injuries. The reality is that injury rates are higher in young than order workers while older workers are at risk of sustaining fatal injuries (Arquillos et al 2012:381). In this case young workers refer to the workers aged less than 40 years and those aged 40 years and above are regarded as older workers. A study by Lipscomb et al (2010:193) analysing nonfatal contact injuries on construction workers treated in the USA's emergency department during a period of 8 years confirms the significance of age in the distribution of accidents in its finding that the injury rate was higher among young workers.

Eppenberger and Haupt (2009:9) conducted a study in the Western Cape Province of South Africa, which found out that a majority 68.7% of the injured workers were younger than 40 years. In support, a study by Cheng et al (2012:217) on Taiwan's construction industry reveals that a majority 32% of the injured workers were aged between 35 and 44 years and these were followed by those in the 25-34 years age range. In addition, Choi's (2015:152) study on injuries in the UK's construction industry found out that construction workers aged 35-44 years sustained the highest injuries.

On the contrary, an assessment on the injuries among construction apprentices by Kim et al (2014:497) shows that a majority of the injured workers were under 35 years. Furthermore, a study conducted by Rahman et al (2013:161) found out that a majority of the injured workers were 36 years old.

2.7.3 Literature findings on injured construction worker's occupation

In the study by Eppenberger and Haupt (2009:9) labourers were mostly injured as their cases amounted to 81.2%. This observation is also confirmed in Choi's (2015:153) study on aging workers and trade-related injuries in the USA's construction industry, which shows that the job categories which sustained most injuries were labourers followed by carpenters.

2.7.4 Literature findings on the nature of injuries among construction workers

A majority of the construction workers injured in the US during the1998-2005 period had lacerations (Lipscomb et al 2010:192). This is also confirmed by Arquillos et al (2012:386) in their study, on occupational accidents in Spain, which states that wounds such as superficial injuries were commonly sustained by construction workers. In the same way, superficial wound injuries were found common in young workers and older workers in the South African construction industry (Eppenberger & Haupt 2009:11).

Furthermore, injuries such as fractures, strains and eye injuries are higher among construction workers (Cassiem 2009:7). However, sprain and strains were reported as the most common injury in the USA's construction industry (Choi 2015:152). It should be underscored that poor reporting on occupational accidents and injuries is a global challenge (Lopes, Haupt & Fester 2011:9). Therefore, the occupational health and safety conditions of the construction industry are a challenge that needs to be addressed.

2.7.5 Literature findings on the construction worker's injured parts of the body

The most common part of the body which sustained injuries in the construction industry were found to be fingers, arms and wrists (Choi 2013:152; Lipscomb et al 2010:193). Eppenberger and Haupt (2009:12) also note that the construction worker's body part commonly injured are fingers.

2.8 PREVALENCE OF OCCUPATIONAL ACCIDENTS, INJURIES AND FATALITIES IN THE NAMIBIAN CONSTRUCTION INDUSTRY

The construction industry in Namibia is characterised by an increase in occupational accidents, injuries and fatalities and a poor reporting mechanism on these (Ministry of Labour and Social Welfare of Namibia 2014:5). According to the annual statistics from the Ministry of Labour and Social Welfare, the construction industry is challenged by injuries, accidents and fatalities. Table 2.1 shows the occupational injury statistics in the construction industry provided by the Ministry of Labour and Social Welfare of Namibia. A major injury means an accident that results in absence from work for more than three days, while a minor one refers to a wound sustained at work that does not disrupt working days or only results in an employee’s absence for less than three days (ILO 2012:7). Fatality injuries include all workplace sustained accidents that result in the death of the person up to 30 days after the accident (ILO 2012:7). The statistics show an injury increase from 18 cases in 2010/2011 to 30 during the of 2011/2012 period. Surprisingly, there was a slight decrease in 2012/2013 with 16 cases. However, 2013/2014 witnessed a peak of 32 cases and there were 30 injuries in 2014/2015 in Namibia. The 2015/2016 period witnesses 8 cases of major injuries and 6 cases of fatal injuries in which 50% of the fatalities were from construction industry (Ministry of Labour, Industrial relations and Employment creationsof Namibia 2016:2). Therefore, construction industry fatalities remain higher in comparison with other industries.

Table 2.1 shows the proportions of occupational injuries and fatalities from the Namibian construction industry for the period 2010/2011-2015/2016 (Ministry of Labour, Industrial relations and Employment Creation Accidents Statistics).

Table 2.1 Proportions of occupational injuries and fatalities from the Namibian construction industry for the period 2010/2011-2015/2016

Year	Total number of construction workers	Major injury	Minor injury	Fatalities	Total cases	Percentages
2010/2011	20807	13	1	4	18	0.136
2011/2012	21934	14	10	6	30	0.136
2012/2013	42 577	9	3	4	16	0.037
2013/2014	47 859	26	0	6	32	0.066
2014/2015	No data	23	0	7	30	-
2015/2016	No data	8	0	6	14	-
Cumulative	133177	93	14	33	140	0.375

(Ministry of Labour, Industrial relations and Employment Creation Accidents Statistics 2016:1)

However, occupational accidents, injuries and disease in the construction industry remain challenging and increasing (Cesarin, Hall & Kupiek 2013:01). Thus, this perspective indicates that the construction industry's health and safety is a global concern, which needs to be improved through compliance with international occupational health and safety legal requirements.

2.9 LITERATURE REVIEW FINDINGS ON OCCUPATIONAL HEALTH PROBLEMS IN THE CONSTRUCTION INDUSTRY

According to the International Labour Organization (ILO), about 160 million workers in the world suffer from occupational diseases with the majority found in developing countries due to poor working conditions and lack of social protection (Abbas 2015:218). Occupational diseases lead to absenteeism, which leads to both loss of income for the workers and low productivity for the industry (Yoon, Lin, Chen, Yi, Choi & Rui 2013:202). Occupational diseases remain a burden globally (Meo et al 2013:1394). At times occupational diseases take longer to manifest which sometimes leads the affected workers to be diagnosed with an occupational disease after left employment (Pesarites-Tavares 2011:15). Furthermore, lack of awareness of occupational diseases among construction workers and the unavailability of medical professionals in the construction industry poses a challenge to reporting occupational diseases because construction sites management or construction workers are often unable to interpret the signs and symptoms of occupational related diseases (Mwanaumo & Thwala 2012:16).

2.9.1 Common health problems in the construction industry

The construction industry exposes workers to health risks which may cause construction workers to develop work-related health problems (Mwanaumo & Thwala 2012:12). A report by the Health and Safety Executive (2013b:6) indicate that vibration white finger, carpal tunnel syndrome, occupational deafness and dermatitis are the most common cases of non-lung diseases in the construction industry. Furthermore, other substances that cause occupational diseases in the construction industries include carcinogenic and teratogenic such as lead chromate, dichloromethane, asbestos and carbon monoxide from welding work (Montano 2014:4). As a result, compared to other industrial sectors, the construction industry has the largest number of occupational cancer due to exposures to asbestos and silica (Health and Safety Executive 2013a:7).

The most common health problems in developing countries, are deafness and musculoskeletal disorders, which are a result of exposure to hazards (ILO 2015:24). Therefore, governments should put up measures to ensure OHS compliances in order to prevent occupational related health problems (ILO 2015:24). The common health problems in the construction industry are discussed next.

2.9.1.1 Back pain

Back pain is one of the common types of musculoskeletal problems (MSDs) that affect construction workers (Alghadir & Anwer 2015:2) due to the physical demands of the job (Boschman et al 2012:2). A majority 70% of India’s women in the construction industry reported that they had chronic back pains (Baruah 2010:218).

Meo et al (2013:1395) conducted a study in Saudi Arabia to investigate occupational related MSDs among builders in the construction industry and found that, 20.1% of the respondents self-reported whole body fatigue while 16.5% indicated that they suffered from lower back pain. Moreover, 15.3% of the respondents have been in the construction industry for 3-6 years, while 22.4% indicated that they had worked in the construction industry for more than 6 years (Meo et al 2013:1395). These figures show increases in musculoskeletal diseases in workers who have worked in the construction industry for longer periods. Therefore, these authors concluded that musculoskeletal problems are linked with the duration of work.

A longitudinal study was conducted by Boschman et al (2012:1) among bricklayers and foremen in the Dutch construction industry to determine the prevalence of musculoskeletal disorders (MSDs) and the workers' perceptions on work-related symptoms and aggravating factors, with the study revealing the prevalence of MSDs at 67% for bricklayers and 57% for supervisors. Back pain and knee pain were reported mainly during the follow up after one year. Another study conducted by Pesarites-Tavares (2011:41) on construction workers in Florida reveals respondents' indications that back problems, hearing loss, skin and breathing problems were the most common occupational disease in the construction industry.

Meanwhile, construction workers, especially workers aged 40 to 50 years old, often suffer from back pain and other musculoskeletal problems than other workers in other industries (Pesarites-Tavares 2011:19; Smallwood & Ajayi 2009:23; Smallwood 2011:29-38). This claim is substantiated by the findings from a survey carried out in Cape Town, South Africa which reveals that back pain among workers in construction companies occurred at a rate 25% more than in the developed countries which leads to absenteeism and low productivity (Himalowa & Frantz 2012:28).

A study by Smallwood (2008:54) that determines South African architects' designer's perceptions and practices regarding construction ergonomics shows that building designers lack of knowledge and awareness of OHS in the construction industry contributes to occupational diseases such as back pain as most of designers were not trained on OHS during their tertiary education. In addition, the study realised the importance of architectural design pertaining to ergonomics in the construction industry. The study also recommends the inclusion of construction ergonomics in architectural designer tertiary education and advocates for the strengthening of continuing professional development (Smallwood 2008:54). The Smallwood (2008:54) recommend as concurs with the UK Construction Design and Management (CDM) regulations of 2007, which were promulgated to enforce the application and implementation of OHS during the planning and design of construction work (Zhou et al 2012:103).

2.9.1.2 Difficulty in breathing

Difficulties in breathing are a common problem in the construction industry due to exposure to different types of hazards such as chemicals and physical hazards (ILO 2014:5). Furthermore, respiratory-related diseases such as difficulty in breathing are mostly caused by silica dust at concrete work, sand blasting and grinding and from asbestos during demolition work (Pesarites-Tavares 2011:19). According to the HSE (2013a:7) difficulties in breathing in the construction industry are mostly caused by airborne materials such as spray painting, welding, cutting or grinding metals, cement, bricks and concrete. These difficulties arise mostly from a lack of preventive measures on non-use of protective clothes and respirators by workers (Fan, Wong, Shen, Lu, Wang, Yu & Shen 2012:1285).

Carino, Romita and Foti’s (2013:4) literature review on respiratory problems, such as asthma related to allergy and allergy related skin disorder among construction workers, also shows that occupational asthma was mostly caused by isocyanides, wood dust, resins, glues, chromium and cobalt. The study recommended medical surveillance and risk assessment in order to prevent such occupational diseases (Carino, Romita & Foti 2013:5).

2.9.1.3 Skin problem

Skin disease, respiratory conditions and musculoskeletal diseases are common in construction industries (Akram 2014:102). Skin diseases were reported as the most common health problem affecting USA’s construction workers, such as concrete workers, brick layers, plasters, painters, cleaners and insulators, as they are always in contact with harmful substances (Pesantes-Tavares 2011:21). This is, however, contradictory to Akram (2014:102) who states that skin problems in the construction industry affect labourers than any other occupation categories. Furthermore, allergic contact dermatitis is mostly caused by exposure to sensitising agents which cause the immune system to react (Carino et al 2013:4). Meanwhile, continuous contact of skin with dust also contributes to skin problems such as dermatitis. Therefore, construction workers should be advised to wear personal protective cloths to avoid direct contact with harmful substances or dust (Pesantes-Tavares 2011:42).

2.9.1.4 Difficulties in hearing

Hearing impairment is one of the common health problem among construction workers due to higher prevalence of noise exposure (Leensen et al 2011:577). About 120 million people worldwide have hearing difficulties (ILO cited in Steenkamp 2008:44). Furthermore, about 12-15% of workers in developed countries, such as German and other European countries, are exposed to noise of 85dB or above which can lead to hearing difficulties (Steenkamp 2008:44) However, many workers do not wear hearing protection devices deliberately (Steenkamp 2008:43). Nevertheless, Li et al (2016:722) argue that PPE for hearing protection are not always provided, thus, putting the construction workers at risk of developing hearing difficulties. A study conducted by Muema et al (2015:79) to assess the construction workers' awareness of occupational hazards, illness and injuries associated with construction industry in Mombasa, Kenya, found out that 3.3% of construction workers had hearing impairments.

2.9.2 Provision of medical surveillance in the construction industry

Medical surveillance involves an assessment of workers' health through means such as biological monitoring, questionnaires and medical examinations, in order to detect or identify abnormalities and potential hazards exposure (Alli 2008:65).

Failure by the employer to conduct medical surveillances periodically on workers causes delayed detection and reporting on occupational diseases (Meo et al 2013:1395). It is therefore important that pre-employment screening be conducted to prevent potential employees with chronic non-occupational illness from causing injuries to other workers (Gouttebarge, Van der Molen, Frings-Dresen & Sluiter 2014:166). Therefore, medical surveillance should be conducted in order to detect pre-employment clinical abnormalities and diagnose occupational disease or any other deviations from health (Boschman et al 2013b:1). However, Mwanaumo and Thwala (2012:16) stated that it was revealed that some employers avoid medical surveillance as they think many workers will be unfit for the job and that they would lose them, while some workers insist on not knowing their health status due to fear of discrimination .

2.9.3 Occupational diseases in the Namibia construction industry

The National Occupational Health Policy of Namibia (2006:28) lists 34 types of occupational diseases, which must be reported to the Chief Medical Officer of the Occupational Health and Safety Department upon diagnosis (Ministry of Health and Social Services of Namibia 2006:20). Workers with occupational diseases are compensated under the Employees Compensation Amendment Act, 1995 (Republic of Namibia 1995) through the Social Security Commission. Occupational diseases are not consistently reported in Namibia, because of the existing staff shortages mean that occupational health and safety is not decentralised to the regions across the country (Ministry of Health and Social Services 2014:7), thus hampering service provision.

As much as the ILO requires that employers should provide OHS to the employees, there is little effort by the construction industries in Namibia to meet the set criteria. Therefore, the situation is characterised by an absence of annual reports on occupational-related diseases due to human resources challenges with regard to the enforcement of the OHS legislation (Ministry of Health and Social Services of Namibia 2013:4).

2.10 LITERATURE REVIEW FINDINGS REGARDING OCCUPATIONAL HEALTH AND SAFETY LEGISLATION PROVISION IN THE CONSTRUCTION INDUSTRY

Occupational health and safety has been a global concern due to the risk of injuries and accidents occurring at work daily (Phoya 2012:29) and the associated social and economic burden for sectors, communities and countries, as well as financial suffering for workers and their families (ILO 2014b:1). Thus the health and safety of the construction industry needs to be improved globally through compliance with international and local occupational health and safety legal requirement described hereafter (Raheem & Issa 2016:301).

2.10.1 Global Occupational Health and Safety legal requirements

The International Labour Organization (ILO) set up international standards such as conventions that should be ratified by all member states, including Namibia, in an attempt at maintaining health and safety of all workers at workplaces (ILO 2013:81). However, Namibia has not yet ratified any of these conventions thus lacks OHS enforcement which are hampering the OHS of workers in the construction industry.

2.10.1.1 International Labour Organization (ILO) standards on occupational health and safety

The realisation of a threat to the occupational safety and health of the employees led to the establishment of the ILO in 1919 to promote health and safety for the employees, facilitate social protection and demand employers' accountability for the well-being of the employees (Geminiani 2008:17). Namibia has been a member of ILO since 1978 and is expected to the ILO's prescription that each member state must establish a national occupational health and safety policy which advocates for the adherence to the provisions of the convention for the prevention of occupational related injuries, fatalities and diseases (ILO 2006:1). However, Namibia has not yet ratified the convention, described below, which advocates for occupational health and safety.

2.10.1.2 Convention 155 of 1981 (Occupational Health and Safety Convention)

The Convention 155 of 1981 (Occupational Health and Safety Convention) advocates for the prevention of occupational related injuries, fatalities and diseases (International Labour Organization 2006:1). The convention provides for the adoption of a coherent national occupational safety and health policy, and advice on action to be taken by governments and organisations to promote occupational safety and health and to improve the workers' employment conditions by preventing occupational accidents and diseases (ILO 1981:article 4). This national occupational safety and health policy should consider the context of each country (ILO 1981:article 4). Furthermore, member states that have ratified this convention should ensure the establishment and review of the requirements and procedures for the recording and notification of occupational accidents and diseases, and for the publication of annual statistics (ILO 1981:article 11).

2.10.1.3 ILO Convention 167 of 1988 (Safety and Health in Construction Convention)

The ILO Convention 167 of 1988 (Safety and Health in Construction Convention) states the legal requirements that should be practiced by member countries to ensure the health and safety of workers in the construction industry (ILO 1988:article 1). The convention encourages an assessment of the occupational safety and health hazards, and the adoption and enforcement of relevant laws and regulations which ensure the application of the provisions of the convention (ILO 1988:article 7). In addition, the convention advocates for the co-operation between employers and workers so that safety and health at construction sites can be promoted (ILO 1988:article 6).

The convention states further the health and safety responsibilities at construction sites when there is a principal contractor and sub-contractors. Thus, the principal contractor should have an overall primary responsibility to ensure that all contractors are complying with the national laws and regulations to ensure the health and safety of all workers at construction sites (ILO 1988:article 8). This convention states the right of workers in promoting occupational health and safety by participating in the adoption of safe working procedures and through proper use of equipment to prevent accidents (ILO 1988:article 10).

However, Namibia has not yet ratified the Safety and Health requirements stipulated in the construction convention, (ILO Convention 167 No 167 of 1988). Moreover, there is a paucity of data regarding OHS in the construction industry in Namibia. Therefore, occupational health and safety challenges still exist in the Namibian construction industry.

2.10.1.4 Occupational Health Services Convention, 1985 (No 161)

This convention provides for the establishment of occupational health services to advice the employers, workers and their representatives in the enterprise on maintaining a safe and healthy working environment in order to prevent work-related health and safety problems (ILO 1985:article 1).

2.10.1.5 Promotional Framework for the Occupational Safety and Health Convention, 2006 (No 187)

This convention aims at promoting a continuous preventative safety and health culture in order to achieve a safe and healthy working environment (ILO 2006:article 2). It requires ratifying states to develop a national policy, national system, and national programme on occupational safety and health in consultation with the workers unions (ILO 2006:article 2).

The national systems shall ensure the implementation and compliance with the occupational health and safety national policy and programmes, such as laws and regulations (ILO 2006:article 4). National programmes should be measurable and indicate the time frame so that programs success or failure could be measured (article 5). Namibia has a national policy on occupational health, and yet there is no evidence on the implementation of this national policy, especially in the construction industry.

2.10.1.6 Working Environment (air pollution, noise and vibration) Convention, 1977 (No 148)

The convention provides that, the working environment shall be kept free from any hazards due to air pollution, noise or vibration (ILO 1977:article 3). To achieve this, technical measures shall be applied to working environments, and where this is not possible, supplementary measures regarding the organisation of work shall be taken (ILO 1977:article 4).

2.10.1.7 Chemical Convention 1990 (No 170)

The Convention provides for the adoption and implementation of a coherent policy on safety in the use of chemicals at work, which includes the production, handling, storage, exposure limit, transporting of chemicals and the disposal and treatment of waste chemicals (ILO 1990:article 2). The convention also covers the release of chemicals resulting from work activities, and the maintenance, repair and cleaning of equipment and containers of chemicals (ILO 1990:article 13). In addition, it allocates specific responsibilities to suppliers and exporting states (ILO 1990:article 9). However, the provision of chemical legislations in Namibia is very limited.

2.10.2 Occupational health and safety legislations in Namibia

A legislation framework regulates employers and workers by stating the required status, setting up the rules and regulations, and imposing punishment in case of a breach of regulations (Geminiani & Smallwood 2008:12). However, legislations are only useful when they are being followed and adhered to. Therefore, the management of a construction site adheres to the legislation by enforcing OHS to ensure protection at their worksites and prevent injury (Geminiani & Smallwood 2008:12).

Namibia is still in the category of developing countries that lack an OHS framework development, provision and implementation (Endroyo, Yuwono, Mardapi & Soenarto et al 2015:83). Developing countries are also known for having outdated legislations regarding OHS and lack statutory requirements (Mwanaumo & Thwala 2012:14). Therefore, occupational health and safety in the construction industries can be informed by a relevant legal framework which advocates for a safe working environment and promotes the well-being of the workers (Republic of Namibia 1997:488).

The Ministry of Labour, Industrial relations and Employment creation (formerly known as Ministry of Labour and Social Welfare till March 2015) is the custodian of OHS in Namibia, while the Ministry of Health and Social Services, Ministry of Mines and Energy, Ministry of Environment and Tourism, and the Ministry of Work, Transport and Communication, also play a major role in strengthening OHS in Namibia (Ministry of Labour and Social Welfare of Namibia 2011:22). The national OHS legislative laws which are currently applied in Namibia construction sites are described as follows:

2.10.2.1 Constitution of the Republic of Namibia

The National Assembly of Namibia drew up a national constitution that consists of laws that govern the country and maintain law and order. These laws stipulate how people in the country should behave and what happens if someone breaks the laws or order (Republic of Namibia 2010:27). Furthermore, the constitution sets out the rights of every citizen of the country (Republic of Namibia 2010:5).

The Namibia constitution advocates, with regard to occupational health and safety article five (5) that, all Namibians have equal human rights and dignity that include the right to safety at work (Republic of Namibia 2010:7). At the same time, article 15 of the constitution prohibits both the employment of children younger than 16 years old and their working in hazardous environments, just as it prohibits children who are less than 14 years from working in factories or mines (Republic of Namibia 2010:13). Furthermore, Article 95 advocates for the adoption of welfare programmes at worksites in order to promote the health and safety of the employees (Republic of Namibia 2010:50).

2.10.2.2 Labour Act (Act No 11 of 2007)

The Namibian Labour Act (Act No 11) of 2007 was promulgated to ensure the health, safety and welfare of employees in the workplace (Republic of Namibia 2007b:2). In addition, the act (Labour Act No 11 2007) seeks to ensure the health, welfare and safety of employees at work as noted in the description of the duties expected of employers toward employees as described hereafter (Republic of Namibia 2007b:47).

Employers must provide a working environment that is safe, without risk to the health of employees and provides with sanitary facilities. Furthermore, employees should ensure the provision of machinery, PPE and train workers on the safe usage of working equipment as well as the safe handling, storage and transportation of substances such as chemicals. Employers are also expected to provide and maintain safe entries into and exits from places of work as well as a good organisation of work including working hours and break times. The act states further employer responsibilities such as reporting accidents or diseases occurring at the place of work to a labour inspector. The employer is required to conduct business operations on its premises in a manner that is reasonably practicable and makes sure that persons who are not employees of that employer are not exposed to any risks or health hazards (Republic of Namibia 2007b:47).

The Act also underscores that employees have a right to leave a dangerous work place if they have a reasonable cause to believe that it is dangerous until effective measures have been taken make the work place safe and healthy to continue work (Republic of Namibia 2007b:47).

Section 43 of the Namibia Labour Act (Republic of Namibia 2007b:42) mandates workplaces with more than 10 employees to elect health and safety representatives to represent workers on issues related to their health and wellbeing (Republic of Namibia 2007b:43). In addition, the employer must establish a health and safety committee, at the request of a health and safety representative, in any workplace with more than 100 employees to monitor the application of health and safety regulations and rules in the workplace and to advise the employer on any matter concerning health and safety in the workplace (Republic of Namibia 2007b:50).

2.10.2.3 Regulations related to the health and safety of employees at work (Reg. No 156 of 1997)

Currently, there is no health and safety Act in Namibia that addresses all occupation health and safety-related issues in various workplaces. However, regulations relating to the Health and Safety of Employees at Work No 156 of 1997 under the Labour Act, (Labour Act No 6 of 1992), govern the status of OHS in the country as it makes provisions for the responsibilities and duties of employers in the provision of OHS in order to maintain the health and safety of employees at work (Republic of Namibia 1997:18).

The Regulations relating to health and safety of employees at work came into force under the Labour Act, Act No 6 of 1992 as amended by the Labour Act No 11 of 2007 and serves as a legislative framework that enforces, monitor and control work activities in Namibia. The Act serves to promote high standards of health and safety for the employees, through awareness creation by instilling safety culture among the workforces (Republic of Namibia 1997:16). Regulations related to the OHS of employees at work (No 156 of 1997) in Namibia, indeed require employers to ensure the health and safety of workers at workplaces (Republic of Namibia 1997:17).

Furthermore, the regulations require that all employers assess risks and hazards and put up control measures to prevent occupational injuries, accidents and fatalities (Republic of Namibia 1997:18). Any identified hazards should be communicated to workers, while workers should be educated on how to control and eliminate the hazards (Republic of Namibia 1997:17). However, as reported in the Ministry of Labour and Social Welfare 2012/2013 annual report (Ministry of Labour and Social Welfare of Namibia 2013:4), risk assessment is not being conducted in some sectors of Namibia as some companies are not developing safety policies, nominating safety committees or representatives to assist in the establishment and implementation of OHS.

The regulations (Regulations No 156 of 1997) also make provisions for the appointment of approved inspection authorities to inspect workplaces and in that way ensure compliance with OHS (Republic of Namibia 1997:20). The Act calls for the appointment of supervisors, OHS officers, OHS committees and OHS representatives to ensure that OHS is maintained at work places (Republic of Namibia 1997:27). The employers are also required to provide welfare facilities such as toilet facilities, resting rooms, and safe drinking water that are separate from the toilet (Republic of Namibia 1997:53).

In case of fatalities at work, section 22 of the regulations regarding the occupational health and safety of employees at work (Regulations No 156 of 1997) requires that, the chief inspector in the Ministry of Labour and Social Welfare be informed as soon as possible so that an investigation can be conducted by a labour inspector (Republic of Namibia 1997:46). In addition, the claims of a death benefit should be submitted to the social security commission for an effective benefit payment according to the Social Security Act (Act 34 of 1994). (Republic of Namibia 1994:3). The regulations focusing on the health and safety of employees at work (Regulations No 156 of 1997) state further that it is required of the employer to provide employees with Personal Protective Equipment (PPE) such as face masks, head protection, foot wear, safety belts and fall arresting devices, free of charge. These PPE should be maintained in proper working order and be replaced when defective (Republic of Namibia 1997:388). The workplaces are also required to have OHS policies which detail the arrangement of OHS for accident preventions. The policy should be signed by senior persons in the organisation and must be reviewed when necessary (Republic of Namibia 1997:388).

The regulations (Regulations No 156 of 1997) require employers to conduct medical surveillance such as pre-placement examination, periodic medical examination and exit occupational medical examinations to assess the workers' fitness for employment (Republic of Namibia 1997:421). Each workplace must also have a first aid station and certified first aiders who will assist when first aid is needed at work (Republic of Namibia 1997:469). Furthermore, every construction site is required to have an emergency plan in place, appoint an emergency coordinator known by all workers on site, and the list of emergency numbers to be called in case of an emergency was stated in the regulations (Republic of Namibia 1997:467). Therefore, it is a legal requirement to have a qualified, certified first aider available on site at all time and a first aid kit with the necessary supplies located a place known by all workers (Republic of Namibia 1997:467).

Regulations 243 to 257 relating to the health and safety of employees at work (Republic of Namibia 1997) focuses on the construction of safety through the stated safety and supervision of construction work regulatory requirements are stated (Republic of Namibia 1997:504). This chapter mentions further the requirements for the safety of buildings and demolition work, and equipment used during construction such as ladders and scaffoldings (Republic of Namibia 1997:491). Finally, the Act states that if the employer fails to follow the regulations, the punishment is N$ 2000. 00 or imprisonment for a term not exceeding six months or to fine and imprisonment (Republic of Namibia 1997:504). However, the regulations do not mention occupational health components but it only deals with safety.

2.10.2.4 Employees compensation Act, 1941 (Act No 30 of 1941) as amended under the Employees Compensation Amendment Act, 1995 (Act No 5 of 1995)

The Employees compensation Act (Employee compensation Act No 30 of 1941) provides for the compensation of workers and payment of medical expenses incurred by employees in cases of occupational injuries, diseases and death related to a worker's employment (Republic of Namibia 1995:1). The provision is made for all employers who employ one or more employees to register with the Social Security Commission and pay an annual fee for each employee (Republic of Namibia 1995:15) to meet criteria to claim from employee compensation fund when workers sustained workplaces injuries or fatalities.

The Act also indicates that all injuries at worksites should be reported as soon as possible to the Social Security Commission as stipulated by the Social Security Act No 34 of 1994 (Republic of Namibia 1995:3).

2.10.2.5 National Occupational Health policy

The National Occupational Health policy, developed under the custodianship of the Ministry of Health and Social Services, seeks to promote health and safety at work by preventing injuries, diseases and fatality that may arise due to the work-related activities (Ministry of Health and Social Services of Namibia 2006:9). In that regard, the National occupational health policy describes the responsibilities of the employers bend on ensuring the health of employees and these include: the provision of free occupational health services in all employment sectors; conducting risk assessment to identify, control and assess the availability of occupational disease and injuries and provide compensation; and the provision of health and safety training and education to the employees (Ministry of Health and Social Services of Namibia 2006:9).

Based on this policy the statutory duties of employer are defined as:

- The employer is responsible and accountable for carrying out risk assessment in the work places to identify hazards and risk and put up preventive measures to protect workers against hazards and risks.
- The hazard control measures should entail engineering control, administrative measures and personal protective equipment (PPE).
- The employer should ensure that PPE be provided to employees based on the identified hazards and workers should be trained on PPE usage.
- OHS policy should be developed at each workplace.
- Medical surveillance, first aid training and emergency arrangements should be provided at all workplaces (Ministry of Health and Social Services of Namibia 2006:12).

This policy is therefore regarded as a framework for planning, organisation, implementation and the monitoring and evaluation of occupational health services in Namibia (Ministry of Health and Social Services of Namibia 2006:2).

2.10.2.6 Environmental Management Act (Act No 7 of 2007)

The Environmental Management Act No 7 of 2007 was promulgated to prevent environmental pollution and poor waste management from construction sites, prevent environment degradation, conserve the environment and protect natural resources (Republic of Namibia 2007a:2).

The Environmental Management Act is in line with the International Standard for environmental management (ISO 14001) which advocates for environmental management to prevent the degradation of the environment arising from daily industrial activities such as construction (International Organization for Standardization 2015:1). Similarly, the report of the United Nations climate change conference held in 2009 highlight the need for pollution reduction for sustainable development (Zutshi & Creed

2015:92). Therefore, the Act advocates for compliance at the worksites in order to safeguard the safety of the communities (Republic of Namibia 2007a:14).

2.10.3 Compliance with occupational health and safety legislations in the construction industry

Compliance is the process of observing requirements set by the employers and workers to prevent occupational accidents, injuries, diseases and fatalities (Zin & Ismail 2012:743). Compliance assists in the establishment of efficient, effective and safety during work performances (Zin & Ismail 2012:744). Globally, the construction industry is rated as the worst performer among other industries, in as far as occupational health and safety is concerned, because of its proneness to high injuries and fatal accidents with the construction fatalities in the UK being five times high than other industries (Health and Safety Executive 2014:7). Hence, the nature of construction work is such that employees are at risk to occupational diseases, accidents, injuries and fatalities (Smallwood & Ajayi 2009:23; Yoon et al 2013:202).

For instance, India's construction sector is largely characterised by an unorganised workforce and hardly follows standard regulations laid down by the government agencies (Beriha et al 2012:182). However, the Southern African Development Community (SADC) and particularly South Africa have extensive measures in place for the provision of OHS. The measures include the demand for the employers to report baseline risk assessments and OHS plans based on risk assessments related to the intended construction work to ensure that precautions are in place, and the registration of all subcontractors for compensation according to the Compensation for Occupational Injuries and Diseases Act Act No 130, 1993, as amended (Republic of South Africa 1993a:1).

The results from the literatures indicate that the employers' ignorance of the ILO's legal guidelines on occupational health and safety at workplaces exposes workers to the risk of occupational injuries (Gürcanli and Müngen 2013:593). In addition, the employers' negative attitudes and ignorance toward occupational health and safety practices also contributes to high rates of injuries in the construction industries (Jamal & Khan 2006:2; Zen & Ismail 2011:3). This view is supported by the findings from the study by Ale, Baksteen, Bellamy, Bloemhot, Goossens, Hale, Mud, Papazoglou, Post and Whiston (2008:176) on construction workers in the Netherland, which indicate that many occupational injuries and fatalities are the results of either the failure of the management to put safety measures in place or poor worker attention to safety measures during construction work.

Meanwhile, the proponents of OHS advocate for occupational research and the appointment of specialist at work places to identify the factors that compromise the safety and health of the employees (Aneziris et al 2013:382). It is also proposed that necessary legal frameworks for operationalisation of OHS be established globally. The frameworks such as the Health and Safety Executive in the UK, Japan Industrial Safety and Health Association (JISHA) and the USA’s Occupational Safety and Health Administration (OSHA) in US, reinforce compliance with the health and safety legislations at the work places and Occupational Health Acts in several developed countries (Zeng et al 2008:618; Russ 2010:11; Zhou et al 2012:103).

South Africa’s Health and Safety Act, No 85 of 1993 (Republic of South Africa 1993 b) and the Construction Regulations, No 84 of 2014 (Republic of South Africa 2014) govern the country’s construction activities in order to eliminate the potential hazards during the design and construction phases and thus reduce the negative consequences such as occupational injuries and fatalities (Republic of South Africa 1993b:1). However, at times the construction industry employers and workers do not adhere to the stipulated requirements (Zin & Ismail 2012:748) and as a result, the number of accidents and fatalities in the construction industry has been increasing (Geminiani & Smallwood 2008:5).

According to Village and Osty (2010:771), it is the responsibility of management to organise and control OHS activities in order to comply with the legal requirements of the country. This could be done by delegating health and safety responsibilities to individuals who would be able to identify shortcomings and rectify them within reasonable time such as three days as stipulated by the law (Zin & Ismail 2012:743). Furthermore, the availability of safety representatives, health and safety officers and that of health and safety committees, is of significant values to reporting and rectifying health and safety issues on the construction sites (Törner & Pousette 2009:402). Therefore, developed countries, as in the case of Japan, have a high compliance with OHS legislation with their health and safety committees and representatives nominated to ensure safety onsite and to represent workers in trade unions (Lam 2001:16).

It has been noted that lack of commitment within management, poor supervision and an absence or inadequate training leads to poor OHS management and non-compliance in the construction industries (Cassiem 2009:1). A study by Zhu, Fan, Fu and Clissold (2010:44) on the safety climate in China emphasises that management commitments to safety and safety training have a positive influence on safety behaviour and safety involvement. However, Smallwood and Ajayi (2009:21) argue that workers tend to compromise OHS due to work pace or work overload which may affect their behaviour towards OHS and lead to higher accidents at work. OHS should be discussed and implemented by both management and workers for the good maintenance of a health and safety culture in the organisation (Törner & Pousette 2009:402). Smallwood and Ajayi (2009:21) conducted cross sectional self-administered questionnaires in their study on 339 South African construction workers, which found out that top management support of OHS is important for the allocation of resources towards OHS implementation, but supervisors at operational level should ensure OHS procedures, policies and practices are adhered to (Smallwood & Ajayi 2009:25).

Thailand strengthens its country's OHS compliance in construction companies through the requirement that companies must submit, during tendering processes, their safety management programmes in construction stating how accidents and injuries would be prevented during construction work and indicating how compliant they would be to OHS (Ngamthampunpol 2008:22). Similarly, construction companies in Japan with poor safety records are penalised and prohibited to tender (Lam 2001:16).

However, Namibia does not have provisions for a legal framework that requires the submission of a health and safety plan during tender application. This is cause for concern as there would be no indication that the construction companies will comply with occupational health and safety after the awarding of tenders. Nonetheless, the enforcement of occupational health and safety practice in Namibia is conducted by the occupational health and safety inspectors from the Ministry of Labour and Social Welfare, through their regular inspections of construction sites and communication with the workers and employers on the OHS requirements. This is in line with Convention 81 which gives guidelines that labour inspectors have to provide advice on occupational health and safety and to enforce legislation (ILO 1947:1). These labour inspectors should follow the national legislation which states that a site should close down should there be a situation that requires the closing down of a construction site after it has been deemed likely to cause accidents or work-related diseases, implying serious damage to the worker's health and wellbeing (Saurin 2016:241). Therefore, Links and Haimbodi (2011:2) argue that it is crucial for labour inspectors to take regular inspections on construction sites to ensure compliance with the labour legislation, such as the implementation of occupational health and safety management strategies, which governs the construction sector.

However, the labour inspectors reported that most industries in Namibia, including the construction sector, are noncompliant to OHS legislations (Ministry of Labour, Industrial Relations and Employment creation of Namibia 2016:1). Only 10% of the workplaces inspected during the 2015/2016 financial year were found to be in good compliance with OHS legislations (Ministry of Labour, Industrial relations and Employment creation of Namibia 2016:1).

2.10.3.1 Occupational Health and Safety Management System (OHSMS)

An Occupational Health and Safety Management system is a model developed by the ILO in 2001 for employers to have a framework for a continuous systematic management and improvement of OHS policies, plans, programmes and projects (Taderera 2012:116). The steps for the OHSMs are policy, organising, planning and implementation, evaluation and action for improvement (ILO-OSH 2001:7). According to (Alli 2008:65) the process of OHSMS workplace inspections should include the assessment of the environmental factors that may affect workers' health such as the provision of hygiene or welfare and sanitation facilities, PPE provision and availability of hazards in the working environment.

Yoon et al (2013:202) conducted a study to assess the effect of OHSMS on the work-related accident rates in South Korea's construction industry. The findings show that the accident rates decreased by 67% and fatality accident rates decreased by 10.5% in construction companies which implemented OHSMS. However, the study also found out that OHSMS were not implemented in the majority of construction companies. Therefore, the implementation of an effective occupational health and safety services would result in a decrease of occupational diseases and injury and reduction of the costs associated with workplace accidents (Beriha et al 2012:181). Medical surveillance should also be conducted free of charge in consultation with workers but should not result in loss of income (Alli 2008:75).

2.10.3.2 Welfare facilities provision in the construction industry

According to the HSE (2010:1) the employer is required to provide adequate toilet and washing facilities, resting rooms and a clothes storing area in order to benefit the OHS of workers. Furthermore, clean drinking water should be provided. However, a study conducted in India to investigate the constraints and opportunities faced by women in the construction industry reveals that 55% of the participants stated that basic facilities such as toilet and drinking water were not provided in 64% of the construction sites (Baruah 2010:208). In contrast, the results from a study by Irumba (2014:118) reveal that 90% of the inspected construction sites were found to be providing drinking water.

2.10.3.3 Provision of Personal Protective Equipment (PPE) by employer and usage by employees

PPE are important in ensuring OHS at workplaces, especially, when properly selected and used by workers, as they provide protection against risks (Muema et al 2015:75). The proponents of OHS advocate for the use of protective equipment by workers, including the use of face masks to protect against dust inhalation (Salminen 2015:727). PPE should be used as a control measure but not to eliminate the hazard during construction work (Zhao et al 2015:143). However, the proper usage of PPE depends on the training of construction workers, the availability of the correct equipment for the job at all times, and good supervision and enforcement (Othman 2009:49). Lack and inappropriate use of PPE due to unavailability or ignorance also contributes to the increase in occupational, diseases, injuries and fatalities in the construction industry (Cheng et al 2012:221). In addition, it was revealed by the study conducted in Taiwan, that 38% of workers in the construction industry do not use PPE correctly (Cheng et al 2012:216) which is a sign of ignorance or unsafe acts or lack of knowledge. Lack of PPE use was also reported as contributing to accidents in the construction industry in the USA according to the OSHA accident reports (Chi & Han 2013:1031) as some employers do not provide PPE to their workers, while some workers prefer not to use them even if they have been supplied by their employers (Arquillos et al 2012:384).

Therefore, it is the employer’s responsibilities to ensure that workers are supervised on wearing safety tools when performing jobs at construction sites, even though workers should be informed to take responsibility for their own health and safety especially by imposing punishment if they are not adhering to safety rules (Zin & Ismail 2012:743).

2.10.3.4 Literature findings on electric safety in the construction industry

A majority of construction sites use electricity although is known to be hazardous (Phoya 2012:33). Most electric injuries and fatalities are due to use of poorly maintained electrical equipment, working near overhead high tension electric lines, contact with underground electric cables during excavation work and working without appropriate personal protective equipment (Phoya 2012:33). Electrical injuries could be electric shock, electrocution, and electric burn and falls after contact with electric energy (Rahmani et al 2013:160). Furthermore, negligence or ignorance is most cause of fatalities due to electricity shock. Therefore, poor safety compliance by the construction sites management is the main cause of electric injuries as many workers would have not attended safety training and only practice safety through experience. It is, therefore, suggested that construction managers should strictly stick to a hierarchy of control rules by giving priority to higher level of controls that prevent electric injuries (Zhao et al 2015:143).

The USA reported 49% of fatalities from 2003 to 2006 which were caused by electric hazards and these were three times higher in the construction industries than in other industries (Hallowell 2008:1). Moreover, electrical hazards, such as electrocution, were one of the top hazards reported in the US in 2014 as 51.1% electrical fatalities occurred in the construction industry (Zhao et al 2015:143). In addition, a study examining Iran's electricity distribution company with regard to the causes of occupational accidents indicates that 75% of the fatalities were due to electric injuries caused by worker's negligence (Rahmani et al 2013:162). According to Salehi, Fatemi, Asadi, Shoar, Der Ghazarian and Samimi (2014:303), 52% of the electrical injuries suffered by Iranian construction workers were due to contact with overhead power.

It is imperative for the government sectors of different countries and the construction companies to implement many strategies, such as the use of rubber insulating equipment and locking devices to prevent these injuries, if they are to reduce the disproportionate electricity-related injury rate (Albert & Hallowell 2013:121). Unfortunately, these strategies are often not cost effective in some construction and maintenance scenarios. Therefore, construction companies are faced with complex decisions that involve comparing the cost of injury prevention with the expected safety benefit (Albert & Hallowell 2013:118)

2.10.3.5 Literature findings on work equipment safety in the construction industry

Work equipment, such as ladders and cranes, is commonly used on the construction sites for different activities that include lifting and the handling of material (Sertyesilisiki, Tunstall & McLouglin 2010:72). However, the improper use of work equipment can result in injuries, accidents, fatalities or permanent disabilities (Jocelyn et al 2016:64). Sertyesilisiki et al (2010:76) argue that equipment selection based on environment and access point is of utmost importance. Furthermore, work equipment should be maintained (Aneziris, Topali & Papazoglou 2012:45). It is also important that risk assessment be conducted before using equipment to prevent accidents and injuries (Aneziris et al 2013:394).

2.10.3.6 Literature findings on emergency preparedness in the construction industry

Emergency refers to the sudden events which cause or would cause property damage, casualties or environmental damage that leads to a significant social impact or security risk (Chen, Xie & Wu 2012:403). According to the Occupational Safety and Health Administration (OSHA) (2004:50) in the USA, an emergency response plan should be available at workplaces. The plan should be developed before construction work commences and could be adjusted after the work has started. This plan should include the following:

- Hazard identification and assessment: this includes hazard identification consultation and the provision of material safety data sheet. It also spells out the way workers should be informed about on emergencies such as using air horns for evacuation procedure.
- Emergency resources: these include the emergency number to call the response team so that it reaches the site on time, first aid kit availability, fire extinguishers, and the availability of ambulance or medical staff on site.

- Communication systems: these include the system to communicate emergency such as telephone numbers for emergency response team, the police, ambulance, and fire department. A backup system such, as a cell phone, should be available in case of a telephone cut off.
- Plan administration: people responsible for the emergency plan should be aware of their roles and review the plan when necessary.
- Emergency response procedures: the person in charge should know what is expected, especially in assessing the situation, being calm, eliminating further loses and ensuring that emergency services are informed and guided for easy access (Azadeh-Fard, Schuh, Rashedi & Camelio 2015:161).
- Emergency communication of the procedure: the procedure should be reviewed with workers, contractors and OHS committees and be reviewed when need arises.
- Debriefing and post-traumatic stress procedure: this includes the provision of professional help, such as counselling, to workers. Debriefing should be conducted to all workers.

2.10.3.7 Literature findings on first aid provision in the construction industry

The Convention concerning safety and health in construction (ILO 1988) states that it is the responsibility of the employer to ensure the provision of first aid services on the construction sites at all time. This service should include the provision of first aid kit and qualified first aiders ready to render the services when first aid is required. However, the injured workers should be taken for medical attention if the injury sustained is beyond first aid management. Irumba (2014:118) argues that first aid provision reduces the damaging effects that could result from accidents. In addition, Irumba's (2014:112) study on Kampala construction sites that evaluated whether good OHS practice existed, found out that 87% of the construction sites were provided with first aid facilities.

2.10.3.8 Literature findings on fire prevention and safety measure provision

Fire is a potential hazard on a construction site and is mostly caused by building material waste, poor storage of highly flammable materials and gases, smoking in non-smoking designated area, poor maintenance of welding materials or machineries, coming in contact with buried gas or electric lines and accumulation of rubbish against electrical equipment which leads to overheating (Zhu et al 2010:31; Perlman et al 2014:24).

Irumba (2014:112) conducted a study in Uganda which reveals that a majority of fire injuries were from gas burns and fire caused by hot objects but during that study only 20% of the construction sites were found to be providing fire prevention services.

The UK's Construction Health and Safety and Welfare Regulations (No 3004 of 1992) recommend that construction site managers play a significant role in preventing injuries arising from fire, ensuring that there is an emergency route in case of fire, the provision of fire extinguish equipment and in training workers on how to use the anti-fire and fire-fighting equipment (Health and Safety Executive 2014:3). It is also required of a construction site to apply for a fire certificate before commencement with construction work.

2.10.3.9 Literature findings on enterprise community involvement

Enterprise community involvement refers to the exertion of a construction company's social corporate responsibility by providing voluntary initiatives to meet environmental and social needs (ILO 2015:30). It is a legal requirement for the construction companies to contribute to the well-being of workers, workers' families and the communities where construction activities are taking place (Jiang & Wong 2016:850). However, the construction industry generates large amounts of raw materials and waste which may cause the deterioration of the environment (Ossa, Garcia & Botero 2016:379; Wahi, Joseph, Tawie & Ikau 2016:277), environmental pollution and carbon dioxide emission (Ajayi et al 2015:101; Zeng et al 2008:1157). Furthermore, Udawatta, Zuo, Chiveralls and Zillante (2015:73) conducted a study on construction activities with the objective of improving waste management in Australia's construction projects and found out that, training and education on waste management, regulations and legislations enforcement, and attitude changes on waste minimisation were highlighted by a majority of participants as significant towards curbing environmental pollution. Therefore, the use of recycled construction and demolition waste aggregates is commended (Ossa et al 2016:379).

2.10.3.10 Literature findings on the availability of personal health resources documents in the construction industry

Workers should have the general responsibility for their own health and safety and for those who may be affected by their action (Alli 2008:48). Furthermore, workers have the right to refuse unsafe work without being discriminated. However, the health and safety and OHS responsibility should be stated in the job description (WorkSafe Bc 2013:5).

2.10.3.11 Literature findings on availability of documents regarding hazard identification and control documents in the construction industry

The construction site should keep accident registers and injury on duty reporting forms on site which are used to report accidents to the regulatory authority. Furthermore, employers should ensure that inspections are conducted at the construction sites to identify hazards by means of using a checklist and procedures for after-inspection action should be stated (WorkSafe Bc 2013:9).

2.10.3.12 Literature findings on documents related to occupational health and safety induction and training in the construction industry

The literatures outline the importance of the OHS induction of new construction workers, and the content of the induction modules and procedures to be used in order to prevent accidents (Zhao, Zhao, Davidson & Zue 2012:284; Geminiani 2008:205). Phoya (2012:31) notes that OHS training is required on recruitment, induction or upon being exposed to new risks, change in responsibility, new equipment or too young or disabled worker, as the latter categories are prone to injuries. Furthermore, it is imperative that the inducted or trained construction workers should sign a register to prove that training and induction has been conducted (WorkSafe Bc 2013:16).

The safety training should be conducted on regular basis to make the workers aware of the risks at workplaces and how their behaviours may affect these risks (Chi & Han 2013:1027). In this regard, safety training and communication, such as tool box talk, raises hazard awareness, develops knowledge and skills, and reinforces workplaces safety practices (Olson et al 2016:130). Bahn and Barratt-Pugh (2012:337) outline the duty of a supervisor in ensuring that the orientation of new staff members is conducted with emphasis on health and safety awareness during work. Finally, the induction should include the following topics: introduction to the job site, OHS rules and regulations, hazard information, PPE requirements, fire protection, emergency preparedness, first aid, injuries reporting, permit requirements and disciplinary procedures (Ngamthampunpol 2008:39).

2.10.3.13 Literature findings on documents regarding psychosocial work environment in the construction industry

The Discrimination (Employment and Occupation) Convention 1958 (No 111 of 1958) states that, the ratified member states should declare a national equality policy to eliminate discrimination at workplaces. The convention states further that workers should be free from harassment based on race, colour, religion, political affiliation or social background (ILO 1958:article 1). In addition, a study by McDonald, Chen and Cherry (2009:53) among construction workers in Colorado shows that a significant but few construction workers suffered from mental problems, which reveals that construction workers are less likely to develop mental problem compared to workers from other industrial categories where by 30% of other worker's categories reported to suffer from mental problem.

The industry must also be fair to those infected with HIV. There are over 70% of workers who are living with HIV provision of treatment, thus calling for preventive measures and the protection of the rights of people living with HIV/AIDS from discrimination and stigma (Alli 2008:91). In addition, the ILO code of practice of 2001 states that the member states should develop a workplace HIV/AIDS policy in collaboration with workers, employers and government.

2.11 CONCLUSION

This chapter described occupational health and safety situation in the Namibian context and the associated regulatory frameworks. It also discussed the OHS situation in the construction industries globally and considered issues such as occupational accidents, injuries, diseases and fatalities. Lastly, the awareness of construction workers on OHS and the compliance in the construction industry was explained.

The following chapter discusses the theoretical framework applied in this study.

CHAPTER 3

THEORETICAL FRAMEWORK OF THE RESEARCH

3.1 INTRODUCTION

This chapter discusses the theoretical framework drawing on the World Health Organization (WHO) healthy workplace model which informs this study. The chapter outlines the components of the WHO healthy workplace model and explains the model's application to the current study. Furthermore, the steps for continuous improvement process to sustain the healthy workplaces and co-principles for the success of the healthy workplaces initiative is described in this chapter.

3.2 THE WORLD HEALTH ORGANIZATION HEALTHY WORKPLACE MODEL

The WHO healthy workplace model was developed for use in the WHO member states' workplaces in order to maintain global worker health and safety. The development of the WHO healthy workplace model aimed at protecting and promoting the health, safety and well-being of workers through an on-going improvement process that seeks to sustain the healthy workplace programme (Burton 2010:4).

In 1995 the WHO approved a Global strategy on occupational health for all (WHO 2010:6), which requires all member states to adhere to the promotion of health and safety at work. The World Health Assembly also endorsed the Global Plan of Action (GPA) on Workers Health in May 2007 in order for its member states to put up strategies that promote workers' occupational health and safety and to develop a global framework on healthy workplaces that would guide employers and workers for the period 2008-2017 (Burton 2010:13). The member states proposed to develop a healthy workplace model for the benefit of workers' mental, physical and social health as well as the benefit of the organisations with regard to increasing productivity (Burton 2010:7). The proposed model was developed in a way that allowed for a continuous evaluation and improvement of various workplaces by member states (Burton 2010:89).

Consequently, the WHO healthy workplaces model was developed as a paradigm shift from the occupational health labour approach to the public health approach, which covers the occupational health and safety of worker's families and communities and considers all determinants of health (Harrison & Dawson 2016:145). In fact, the WHO healthy workplaces model is a combination of a health protection and health promotion initiative for all workers' categories, such as the self-employed, permanent, casual and temporarily recruited workers (Burton 2010:16). This model requires all stakeholders, such as employers and workers to promote health and prevent occupational accidents, injuries, diseases and fatalities at work (WHO 2010:15).

The WHO healthy workplace model was adopted for the current study as it addresses a number of worker health and safety aspects at workplaces. The WHO healthy workplace model acknowledges that a working environment can have a detrimental effect on workers (WHO 2010:6). It notes further that workers' needs should be addressed to attain complete occupational health and safety of the workers' physical, psychosocial and psychological needs (Burton 2010:15). As a result, an application of the WHO healthy workplace model can promote the health and safety of workers and prevent occupational accidents, injuries and diseases (Bollo 2011:95).

3.2.1 Justification for using the World Health Organization healthy workplace model

This researcher chose the WHO healthy workplace model for this study in order to use it as a framework to address the current health and safety status of the construction industries in Namibia and develop the practical guidelines for the promotion of OHS in the construction industry. In addition, the WHO healthy workplace model is comprehensive in addressing the workers' physical and psychological wellbeing (Burton 2010:83). Furthermore, the model was applied to address community involvement and advocate for the organisations' corporal and social responsibilities (WHO 2010:18) by adhering to the regulatory framework and preventing environmental pollution and degradation arising from the construction activities. In fact, the model is relevant for the current study as it focuses on maintaining health and safety in the construction industry, for as Burton (2010:25) states, the community or the environment can affect the workers' performance.

The WHO healthy workplace model is also ideal for this study because it addresses the importance of workers' involvement in decision-making, which ensures the success of a programme. In fact, workers and their representative should give their opinions and their ideas should be implemented and respected (Burton 2010:62). This applies to the focus of this study because the practical guidelines developed are based on the participant's views and the study results on the construction industry's OHS improvement.

The model highlights the need for a continuous evaluation of the occupational health and safety strategies in order to check for any improvements or when necessary to change to other strategies which promote workers' health and safety at work (WHO 2010:20). It is envisaged that the use of the WHO healthy workplace model will provide employers and construction workers the guidance on how to comply with the model because of its comprehensiveness, which will also lead to proper management of workplaces in accordance with the terms of OHS promotion (Gϋrcanlı, Bardan & Uzun 2015:60). As a result, this will promote occupational health and safety in Windhoek's construction industry. The benefit of the WHO healthy workplace model is that it can be applied in any workplaces with positive results (Burton 2010:11). Furthermore, it is envisaged that the chosen model will assist the construction workers, irrespective of age, gender, educational status or ethnic background, in the prevention of occupational health and safety-related challenges (WHO 2010:11).

An application of the aspects of the WHO healthy workplace model organization should comply with the laws and legislations applicable in Namibia in order to maintain the workers' health and safety and prevent legal action by the regulative body of the countries (Burton 2010:6). In fact, the WHO healthy workplace model calls for collaboration between the employers and workers (WHO 2010:12). Workers should be included in the decision making processes pertaining to OHS (Burton 2010:47). Furthermore, organisations can be successful in achieving their OHS goals by setting up healthy workplaces programmes that are relevant to the needs of the workers and ensure that workers are psychologically and physically healthy (Burton 2010:6).

Therefore, this model was chosen with the objective of achieving an effective outcome towards the promotion of occupational health and safety in the construction industry in Windhoek, Namibia. The model is used, with an awareness that the negative impact caused by occupational accidents, injuries and diseases may affect the workers physically and emotionally (Muiruri & Mulinge 2014:1). Occupational health and safety challenges demotivate construction workers as they fear for their quality of life (Kielblock 2012:21). Therefore, it is envisaged that construction workers will be motivated and feel supported by the management through an implementation of the developed practical guidelines based on the study outcome and WHO healthy workplace model. In addition, the motivation of workers leads to an increase in productivity, less OHS challenges and low staff turnover (WHO 2010:9).

3.2.2 Components of the WHO healthy workplace model

The WHO healthy workplace model is made up of four components seeking to promote OHS at workplaces globally by emphasising the need for employers and workers to integrate for the improvement of the occupational health and safety in the organisation, and thereby improve productivity, efficiency and competitiveness (see figure 3.1) (WHO 2010:12). The components are, physical work environment, psychosocial work environment, personal health resources and enterprise community involvement (WHO 2010:12).

Figure 3.1 illustrates the components of the WHO healthy workplace model. The components are overlapping and as all components should be integrated in order to achieve a safe working environment. Furthermore, any defect of each component will cause an OHS challenge in the organization (WHO 2010:14).

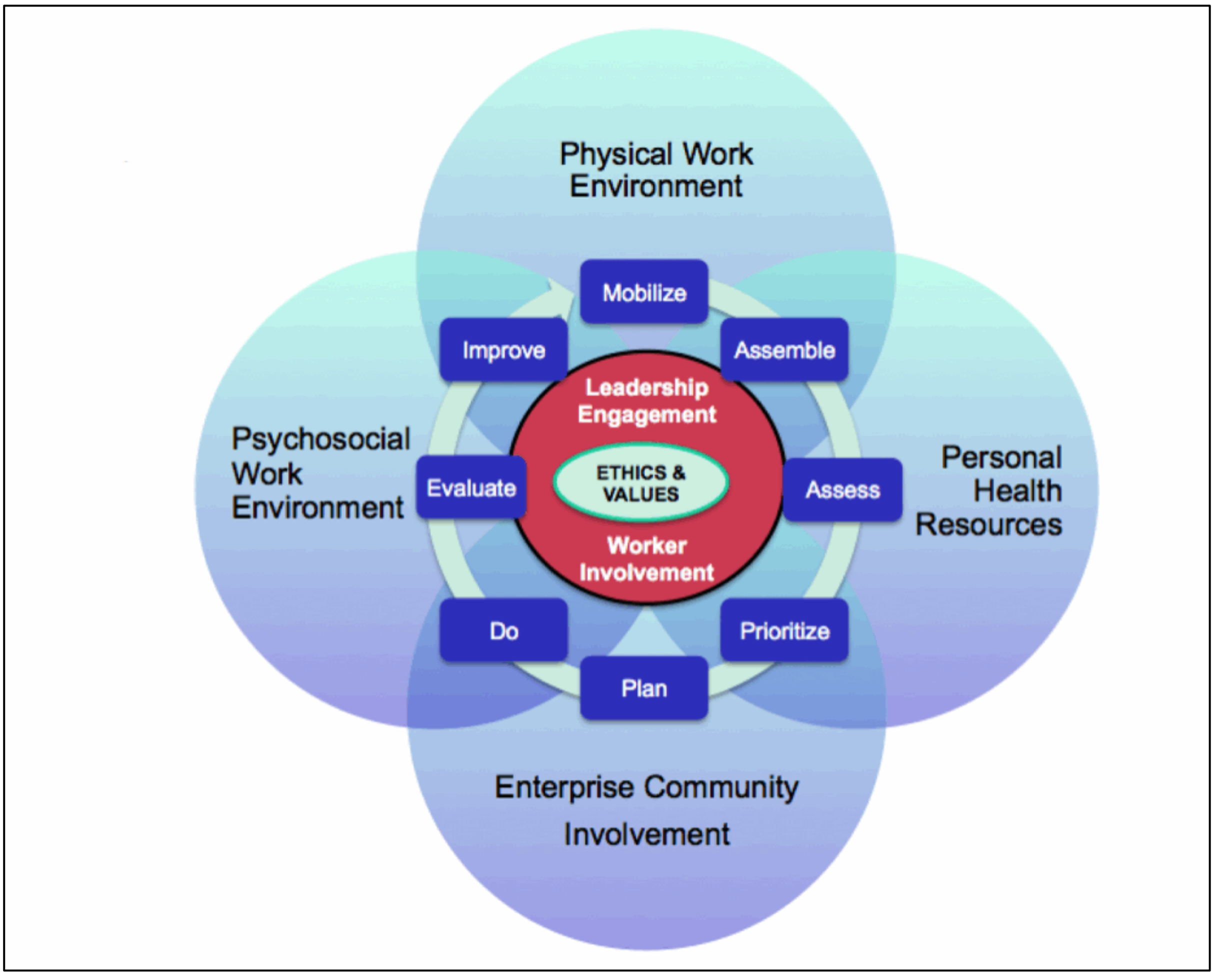


Figure 3.1 Diagram of the WHO healthy workplace model

(Burton 2010:3; WHO 2010:13)

3.2.2.1 Physical work environment

"Physical work environment 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" (Burton 2010:84). The WHO healthy workplace model acknowledges that there are different hazards in the physical work environment which may affect the physical or mental health and safety of the workers (Burton 2010:28). The different hazards may be physical, chemical, biological, ergonomic, mechanical or mobile (WHO 2010:14). The physical work environment in the construction industry context such as heat stress is known to affect productivity, increase occupational injuries and result in fatalities as a result of heat illness (Yi & Chan 2013:104). Furthermore, a nonconductive physical working environment negatively affects the motivation, satisfaction, health and performance of workers (Badayai 2012:486).

The physical health environment component explains the organization of the work environment in relation to OHS issues, such as the availability of the OHS programme at the construction sites, which enable the implementation of an OHS programme that prevents occupational accidents, diseases, injuries and fatalities (Burton 2010:84). The model advocates for the identification of hazards at workplaces and taking action to eliminate or mitigate hazards, which ultimately prevents hazard exposures (WHO 2010:15). Furthermore, the model underlines hazard recognition, hazard control through a hierarchy of controls that includes elimination or substitution, engineering controls, administrative controls and the use of Personal Protective Equipment (PPE) (WHO 2010:15).

Literatures note that the health status and ill-health of workers is determined by the work environment (Bambra, Gibson, Sowden, Wright, Whitehead & Petticrew; Petticrew 2009:453). By implication, a healthy physical workplace environment leads to good job performance because workers will feel motivated (Burton 2010:35). On the contrary, an unsuitable workplace environment causes low productivity and less job satisfaction (Badayai 2012:486).

The physical work environment aspect links well with this study as it is known that construction workers are exposed to physical hazards which may affect their health, concentration and attention negatively and result in occupational accidents and diseases (Badayai 2012:488). Furthermore, the physical work environment for construction workers is crucial as the construction industry workers are mostly exposed to extreme weather conditions, such as the heat or cold temperatures, as its activities are conducted outdoor (Alshebani & Wedawatta 2014:634).

This study’s data regarding the physical working environment was gathered through questionnaires and a site inspection checklist. The gathered data focused on the availability and implementation of OHS programmes on construction sites, availability of the OHS programme, risk assessment and hazard identification, work equipment safety, electrical safety and emergency preparedness. The implementation of an OHS programme is necessary for the promotion of OHS in the construction working environment as it compels the employers in particular and workers to identify, control or eliminate hazards. Furthermore, workers should also be trained on OHS to create an awareness of the occupational health and safety challenges, and the need for prevention and the maintenance of OHS at workplaces (Mahmoudi et al 2014:128). Finally, OHS officers, OHS committee and OHS representatives should also be nominated to enforce OHS programmes at workplaces (Badayai 2012:486).

3.2.2.2 Psychosocial work environment

This component emphasises the importance of the organisational culture, values, attitudes and work practices that affect the mental and physical well-being of workers (WHO 2010:15). It was observed that worker exposure to psychosocial hazards such as harassment, discrimination, long working hours, stress and poor communication with employers affects the health status of the workers in severely negative way (Burton 2010:86). The WHO healthy workplace model calls for a psychosocial hazards identification by means of workplace surveys or interviews with workers (WHO 2010:16). Accordingly, the WHO healthy workplace model (WHO 2010:16) outlines how some of the hazards should be addressed as shown below:

- Reallocation of work to reduce workload in cases of long working hours or work overload.
- Establishment and implementation of workplace anti-harassment and anti-discrimination policy.
- Management support and proper communication between employers and workers.

In addition, the work environment should be assessed for psychosocial indicators such as common mental health disorders and stress in order to implement relevant strategies, which seek to address the psychosocial hazards (Boschmana et al 2013:749). A study by Bambra et al (2009:455) indicates the relationship between the psychosocial work environment, health status and work related stress, and argues that a person in a non-conducive working environment is at risk of developing healthy problems including work-related stress which may leads to depression. In addition, failure of the management to involve workers in decision making causes depression (Boschman et al 2013:748). Hence, the workers' psychosocial health should be respected because any psychosocial problems may cause physical problems or loss of concentration and predispose a person to occupational injuries/ accidents (Burton 2010:85).

Construction workers in Namibia are no exception to psychosocial hazards as they are also exposed to such hazards in their workplaces and this mostly attributed to their nomadic style of their work (Boschman et al 2013:752). The incidence of occupational mental health disorders in the Netherlands construction industry increased from 11.2% in 2007 to 16.1% in 2010 (Netherlands Centre for Occupational Diseases cited in Boschman et al 2013:749). Therefore, construction workers should be educated on how to prevent psychosocial problems such as stress (Bambra et al 2009:455).

3.2.2.3 Personal health resources

The WHO healthy workplace model defines personal health resources as “the health services, information, resources, opportunities, flexibility and otherwise supportive environment an enterprise provides to workers to support or motivate their efforts to improve or maintain healthy personal lifestyles, as well as to monitor and support their physical and mental health” (WHO 2010:16). The personal health resources aspects include the provision of information to workers on how to maintain healthy lifestyles, provision of flexible break time and that of medical services (WHO 2010:17).

Furthermore, the model (WHO 2012:18) states that in order for the employer to address the personal health resources at workplaces, they should ensure that the following measures are in place:

- Provision of medical services at work for early detection of diseases.
- Provision of information on health-related behaviours such as hygiene, exercise, rest, diet and sleep.
- Training of workers on disease prevention and occupational health and safety promotion.
- Provision of financial support for wellness activities e. G. gym fee.
- Development and implementation of policy supporting healthy lifestyles.
- Provision of subsidised healthy food choices in cafeterias and vending machines at workplaces.

- Development and enforcing no-smoking policies in the workplace.

Encouraging workers to engage in a healthy lifestyle increases their health awareness, prevents absenteeism and increases job productivity. Therefore, the provision of different services tailoring healthy workplaces helps workers to make informed choices about health promoting behaviours (WHO 2010:18).

3.2.2.4 Enterprise community involvement

The WHO (2010:18e) states that "enterprise community involvement refers to the activities that an enterprise might engage, or expertise and resources it might provide, to support the social and physical wellbeing of a community where it operates". The enterprise community involvement aspect explores the organisation's relationship with the community and how the organisations assist the families and community with corporal responsibilities. The World Health Organization (WHO 2010:19) identifies the examples of services that enterprises can provided as:

- Pollution emissions control.
- Initiating clean-up operations.
- Implementation of gender equality policies within the workplace to protect and support women.
- Establishment and implementation of anti-discrimination policies to protect vulnerable groups.
- Subsidiisng public transportation and bicycles or the provision of worker transport to and from work.

This aspect was applied to this study in the assessment of waste management training in order to prevent environmental damage as well as the provision of transport to and from work. Furthermore, the study findings guided the researcher in the development of the practical guidelines seeking to improve OHS in the construction industry.

3.2.3 Continual improvement process to promote healthy workplaces

The development of the WHO healthy workplaces model integrates the organisational process of "continual improvement" which ensures that a health, safety and well-being programme meets the needs of all concerned and is sustainable over time. The continual improvement process follows steps that lead to the development of a healthy workplaces' programme, the sustainability and effectiveness of healthy workplaces programmes (WHO 2010:20; Burton 2010:89).

An organisation's success is ensured by the implementation of a healthy workplace programme and that of a systematic process for continuous improvement. The eight steps for continual process include components/elements such as: Mobilise, Assemble, Assess, Prioritise, Plan, Do, Evaluate and Improve (WHO 2010:20). The elements described here were adapted in order to develop practical guidelines that aim to promote OHS on Namibian construction sites.

Step 1: Mobilise

The WHO healthy workplaces model acknowledges the collection of information about peoples' needs, values and priority in order to mobilise workers, stakeholders and employers to prepare for a change (WHO 2010:20). Furthermore, mobilisation should be done before the implementation of healthy workplace model in an attempt to get the support and opinion of stakeholders such as trade unions (Burton 2010:89). Management commitment and support for the implementation and sustainability of the healthy workplaces programme should be continually demonstrated (Burton 2010:90). Therefore, mobilisation assists the workers and employers to feel ownership of a healthy workplaces programme (Burton 2010:89; WHO 2010:20).

Step 2: Assemble

During this step, workers and resources are assembled to ensure the preparation for the changes needed in the implementation of healthy workplaces programmes (Burton 2010:90). The health and safety committee and OHS representatives should take a lead in communicating with workers and the management on issues pertaining to a healthy workplace (WHO 2010:21). In addition, the committee members or OHS representatives should be appointed from different job categories and all genders so that all sectors and categories are represented (WHO 2010; Burton 2010:89).

Step 3: Assess

The WHO healthy workplace model recommends an assessment of the situation regarding workers and the organisation. This includes an assessment of short term and long term OHS plans (Burton 2010:91). The situational analysis could be done in the form of a survey, an audit, inspection and focus group discussions. In addition, the gap identification should be done and goals set according to the outcome of the assessment (Burton 2010:91).

The collected information should include the demographic information, work-related disability, work-related illnesses and injuries, organisational productivity, staff turnover and risk assessment outcomes (WHO 2010:21). The management should also benchmark with similar organsations to check for similarities and learn lessons from good practices. A survey of workers asking for opinions on how the health at the workplace could be improvement is also of importance (WHO 2010:21; Burton 2010:90).

Step 4: Prioritise

An identification of gaps is followed by a setting up of priorities according to the given criteria (Burton 2010:92). The magnitude of the identified problem, cost for implementation and the potential outcome of the problem should be prevented (WHO 2010:22). Workers should be involved and their opinions should be considered.

Step 5: Plan

According to the WHO (2010:22), a comprehensive plan of OHS consisting of short term and long term plans should be set up. The plan should include the timeframe and responsible persons for certain tasks. Furthermore, the budget required for each task should be stated (WHO 2010:22).

Step 6: Do

This step requires the OHS interventions to be implemented by both the employer and workers in accordance with the plan's allocated responsibilities. In addition, a follow up should be conducted to ensure a successful implementation of the plan (WHO 2010:22).

Step 7: Evaluate

Evaluation is important to determine what has gone well and what has not. Short term and long term outcomes should be evaluated through surveys and audits to compare the results from baseline investigations (WHO 2010:23). The management should also talk to the workers to hear their views on the implemented programme (WHO 2010:23).

Step 8: Improve

The post evaluation results would tell if an improvement is needed to correct problems. If there is an improvement, workers should be commended and congratulated for a job well done (WHO 2010:25). However, if there is no improvement, the process starts again to ensure the achievement of a healthy workplace model (WHO 2010:25).

3.2.4 Co-principles of healthy workplace

A successful healthy workplace can be achieved through the consideration of key co-principles together with components of the WHO healthy workplace model (WHO 2010:26). The key co-principles are on the centre of the model (see figure 3.1) and these are: leadership, commitment and engagement, workers and representative involvement and organisation ethics and values.

3.2.4.1 Leadership commitment and engagement

The model highlights the need for management support and commitment in the integration of healthy workplace programmes into the organisation's mission, values and goals (WHO 2010:26). The management's commitment should also lead to the setting of the budgeting for a healthy workplace programme. The management's commitment also leads to the authorisation and development of a healthy workplace policy that should be signed by the most senior person in the organisation (Ling, Liu & Woo 2009:724).

Furthermore, the healthy workplace policy should be communicated to all workers and accessible to all workers in the organisation. Information should be shared between the management and workers for the latter to be involved from the beginning (WHO 2010:26). Hence, this study assesses the availability of OHS programmes at different construction sites in Windhoek, Namibia in accordance with the WHO healthy workplace model. The study's results were later used in the development of practical guidelines for the promotion of OHS in Namibia's construction industry.

3.2.4.2 Workers and representative involvement

Workers, their representatives and union leaders should be involved in each step of healthy workplace process in order to achieve a successful healthy workplace implementation strategy. In addition, workers' views should be noted, respected and considered for implementation (WHO 2010:26). Workers should be informed about their health and safety responsibilities, and the importance of preventing accidents and fatalities at work (WHO 2010:26). The study results from the questionnaires used during the study were applied in the development of practical guidelines. This shows the application of this aspect to the current study as the practical guidelines were developed on the basis of the study results.

3.2.4.3 Organisation ethics and values

The model stresses that management's support should be based on core values of the organisation and a consideration of professional ethics (WHO 2010:26). Workers and their representatives' involvement should be strengthened to monitor the progress of the programme and in identifying gaps. All the components of the model should be integrated for a healthy workplace sustainability (WHO 2010:27). In this context, the WHO healthy workplace model provides the theoretical framework for this study basing on construction site managers' willingness to work according to the values and ethics of the organisations in order to promote OHS among construction workers.

3.3 CONCLUSION

The chapter focused on the WHO healthy workplace model which is the foundation for this study. The chapter described the components of the WHO workplace model and showed how it should be integrated in OHS programme for a positive outcome with regard to the prevention of occupational diseases, accidents, injuries and fatalities in the construction industries. The chapter also discussed why a continual improvement process that promotes healthy workplaces and healthy workplaces co-principles should be integrated with the components to attain healthy workplaces.

The next chapter outlines the research methodology used in this study.

CHAPTER 4

RESEARCH DESIGN AND METHODS

4.1 INTRODUCTION

This chapter presents the research methodology followed during the execution of the study. It describes the study design, setting, population and sampling method, data collection methods, and data analysis methods. Furthermore, the chapter explains the ethical aspects related to the study and measures taken to ensure the validity and reliability of the study. The study was conducted to examine the socio-demographic profiles of workers, investigate the occupational health and safety hazards in the construction industry, review documents related to occupational accidents, injuries and diseases in the construction industry, and unpack the occupational health and safety legislative provisions and compliance among construction sites in Windhoek, Namibia. The ultimate purpose of the study was to develop evidence-based practical guidelines that promote the occupational health and safety of workers in construction industries of Windhoek, Namibia.

4.2 RESEARCH DESIGN

A quantitative, descriptive and contextual approach was applied in this study. A cross-sectional analytical design was used to assess the occupational health and safety situations, prevalent hazards, occupational accidents, and injuries and diseases prevalent in the construction industry in Windhoek, Namibia. The chosen study approach enabled the researcher to plan the strategies to conduct the study and enhance the study integrity as explained in detail in the next sub-sections.

4.2.1 Quantitative study approach

A quantitative approach was used in this study to describe the occupational health and safety hazards, accidents and injuries and occupational diseases in the construction industry in Windhoek. The quantitative approach was also used to obtain information about the construction industry's health and safety situations using structured data collecting instruments such as questionnaire, a site inspection checklist and a document review checklist. In addition, the study obtained the socio demographic profile of the construction workers. The use of a quantitative study approach enabled the researcher to describe the characteristics of the occupational health and safety situations in the construction industry in Windhoek, Namibia.

Furthermore, numeric quantifiable data was collected from all thirteen construction sites and 549 out of the 1097 construction workers who were willing and availed themselves to participate in the study. The results for this study could be generalised to the construction industry with similar characteristics and context. The use of a quantitative study approach assisted in the gathering of data pertaining to OHS in the construction industry in Windhoek so that numerical data could be generated using statistical software programme during data analysis.

4.2.2 Descriptive, cross- sectional design

A descriptive, cross-sectional design, which is contextual in nature, was used in this study. The approach investigated and described the occupational health and safety hazards, occupational injuries, occupational accidents and occupational diseases evident on different construction sites in Windhoek. A cross-sectional design was used to enable the researcher to collect the data at once and get an overall picture of the occupational health and safety conditions in the construction industry at one point in time. The researcher applied a contextual study design to collect data from the respondents in their own working environment, which are the construction sites in Windhoek, Namibia.

Furthermore, the researcher engaged in observations of the construction sites and participants to evaluate the OHS provision, practices and compliances such as the presence of occupational hazards on sites and presage among construction workers. In addition, the researcher reviewed the documents in order to determine the occupational hazards, accidents and injuries from the respective construction sites and occupational accidents, injuries and diseases from the Ministry of Labour, Industrial relations and Employment creation.

4.3 RESEARCH METHOD

The research method used in this study is described hereunder:

4.3.1 Study setting

This study was conducted on construction sites in Windhoek, Namibia, among the construction sites, construction workers, and reviewed documents related to reported accidents, injuries and diseases from the construction industry. The city of Windhoek's municipality was selected because of its increasing construction industries. Windhoek is the capital city of Namibia situated in Khomas region on the central part of Namibia, as shown in figure 4.1.

Figure 4.1 Map of Namibia depicting the location of Windhoek, Namibia

(Source: www.google.com.na/maps/)

4.3.2 Study population

The study population in this study consisted of 13 construction sites and 1 097 construction workers in the Windhoek construction industry, who were available during data collection time and agreed to participate in the study, and all documents on reported occupational accidents, injuries and diseases. There were15 construction sites operating during the study, however two construction sites were used for pilot test of the questionnaire, site inspection checklist and section one for document review checklist and had to be excluded from the main study, thus leaving 13 construction sites to participate in the main study for data collection using questionnaires. However, out of 13 construction sites, only ten construction site managers authorised the researcher to conduct the site inspection and document review using site inspection checklist and section one for document review checklist.

The section one of the document review checklist was used to assess the OHS documents on the targeted construction sites. The review was also used to assess the magnitude of occupational accidents, injuries and diseases as documented in the Ministry of Labour, Industrial relations and Employment creation 5 years' records of reported occupational accidents, injuries and diseases from the construction sites of Windhoek, Namibia. Therefore, the researcher included three target populations in this study, namely, the 13 construction sites, 1 097 construction workers employed in all the targeted construction sites and all documents regarding reported occupational accidents, injuries and diseases such as accident registers, injury registers and notification forms. The sample of the population participated in the study is described in the following subsection.

4.3.3 Sample and sampling

A three-staged sampling was used in this study, whereby all 13 study sites (construction industries operating in Windhoek, Namibia) were sampled and all workers in all 13 construction sites were included in the study.

The sample of construction workers consisted of a list of construction workers from 13 construction sites and documents from different 10 construction sites and documents regarding reported occupational accidents, injuries and diseases from the Ministry of Labour, Industrial relations and Employment creation. The study's three stage sampling consisted of construction site sampling, participant sampling and the sampling of review documents. Census sampling was used in all three stages due to the limited sites, participants and documents.

4.3.3.1 Sampling procedure

The limited number of construction sites that were in operation in Windhoek at the time of conducting the study lead to the inclusion of all available 13 construction sites in the study. In addition, all the 1 097 construction workers from the 13 construction sites were included in the study, although only 549 construction workers participated in the study. Furthermore, all documents regarding reported occupational accidents, injuries and diseases as well as injury registers and notification forms from Windhoek's construction industry available at the Ministry of Labour, Industrial relations and Employment creation for the period of 2011/2012 to 2015/2016 financial years were included in the sample for review.

4.3.3.1.1 Site sampling

The researcher identified construction sites located in Windhoek that were operating at the time when the study was conducted by obtaining the data base from the city of Windhoek municipality. There were thirteen construction sites with operating projects, apart from the two that the researcher used for piloting. Since this is a very small number, all thirteen construction sites were included in the study using a census sampling method.

4.3.3.1.2 Participant sampling

A census sampling technique, which included all 1 097 construction workers was used in this study whereby in order to get valuable quantifiable study results. The researcher was compelled to use census sampling due to the existence of a limited number of construction workers and the reality that no research had been conducted yet in the Namibian context to investigate the occupational health and safety status in the construction industry. The list of all construction workers was obtained from the different construction sites and used as a sampling frame. The use of census sampling allows a researcher to get accurate research data, in this case data regarding OHS situation in the Windhoek construction industry. Table 4.1 outlines the construction sites that were used as study sites, their geographic location and the total number of construction workers per site. However, only participants who were available and willing to take part in the study were included in this study.

Table 4.1 Total number of construction workers per construction site (N=1097)

No	Construction site code	Total number of construction workers
1	Construction site 1	112
2	Construction site 2	70
3	Construction site 3	68
4	Construction site 4	48
5	Construction site 5	27
6	Construction site 6	40
7	Construction site 7	38
8	Construction site 8	296
9	Construction site 9	70
10	Construction site 10	150
11	Construction site 11	64
12	Construction site 12	54
13	Construction site 13	60
	TOTAL	**1 097**

4.3.3.1.3 Document review sampling

A retrospective review of documents on occupational accidents, injuries and diseases from all ten construction sites were obtained from the site managers of different construction sites whose managers had agreed that their sites take part in the document review process. The three construction sites where site managers did not agree for document reviews are, construction site two, construction site eight and construction site 13. The researcher approached the Ministry of Labour, Industrial relations and Employment creation, the Ministry of Health and Social Services of Namibia and the Social security commission of Namibia to request the documents for review regarding occupational accidents, injuries and diseases from the Windhoek construction industry. However, the researcher was only able to get the data on the construction industry's reported occupational accidents, injuries and diseases from the Ministry of Labour, Industrial relations and Employment creation. The data regarding reported occupational diseases from the construction industry in Windhoek was not provided to the researcher as it was not recorded.

All documents for the duration of five years, from April 2011 to March 2016, regarding occupational injuries, accidents, and diseases were reviewed to get the magnitude of the occupational injuries, accidents and diseases in Windhoek, Namibia.

4.3.3.2 Inclusion criteria

4.3.3.2.1 Inclusion criteria for construction sites

The study's inclusion criteria for construction sites was all construction sites in the Windhoek city's municipality with projects running during data collection time, from October 2014 to March 2015.

4.3.3.2.2 Inclusion criteria for construction workers

All construction workers who were available on construction sites with projects running at different construction sites in Windhoek during data collection time were included.

4.3.3.2.3 Inclusion criteria for documents

The inclusion criteria for document review was all available documents regarding OHS at construction sites participating in the study and all documents regarding reported occupational accidents, injuries and diseases from Windhoek's construction industry, for the period April 2011 to March 2016.

4.3.4 Development and characteristics of data collection tools

Data collection tools were developed to gather data among the three groups of study populations. The tools were based on the study objectives, reviewed literatures and the theoretical framework, the WHO healthy workplace model (WHO 2010). These data collection tools were a questionnaire, site inspection checklist and document review checklist. The researcher's development of the data collection tools considered the relevance of the content, concepts and ensured that adequate high quality data would be collected. Finally, the data collection tools were reviewed by an OHS expert and the research supervisor to ensure their validity and reliability. Furthermore, the data collection tools were piloted before the main study (see 4.3.5). The nature of data collection tools is described hereafter:

4.3.4.1 Questionnaire

The interviewer-led questionnaire was chosen because it enabled the researcher to collect data using consistent questions and to increase the response rate as interviewer-led questionnaires are known to have higher response rate. Furthermore, interviwer-led questionnaire enabled the researcher to clarify more should the participants have raised questions during data collection.

The main content included close ended questions which deal with occupational health and safety as described hereunder. The researcher used plain language and ensured that the question sequence was optimal. The questionnaire was translated to an African language "Oshiwambo", as the majority of construction workers speak either Oshiwambo or English. The questionnaire was developed with mostly fixed responses of, "yes" or "no" answers to enable a quantitative analysis. However, one open ended question was included at the end of the questionnaire to allow the respondents to make comments about how to/ promote OHS in Windhoek's construction industry. A questionnaire with 49 items, informed by the study objectives and seeking to ensure that data could be analysed quantitatively, was developed by the researcher to collect data among workers in the construction industries targeted for this study (see Annexure G). The questionnaire consisted of six sections.

- **Section 1: Personal health resources**

This section included questions about personal health resources such as the participants' socio-demographic information which include age, marital status, level of education, type of work and employment types.

- **Socio-demographic characteristics questions**

The socio-demographic questions asked for data on such as age, gender, and marital status, level of education, type of work in the construction industry and employment type.

The questions in this sub-section were aimed at summarising and describing the social and demographic characteristics of the participants and to assess whether these characteristics could influence the OHS awareness and practices of individuals.

- **Section 2: Occupational health and safety awareness**

Data collected from section two of the study questionnaire focused on the participant's awareness of OHS existence, workplace emergencies and that of first aid provision.

- **Construction worker's occupational health and safety awareness questions**

The questions in this sub-section aimed at assessing the participant's awareness of (i) the availability of OHS documents such as OHS policies; (ii) whether OHS documents were placed within workers access; (iii) whether participants had received OHS training at their workplaces during the current construction project; (iv) the existence of health and safety representatives at workplaces; (v) appointment health and safety officer/s at the construction sites (vi) whether participants had attended safety talks at workplaces; and (vii) reaction practices if accidents occur at workplace. This allowed the researcher to assess whether participants were informed about the availability and provision of occupational health and safety at workplaces.

- **Questions concerning the awareness of participants on emergency preparedness and first aid services**

The questions were meant to assess: (i) if workers had received emergency training at work; (ii) availability of emergency plans at workplaces; (iii) availability of first aiders at construction sites; and (iv) whether respondents knew where the first aid kits were placed. These questions were aimed at assessing the provision of OHS services seeking to prevent disasters in cases of emergency at workplaces.

- **Section 3: Occupational hazards on the construction sites**

- **Presence of occupational hazards on the construction sites questions**

The question determined the common (A) physical hazards such as (i) noise, (ii) dust, (iii) vibration and (iv) chemical hazards such as paints. Furthermore, the question asked about the presence of (B) psychosocial hazards such as (i) discrimination, and (ii) victimisation.

- **Awareness of hazard reporting and control**

Participants were asked to indicate whether they were aware of where to report any identified hazards. These questions were aimed at determining the presence and prevalence of hazards in the construction sites.

- **Section 4: Occupational accidents on the construction sites**

The questionnaire asked if the following accidents ever occurred on the construction site (i) falls from above, (ii) electrocution, (iii) being struck by moving vehicles, (iv) being cut by machinery, (v) being struck by falling objects, (vi) motor vehicle crashes and (vii) trench burying. These questions sought to examine the occurrences of occupational accidents on the construction sites of Windhoek, Namibia.

- **Section 5: Self-reported health problems**

The questions in this section asked if participants had ever experienced health problems such as (i) back pain, (ii) difficulty in breathing, (iii) skin problems, and (iv) difficulty in hearing, during the six months prior to the research. These questions were aimed at finding out the frequencies of health problems experienced by the participants. The participants were also asked if they ever had medical examinations at work during the current construction project. The researcher was also interested in finding out whether medical examinations were provided at workplaces to assess compliance with OHS legislation and the associated early identification of diseases and provision of treatment to prevent complications.

- **Section 6: Occupational health and safety provision on the construction sites**

In this section, participants were asked questions regarding the provision of OHS such as welfare facilities provision, PPE provision and usage, enterprise community involvement and construction industry OHS improvement, on the construction sites.

- **Provision of welfare facilities at workplace questions**

The questionnaire sought to find out if: (i) toilet facilities were available at work places; (ii) toilets were demarcated for male and female workers and; (iii) if hand washing soap was available in the toilets. Furthermore, the questionnaire asked if: (iv) workers were getting rest breaks during lunch time; and (v) rest rooms were available and (vi) if designated smoking areas were available. These questions were meant to inform the researcher about whether construction workers were provided with welfare facilities at work for health and hygienic purposes.

- **Personal protective equipment (PPE) questions**

The questions regarding personal protective equipment (PPE) were meant to assess if (i) PPE were provided at work places; (ii) construction workers were requested to pay for their PPE; (iii) PPE fits well and (iv) whether construction workers feel comfortable when wearing PPE. Furthermore, workers were asked to state (v) if they received replacements for worn out PPE; and whether (vi) Workers were using PPE regularly during their performance of duties. The respondents were asked to indicate yes or no on the questions assessing the provision of OHS on the construction sites and the participants' compliance with PPE use.

- **Questions regarding enterprise community involvement**

The questions asked if (i) workers had received waste disposal training; (ii) workers were provided with transport to and from work; and (iii) whether participants were provided with medical aid services. The questions were aimed at assessing whether the construction industries were performing any community work that improved the health and social status of the community where they were operating as a matter of OHS provision.

- **Occupational health and safety (OHS) promotion**

The questions in this section asked whether participants were of the view that (i) something could be done to improve OHS in the construction industry, followed by open ended questions for respondents to state (ii) what could be done to improve OHS in the construction industry. The researcher gave the participants a chance to indicate any changes which they thought could improve OHS in the construction industry. More suggestions could be gained since this was an open ended question and this would assist researcher in the development of practical guidelines that improve OHS in the construction industries.

4.3.4.2 Site inspection checklist

The checklist was developed by the researcher to assess the working environment and construction workers' activities regarding OHS practices. The site inspection checklist was designed with 63 close ended questions and statements whereby the participants had to tick on "yes or no" indicating whether what was being measured was available or not. A majority of the questions were similar with those in the questionnaire and this was meant to supplement the results from the questionnaires. The checklist was only designed in English as it was only used by the researcher who can converse in English. All the questions and statements on the checklist aimed at addressing the research problem. Finally, the checklist was made up of three sections as follows:

➢ **Section 1: Occupational health and safety practices on the construction sites**

- **Personal protective equipment (PPE) on the construction sites**

The questions in section 1 assessed the participants' personal protective equipment practices.

- **Personal protective equipment (PPE) questions**

The researcher checked against the checklist and ticked on the appropriate yes or no column. The questions asked about whether (i) construction workers put on personal protective equipment; (ii) PPE was in good condition (not worn out); and (iii) whether the company kept a list of workers trained on the use of PPE. These questions were aimed at obtaining information about the workers' OHS practices and provision of PPEon site.

➢ **Section 2: Occupational hazards on the construction sites**

Questions in this section determined the presence of occupational hazards and aspects related to hazard identification and control. All questions in this section aimed at assessing the presence of different occupational hazards and control measures practiced for hazard control.

- **Presence of occupational hazards on the construction sites**

The construction sites were inspected to identify different types of hazards such as (i) physical hazards including noise, dust, vibration and non-ionized radiation, (ii) chemical hazards which include gases, fumes and paints and (iii) ergonomic hazards including repetitive motion, awkward postures and the lifting of heavy loads.

- **Hazard identification and control questions**

The questions in this sub-section focused on (i) safety checks carried out before work commences; (ii) systems in place to manage hazards and risks; (iii) surveys conducted to determine the noise level on the construction site; (iv) safety measure put in place to control vibration; (v) the existence or non-existence of incident notification mechanisms. Furthermore, the questions asked are: (vi) Are there measures in place to prevent generation of dust in the construction site? (vii) Is there a waste management policy for the prevention of environmental pollution? These questions aimed at assessing the provision of hazard control measures on construction sites.

- **Section 3: Occupational health and safety provision on the construction sites**

Questions in this section determined OHS aspects such as occupational health and safety management, provision of welfare facilities in the construction sites, electric safety, work equipment safety, emergency preparedness, first aid provision, and fire safety services. All questions in this section were aimed at assessing the implementation of OHS at respective construction sites to determine compliance towards OHS legislations.

- **Occupational health and safety management implementation**

The questions on health and safety management aimed at finding out about the:(i) appointment of health and safety officer on the construction site; (ii) existence of health and safety committees and (iii) whether any labour inspector had checked the site since commencement of the project and (iv) the existence and nature of people and transport movement control on the site. These questions sought to assess compliance towards OHS legislations.

- **Questions regarding the provision of welfare facilities**

Questions regarding welfare facilities in the construction sites were:(i) Are toilets adequate for male and female as per regulation No 156 (2007), depending on number of workers; (ii) Are change rooms available; (iii) are there rest rooms; (iv) Is there any smoking designated area; (v) Is drinking water available away from the toilet. The purpose of these questions is to find out if workers are being provided with hygienic facilities as part of OHS provision and OHS legislative compliances.

- **Questions about electric safety questions**

The checklist consists of questions regarding electric safety in this sub-section. The questions included: (i) Is there any notice prohibiting unauthorised persons from handling or interfering with electric apparatus? (ii) Are plugs, sockets, extension cords and electrical equipment defect or damaged? (iii) Are electrical conductors protected by insulation? (iv) Is the electric switchboard always closed and under locked; (v) Are electrical conductors grounded? (vi) Is there any instruction on emergency isolation switch and supply cutting? (vii) Are electrical wires lying in water? (viii) Are portable electrical equipment safely checked and labels attached for next inspection? (x) Are electrical cables clear from walkways? These questions were aimed to determine the construction sites' compliance towards OHS.

- **Questions about the safety of work equipment**

The questions about the safety of work equipment aimed at identifying whether measures were being taken to prevent accidents resulting from hazards associated with the equipment used at workplaces. The questions on the checklist were: (i) Are ladders in good condition and not damaged? (ii) Are machines guarded? (iii) Are user instructions available for machinery equipment? iv) Are inspection records on work equipment kept on site?

- **Emergency preparedness on the construction sites**

The questions in this section were aimed at assessing the preparation practices in case of an emergency, thus showing OHS compliances. The questions were: (i) Does the construction site have an emergency plan? (ii) Is the list of telephone numbers for the police, ambulance and department displayed on the station? and (iii) Is there a register for available emergency equipment?

- **First Aid arrangements questions**

The questions in this sub-section aimed at finding out if there were any arrangements in place in case of emergencies at workplaces as required in OHS provision. The questions were: (i) Is there a first aid station on the site? (ii) Are there first aid kits on sites? (iv) Are certified first aiders available? (v) Are first aid manuals available? (vi) Is there any written procedure for transporting injured workers to the hospital? And (vii) Is the first aid register kept on the site?

- **Questions about fire safety**

The questions regarding fire safety were: (i) Are fire prevention procedures in place? (ii) Are instructions informing the workers what to do in case of discovering fire posted? (iii)

Is there an appointed fire warden who coordinates fire activities? (iv) Are fire drills performed and recorded for workers to know what is required in case of fire? (v) Are fire extinguishers available? (vi) Are fire extinguishers not expired? (vii) Are workers trained on how to use fire extinguishers? (viii) Is the emergency escape route kept clear? (x) Is the assembly point known to all workers for evacuation procedures? These questions were aimed at verifying the existence of fire prevention and emergency procedures for OHS compliance purposes.

4.3.4.3 Document review

A document review provided the third source of data. The researcher developed a checklist, such as the availability of OHS related documents e. G. OHS policy, to investigate the provision of OHS on the construction sites. Furthermore, the researcher reviewed the documents pertaining to occupational accidents, injuries and diseases from the Ministry of Labour, Industrial relations and Employment creation of Namibia for the duration of five years, from April 2011 to March 2016.

4.3.4.3.1 Document review checklist characteristics

The document review checklist was used to assess the documents on the construction sites and documents regarding OHS accidents, injuries and diseases reported at the Ministry of Labour, Industrial relations and Employment creation in Namibia. The data from the document review supplemented the data obtained from that collected by the workers through the questionnaire and from the site inspection checklist. The document review checklist consisted of three sections: section 1 assessed the documents at the construction sites, section 2 reviewed documents regarding reported occupational accidents and injuries, and section 3 reviewed documents pertaining to reported occupational diseases. A brief overview of the sections is described below.

➢ **Section 1: Construction site document review**

Section 1 focused on an inspection of the construction sites' different documents about personal health resources, hazard identification and control, occupational health and safety management provision, OHS induction and training and documents about the psychosocial work environment.

- **Personal health resources-related documents on the construction sites**

The statements on personal health resources were based on issues such as (i) Job descriptions available for each job categories; (ii) Health and safety responsibilities stated in the job descriptions; (iii) If the company kept pre-employment medical questionnaire filled by each worker; and (iv) availability of pre-employment screening reports; (v) availability of names and positions of workers with their specific health and safety responsibilities (vi) availability of PPE provision lists. A review of the documentation on such issues aimed at determining the legislative compliance of construction sites on OHS.

- **Documents on hazard identification and control on study sites**

The questions in this sub-section aimed at determining the availability of documents regarding hazard identification and control. The questions were: (i) Is there any accident or injury register on site? (ii) Are accident investigation procedures available? (iii) Are injury on duty report forms available? (iv) Are incident reporting procedures available? (v) Is there any document indicating that workplace inspection is carried out regularly? (vi) Are checklists used for workplace inspection available? (viii) Are procedures for action after inspection findings available?

- **Occupational health and safety management provision questions**

Questions in this sub-section focused on the provision of occupational health and safety management. The purposes of these questions was to assess OHS compliance. The questions were as follows: (i) Is there a health and safety policy statement? (ii) Is the approval letter for construction work by the Ministry of Labour, Industrial relations and Employment creation available? (iii) Are copies of the Labour Act 11, 2007 available? (iv) Are copies of Regulations relating to the health and safety of employees at work (No 156 2007) available? (v) Is a health and safety plan for the project available? (vi) Does the plan state clearly the scope of work? (vii) Are major activities described? (viii) Are types of work described? (ix) Are safe working procedures available? (x) Is the company’s safe work procedure relevant to the project? (xi) Are safety box minutes present? (xii) Are medical surveillance reports available? (xiii) Are the sickness absence monitoring procedures available? (xiv) Is there any smoking policy? (xv) Is a job risk assessment policy available?

- **Documents related to occupational health and safety induction and training questions**

The questions in this sub-section were: (i) Are induction procedures for new employees stated? (ii) Are induction modules or induction course contents available? (iii) Does the company keep signed registers of workers who would have completed the induction program? (iv) Are registers for periodic safety and health training available? and (v) Are training registers signed by trained workers? The aim of these questions was to assess for OHS provision on induction and training related aspects.

- **Documents regarding the psychosocial work environment**

The questions in this sub-section focused on the psychosocial work environment. The researcher assessed the policies regarding psychosocial work environment by asking the following questions: (i) Are documents for stress management policy available? (ii) Is there a policy for rewarding workers on health and safety promotion? (iii) Is there a policy preventing harassment at work? (iv) Is there a policy preventing the stigmatisation of HIV infected workers?; (v) Is there a policy preventing ethnic group discrimination? (vi) Are there policies allowing workers to register with trade unions? (vii) Is there a policy preventing bullying at work? (viii) Is there a policy preventing discrimination on religious diversity? and (x) Is there a wellness policy available on site? The purposes of these questions was to assess OHS provision and the integration of the physical and psychosocial work environment.

- **Section 2: Documents regarding notified occupational accidents and injuries in Windhoek's construction industry**

Section 2 of the document review gathered data regarding reported occupational accidents and injuries from Windhoek's construction industry. The aim was to determine the magnitude of occupational accidents and injuries in the construction industry in Windhoek, Namibia. The information collected from the documents include the sex and age of the injured worker, worker's occupation, date of accident, nature or severity of the accident, source of accident, worker's body part injured and the nature of the injury.

- **Section 3: Documents regarding reported occupational diseases from Windhoek's construction industry**

Section 3 assessed the records of reported occupational diseases from Windhoek's construction industry. The questions in this section were aimed at obtaining information and the extent of occupational diseases in the Windhoek municipality's construction industry. The questions focused on the worker's sex, age, occupation, occupational disease and the date when the occupational disease was diagnosed. The records review here sought to obtain data about the prevalence of occupational disease in the construction industry of Windhoek, Namibia.

4.3.5 Pilot testing of data collection tools

The pilot test of the site inspection checklist, questionnaire and document review checklists was carried out in order to rule out any problems with the questions' format and limitations in the responses. Furthermore, piloting was conducted to improve the reliability and validity of data collection tools and to incorporate comments from the participants in to the final revised data collection instrument. The researcher ensured that piloting was conducted on the construction sites and among construction workers with similar characteristics to those participating in the main study.

The pilot study was conducted using sixteen construction workers from two construction sites for interviewer-led questionnaire and with two construction sites among 15 construction sites for site inspection checklist and for section one of the document review checklist. The piloting for the sections 2 and 3 document review checklist was carried out on the documents for a two-year period, 2009/2010 to 2010/2011, regarding occupational accidents and injuries from the construction industry in Oshakati, Namibia, which were obtained from the Ministry of Labour, Industrial relations and Employment creation. The researcher ensured that the two construction sites and sixteen construction workers who participated in the pilot testing were not included in the main study. These sixteen construction workers were randomly selected using simple random sampling. The construction sites used for piloting were selected using convenience sampling due to the limited number of construction sites. The actual pilot testing was conducted by the research in September 2014. Information from the pilot study was scrutinised and data collection tools were adjusted accordingly. After the pilot study, some questions were rephrased for clarity. The pilot study results are not included in this study's report.

4.3.6 Data collection approach and method

A written permission to conduct the study on all the 13 specified construction sites was obtained from site managers (see Annexure E). The letters were delivered physically by the researcher herself. The letters for ethical clearance from UNISA and from the Khomasdal Regional Council were attached (see Annexure A and D). A written permission to conduct the study was obtained from the construction site managers and the researcher given focal persons to arrange with the date and time for data collection. The times for site inspection and document review were also organised with the site managers or the focal persons appointed by site managers. The document review (sections 2 and 3) involved obtaining the approval to carry out the research from the Permanent Secretary of the Ministry of Labour, Industrial relations and Employment creation and an arrangement, by the researcher and the Chief Inspector from the Directorate of Occupational Health and Safety regarding data collection times.

All 1 097 construction workers from the 13 construction sites were approached for data collection. However, only 549 participated, giving a response rate of 61.4% for interviewer-led questionnaire with 548 construction workers refusing to participate in the study. There were many participants who were identified by the focal person at some construction sites and this resulted in interviews which went on for more than one day. Furthermore, only 10 construction site managers authorised the researcher to conduct the site inspection and document review in the respective construction sites.

Data was collected by the researcher from the 13 construction sites and all construction workers over a period of six (6) months, from October 2014 to March 2015. However, the data from a retrospective document review regarding occupational injuries, accidents and diseases from the Ministry of Labour, Industrial relations and Employment creation in Namibia for the 5-year period considered in the study, was collected from October 2014 up to April 2016. The data collection was limited to construction industries in the Windhoek municipality.

4.3.6.1 Administration of interviewer-led questionnaire

Questionnaires were administered by the researcher at each of the participating construction sites on the time agreed upon by the site managers and participants. The purpose of the study was explained and confidentiality was guaranteed. Before data collection could start, each participant was given a consent form to read and sign indicating their understanding of the study purpose and its conditions and agreement to participate in the study. The signed consent forms were placed in a box separate from the questionnaire to maintain anonymity, and this was followed the researcher's interviewing participants. Questionnaires were also provided after each interview and the filled questionnaires were put in the provided box. The researcher ensured that the boxes for consent and completed questionnaires were sealed after each day of data collection.

Interviews, with each lasting for 20 to 35 minutes, were conducted in English and Oshiwambo as the researcher is well conversant with both languages. The researcher collected the data during working time as per arrangement with the site managers. The interviewer-led questionnaires were used in order to increase the response rate. Participants were informed that their names would not be written on the questionnaires to maintain anonymity.

4.3.6.2 Conducting site inspections

A site inspection checklist was used by the researcher to inspect the construction sites for provision of OHS and the construction workers' operational practices. The researcher agreed with site manager on the time that was convenient for site inspection. A site inspection checklist was used at ten construction sites as only ten construction site managers had agreed to the conducting of the site inspection at their respective construction sites.

4.3.6.3 Conducting the document review

The researcher arranged a convenient time for document review with the site managers after obtaining the approval from construction site managers to review the documents. A document review checklist (Section 1) was used by the researcher to check the availability of documents, such as OHS policies, at the construction sites (see Annexure I) with running projects in the Windhoek municipality. Documents were reviewed at 10 construction sites because only 10 construction site managers had agreed to the document review.

Retrospective document review was also conducted to investigate reported occupational accidents, injuries and diseases in the construction industry in Windhoek (see section 2 and 3 of document review checklist). The researcher retrieved the document archives of 5 years from April 2011-March 2016 of the Ministry of Labour, Industrial relations and Employment creation and the Ministry of Health and Social Services after receiving permission from the Permanent Secretaries respectively (see Annexures B and C).

4.3.7 Data management process

The researcher ensured that strict data management measures were practiced to ensure that the entire research process upholds the rights, privacy and confidentiality of the participants. The participants' informed consent was obtained and the interviews were carried out in offices provided by the site managers, thus ensuring the privacy and confidentiality of the respondents. The researcher ensured that the environment was conducive, quiet and without distractions such as phone calls.

A professional statistician, used to analyse the data, gave consent to keeping the information confidential. The post-data collection process involved a process of data collection tools review and numerical coding. Data from questionnaires, document reviews and site inspection checklists were entered in the SPSS software program version 23.0 separately so that each data collection tool had its own data set. The data entry, which lasted for eight weeks, was performed by the researcher in a private office to prevent other people from having access to the documents. Finally, databases were also created and cleaned for missing data before running the statistical analysis.

It should be underscored that the researcher ensured the accuracy of data entry by making a double entry and verifying whether there were differences in data sets from similar tools. Data that differed during double entry were cross-checked against the data collection instrument concerned and problems rectified. After data entry, all data collection tools and consent forms were kept under locked cabinets and only accessible by the statistician and the researcher. The researcher kept datasets in the computer protected with the password only known by the researcher and the statistician. The data collection tool will be kept in a locked cabinet for five years and can be destroyed by the researcher after five years.

4.3.8 Data analysis method

The researcher ensured quality control during data collection and data analysis. The standardised data collection tools that were used were pre tested before the main study. In addition, the researcher monitored the day to day activities of data collection.

Data was systematically organised to reduce, synthesis and make it meaningful during data analysis. The data collected from the three data collection tools were analysed quantitatively using statistical procedures to describe the phenomena and assess the magnitudes among variables. The researcher used the Statistical Package for Social Science (SPSS) version 23.0 (SPSS Inc. Chicago, Illinois, USA) computer program to perform these analyses. Raw data was reviewed initially for consistency and completeness with the missing values verified against the source. The data was entered into Statistical Package for the Social Sciences (SPSS) 23.0. The researcher was assisted by a professional statistician to carry out the data analysis using the Statistical Package for the Social Sciences (SPSS) 23.0 Windows version computer assisted data analysis software.

Descriptive statistics was used to categorise and describe the socio-demographic variables, categorical variables related to occupational hazards presence, hazard reporting and control, occupational accidents and injuries, self-reported occupational related health problems and occupational health and safety legislative provision and practices. In fact, the data were summarised using frequency distributions, percentages for categorical variables and, the mean, standard deviation, mode, maximum and minimum values for continuous variables.

Descriptive statistics were used in the data analysis. Finally, practical guidelines, based on the study findings, were developed to guide the development of interventions for promoting OHS in the construction industry in Windhoek, Namibia.

4.4 VALIDITY AND RELIABILITY

The issues relating to the validity and reliability of the study design and data collection tools used during this study are discussed below:

4.4.1 Validity and reliability of the study

Validity was ensured throughout for truth and accuracy for the study to measure what it is supposed to measure. The study used a descriptive study design so that the results could be generalised. In addition, all three data collection instruments were pretested before use and corrections made in the final versions. External validity of the study was ensured through the recruitment of all the 1 097 construction workers to participate in the study so that the study results could be generalised to the whole population of Windhoek construction industry. All 13 available construction sites, with activities during the data collection period, were included due to the availability of limited number of construction sites. All documents regarding reported occupational accidents and injuries for the study's set period of 5 years were included in the study.

4.4.2 Validity of the research instrument

The researcher considered the validity of the research instrument, to ensure the instrument is able to measure what was expected to. The content validity, predictive validity and constructive validity of the research instrument are each described below:

- **Content validity**

Content validity, which refers to the appropriateness of the content of a data collection tool, was considered during the development of data collection tools. The data collection tools were reassessed by the researcher and the research supervisor to ensure that the content was related with OHS in the construction industry. In addition, the researcher conducted a review of literatures pertaining to OHS in the construction industry in order to construct data collection tools with OHS measurable contents. The research questions were also based on study objectives and the WHO healthy workplace model- theoretical framework of the study. The data collection tools were piloted, and then the proposed changes were incorporated according to the feedback from the pilot testing.

- **Construct validity**

Construct validity was censured by identifying concepts in the study and defining them operationally. Literatures pertaining to OHS in the construction industry were reviewed and related concepts identified and given operational definitions.

4.4.3 Reliability of the study instrument

Reliability refers to the ability, accuracy and consistency of a study instrument (Denscombe 2010:298). Reliability was ensured during this study through using the same data collection tools on participants. In fact, the same questionnaires were used for all participants and the same site inspection checklist and document review checklist were used at all construction sites which participated in the study. Piloting of the data collection instruments was conducted before data collection to ensure reliability and corrections were made when necessary. The researcher arranged the suitable time for data collection with the site managers to avoid interruption of participants during data collection.

The data collection tools were designed to measure what they were designed to measure from participants with the same characteristic during the data collection period. The researcher was able to clarify questions if the respondents needed further clarifications. Participants who could not understand English were interviewed in the vernacular Oshiwambo, which they could understand.

4.4.4 Ethical considerations related to the study

Ethics guide the researcher's conduct in a study throughout the process from the identification of a research topic to the publication of the study result. Ethical principles were followed before, during and after the study. The ethical issues considered in this study are protecting the rights of both the participants and institutions. As this was a research involving human subjects, the researcher obtained an ethical clearance from the University of South Africa (UNISA) ethical committee before data collection process (see Annexure A). The researcher also sought and obtained permission from the site managers of the construction sites which participated in the study before data collection (see Annexure E). Permission was also requested for and granted to use the data regarding the study from the Ministry of Labour, Industrial relations and Employment creation of Namibia and the Ministry of Health and Social Services of Namibia (see Annexure B and C). In addition, the researcher sought and obtained permission from the Khomas Regional Council as Windhoek is located in the Khomas region and regional council offices should sanction any research activities taking place in the region (Annexure D). No rewards were given to the participants.

4.4.4.1 Protecting the rights of the participants

During this study, human subjects were used to collect the data pertaining to OHS in the construction industry. Therefore, the researcher adhered to the ethical aspects, such as informed consent, right to privacy, right to autonomy, right to anonymity, confidentiality, justice and right to prevent harm, regarding human rights. The researcher explained to the participants that they have the right not to participate or to answer some questions without being punished. The following ethical aspects were applied during the study:

- **Informed consent**

Informed consent provides participants with enough information before they respond to the study and allows them to make an informed choice to either agree or decline to participate in the study. The researcher requested permission from the site managers of the construction sites with running projects during data collection time to conduct the study in specific construction sites. The researcher got the written permission from site managers of different construction sites before data collection and the time for data collection was agreed upon.

The purpose of the study was explained to the participants by the researcher before the initiation of data collection process. In addition, all participants were informed about the aim of the study and they were given enough time to read the informed consent letter and to ask questions before they agree or disagree to take part. The informed consent letter (see Annexure F) consisted of information regarding the purpose of the study, ethical aspects such as anonymity and confidentiality and where the participants had to sign if they agreed to take part in the study. The translation of the informed consent letter to "Oshiwambo" was performed by the researcher for the participants who could not understand English. Thereafter, participants were requested to sign the informed consent letter to get permission to participate in the study.

The consent forms and the questionnaires were separated and stored separately after the workers had signed in agreement to avoid linking the responses to the workers signature.

- **Privacy and anonymity**

The researcher used number codes on the questionnaires, site inspection checklist and on the document review checklist during data collection to maintain anonymity and privacy of the research participants and participating construction sites. Informed consent letters were kept unattached to the questionnaire so that the participant's responses could not be linked to the signature on the informed consent letter. In addition, participants were informed not to write their names on the questionnaires to maintain privacy and anonymity and make sure that they could not be linked to answers.

Furthermore, construction sites were coded and no construction site name was mentioned during data analysis. Finally, the completed data collection tools are kept in a locked cabinet and will be kept there for five years with the researcher only having access to ensure privacy of the collected data.

- **Autonomy**

The principle of autonomy was applied during the study to give participants the freedom to decide what they wanted to do. Participants were informed about both the aim of the study and whether to choose voluntarily if they wanted to participate in the study or not. The participants were also informed that they have the right to withdraw from participating in the study at any time when they wished without providing a reason for the withdrawal and with the researcher imposing no punishment on them.

- **Confidentiality**

The researcher ensured that the principle of confidentiality is maintained by protecting the participant's identity. Participants were informed that confidentiality of the collected data and the respondents would be maintained as no names would be mentioned during and after the study. Respondents are not linked to their responses nor are the construction sites' names mentioned. Participants were informed that their responses would not be revealed to any person other than the researcher, and in case of a scholarly publication, no names would be mentioned. Collected data are to be kept in the locked cabinet for five years and can be destroyed by the researcher after five years.

- **Beneficence**

The principle of beneficence advises the researchers to avoid physical, social and emotional harm to the participants. In fact, the researcher is advised to minimise risks and maximise benefits for the participants. As a result, the participants were assured that the researcher that there would be no physical or psychological harm arising from this study. The researcher used a study design which allows the respondents to answer questions without other participants listening. The researcher also avoided focus group discussion to avoid problems that participants may get from the site managers over certain responses in case other participants divulged their responses. Data was collected in a closed office that only had the participants and the researcher to minimise discomfort in during the making of responses. The researcher ensured that data collection was taken at the agreed time to minimise interruptions.

- **Justice**

The principle of justice ensures that research subjects enjoy the right to fair treatment and the data they provided for the study remains completely private. The researcher ensured justice during the study by offering the study population equal chances of selection to participate in the study by using census sampling methods for participants and including all 13 construction sites in the study.

4.4.4.2 Protecting the rights of the institution

The ethical clearance approval to conduct the study was obtained from the Department of Health Studies Research Ethics Committee at the University of South Africa (UNISA) prior to conducting the study. The researcher adhered to UNISA's ethical code of conduct and high professionalism during the conduct of the study. Permissions to conduct the study were obtained from the Ministry of Labour and Social Welfare of Namibia (currently known Ministry of Labour, Industrial relations and Employment creation) and the Ministry of Health and Social Services in Namibia.

Furthermore, permission to conduct the study was obtained from the Khomas Regional Council since the study was conducted in Windhoek, which lies in the Khomas region.

4.5 CONCLUSION

This chapter described the research design and methodology used in the study. The researcher noted that she used a quantitative, cross-sectional, descriptive, contextual study design to gather information regarding OHS in the construction industries in Windhoek, Namibia. Different data collection tools used to execute the study was explained. The chapter also described the sampling methods, data collection tools, data collection procedure and data analysis methods used in this study. Finally, it described the method used for data analysis, and the study's ethical aspects, reliability and validity.

The next chapter presents and analyses the research findings.

CHAPTER 5

DATA ANALYSIS AND PRESENTATION OF RESEARCH FINDINGS

5.1 INTRODUCTION

This chapter presents results from the analysis of data pertaining to the occupational health and safety (OHS) status in the construction industry of Windhoek, Namibia. The findings are presented as frequencies and percentages in various tables and graphs. The chapter also outlines the findings from site inspections, questionnaires and from the review of documents pertaining to occupational accidents and injuries in the construction industry of Windhoek, Namibia. The socio-demographic characteristic of participants and the identified hazards; participant's awareness on OHS; the extent of the occupational accidents and injuries in the construction industry of Windhoek, Namibia; and findings regarding the employer's legal compliance towards the provision of OHS in the construction industry of Windhoek, Namibia are considered in the chapter too. Photographs taken during site inspections after participants consented for photographs to be taken are also presented to support the study findings.

5.2 DATA MANAGEMENT AND ANALYSIS

5.2.1 Data collection method

The three data collection tools used in this study, and from which the results emanated are:(i) the construction site inspection checklist, (ii) the questionnaire for construction workers, and (iii) the document review checklist used to review records of occupational injuries and diseases reported by construction industries during the period April 2011 to March 2016.

The study was conducted at all 13 construction sites operational in Windhoek during data collection time. Data collected using the questionnaire were gathered from all 13 construction sites, while data collected through the site inspection checklist and document review checklist sections one and two were collected at ten construction sites where the site managers had consented to have the research carried out. Three construction site managers did not agree for site inspection and document review in their respective construction sites. Data from section one and two of the document review checklist were collected from notification forms and accidents, and injury registers obtained from the Ministry of labour, Industrial relations and Employment creation.

All 1097 (n=1097) construction workers from 13 construction sites were included in the sample and data was collected with the interviewer-led questionnaires. However, only 549 construction workers agreed to be interviewed while 548 declined to participate in the study. Furthermore, available documents regarding reported occupational accidents and injuries from the Windhoek construction industry, for the period of five years, from April 2011 to March 2016, were reviewed to assess for the type and magnitude of occupational accidents and injuries in the construction industries of Windhoek, Namibia.

5.2.2 Data analysis approach

Data were coded and entered into the Statistical Package for the Social Sciences (SPSS) Window version 23 computer assisted data analysis software. A descriptive statistical analysis was used to calculate the percentages and frequencies of occupational hazards, accidents and injuries among workers in the construction industry of Windhoek, Namibia. Furthermore, a calculation of the frequencies and percentages based on the data about the construction sites' compliance with OHS legislation and construction workers' OHS aspects awareness was done. Data analysis was carried out with the assistance of the professional statistician.

5.3 RESULTS FROM DATA OBTAINED THROUGH THE SITE INSPECTION CHECKLIST

A total of 13 construction sites were approached for the study and 10 sites participated in the study for site inspection. This translates into a response rate of 76.9%. Thus, site inspections were conducted only at 10 construction sites in order to gather data regarding employers' compliance with the OHS legislative framework and to supplement data collected using questionnaires and the document review checklist. The researcher collected OHS data such as construction workers 'OHS practices, OHS hazards and OHS provisions at the construction sites (see Annexure H).

5.3.1 Occupational health and safety practices at construction sites

This sub-section focuses on the findings regarding occupational health and safety practices such as the construction site workers' utilisation of Personal Protective Equipment (PPE). The aim was to observe the working practices of workers towards OHS compliances and the findings are explained below.

5.3.1.1 Use of personal protective equipment on construction *sites*

The researcher observed, during inspection surveys conducted at the sampled 10 construction sites, whether workers were using PPE while performing their duties. The analysis shows that workers at 5 (50%) of the construction sites were using PPE such as blue overalls, face masks and safety boots, while those at the other 5 (50%) sites did not use any form of PPE, as shown in figures 5.1 and 5.2. Furthermore, 5 (50%) of construction sites were observed to have workers with PPE that was in good condition and not worn out, while PPE at the other 5 (50% sites) were observed to be worn out. Surprisingly, only 30% of the construction sites had a list of workers who had been trained on PPE use, with 70% of the site did not have the list of workers trained on PPE use. Figure 5.1 depicts construction workers wearing some of PPE but not using full PPE, as several workers are not wearing safety helmet. The workers are also working on height and yet they are not using safety harness and there are no guardrails, which put them at risk as they can fall from above. In addition, figure 5.2 shows the construction worker without wearing PPE.

Figure 5.1 Picture taken from construction sites depicting workers not wearing full PPE

Figure 5.2 Picture taken from a construction site depicting a worker not wearing any form of PPE

5.3.2 Nature of occupational hazards in the Namibian construction industry

Inspection surveys were conducted in the construction industry to investigate common occupational hazards prevalent at study sites. The analysis shows that various types of hazards were prevalent at the study sites and these include physical, chemical and ergonomic hazards, as described below.

5.3.2.1 Physical hazards

The researcher assessed for the presence of physical hazards at the studied construction sites. All physical hazards, such as noise, dust, vibration and non-ionized radiation, were found at all 10 (100%) construction sites. Examples of the observed physical hazards include whole-body vibration and dust resulting from the use of heavy machinery not using complete PPE, as shown in figure 5.3.

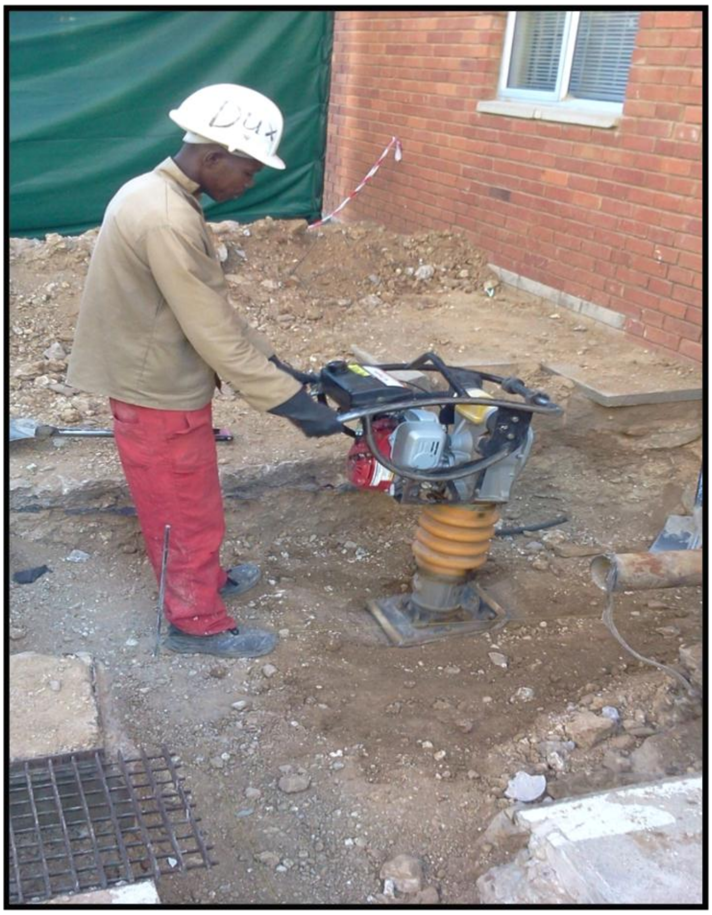


Figure 5.3 Picture depicting a construction worker using a jack hammer at a construction site

5.3.2.2 Chemical hazards

An analysis of the inspection conducted to assess the presence of chemical hazards at the construction sites shows that all 10 (100%) construction sites had chemical hazards such as gases, fumes, mists and aerosol. The workers at all 10 inspected construction sites were observed conducting activities which expose them to chemical hazards. These activities include:

- Welding which produces welding fumes and gases such as carbon monoxide.
- Arc welding that produces welding fumes.
- Spray painting where the paint changes into a mist thus become highly volatile and toxic.

5.3.2.3 Ergonomic hazards

The analysis shows that ergonomic hazards were identified at all 10 (100%) construction sites as workers were observed lifting heavy loads, performing repetitive movements, bending and twisting and working in awkward postures as shown in the pictures below. The pictures in figure 5.4, 5.5, 5.6 and 5.7 were taken at some construction sites in order to validate the findings regarding ergonomic hazards observed during the site inspection.

5.3.2.3.1 Repetitive movement

Figure 5.4 shows a construction worker plastering a wall. The job requires a repetitive movement and awkward posture for him to work with hands above the shoulder level for an extended period and excessive reaching to plaster the wall above the head height. In addition, the plastering work requires the worker to perform repetitive movement of bending to get the plaster from the trolley, putting it on the hawk, and spreading the plaster on the wall using the float. The plastering activity involves repetitive movement of the arm, shoulder, neck and waist.

Figure 5.4 Picture depicting of a construction worker performing repetitive movements

5.3.2.3.2 Working in an awkward posture

The photograph in figure 5.5, showing a worker using a core drilling machine to make a hole in the wall, depicts an image of a worker who spends an extended period in an awkward posture. It can be noted that the worker is performing work on a very low surface which requires him to kneel or squat. The awkward posture strains the worker's knees, lower back and the neck.

Figure 5.5 Picture depicting a worker exposed to vibration whiles adopting an awkward posture at the study site

5.3.2.3.3 Lifting and carrying heavy load at construction sites

Depicted in figure 5.6 is a worker carrying a heavy load resulting in strains over the neck and left shoulder. Material handling and frequent lifting of objects strains the shoulder and arms. The picture shows a worker with both hands holding the load to secure it, which causes both arms to be above the shoulder level.

Figure 5.6 A photograph showing a construction worker lifting heavy loads

5.3.2.3.4 Bending and twisting in the construction industry

Bending and twisting is one of the ergonomic hazards observed at the construction sites during the site inspection. Figure 5.7 portrays the photograph of bricklayers laying bricks in the bending positions. Bending for a longer period could lead to back pain.

Figure 5.7 A photograph showing construction workers performing work in bending positions

5.3.2.4 Hazard identification and control in construction sites

During the site inspections, the researcher assessed the construction sites regarding legal compliance with hazard identification and control. The researcher used the checklist to tick “yes” if the aspect under consideration is present and “no” if not available on the construction site.

As presented in table 5.1, the analysis shows that hazardous operations were identified at 4 (40%) construction sites as compared to 6 (60%) construction sites where nonhazardous operations were identified. In addition, the analysis shows that safety checks were carried out before work commences at 4 (40%) construction sites unlike at the remaining 6 (60%) where it was found out that safety checks were not done before work commence.

However, as evidenced in table 5.1, there was no survey conducted to determine the noise level at all 10 (100%) construction sites. Furthermore, the analysis indicates that the researcher did not find any safety measures that were meant to control vibration at all

10 (100%) inspected construction sites. Finally, the analysis also shows that 6 (60%) construction sites had no waste management policy, unlike the other 4 (40%) that had waste management policies.

Table 5.1 Status of OHS legal compliance on hazard identification and control on construction sites (n=10)

Elements		Response category	Frequencies (n)	Percentages%
1	Are hazardous operations identified?	Yes	4	40
		No	6	60
2	Are safety checks carried out before work commences?	Yes	4	40
		No	6	60
3	Is there a system in place to manage the hazards and risks?	Yes	5	50
		No	5	50
4.	Is survey conducted to determine the noise levels on the construction site?	Yes	0	0
		No	10	100
5	Is there any safety measure in place to control vibration?	Yes	0	0
		No	10	100
6	Are there details of how incidents shall be notified?	Yes	5	50
		No	5	50
7	Are there measures in place to prevent the generation of dust on the site?	Yes	5	50
		No	5	50
8	Is there a waste management policy for the prevention of environmental pollution?	Yes	6	60
		No	4	40

5.3.3 Occupational health and safety provision in the construction industry

Construction sites were inspected in order to determine their provision and promotion of occupational health and safety systems aimed at achieving compliance with the OHS legal framework. The assessment covers OHS management implementation, provision of welfare facilities, electric safety, work equipment safety, emergency preparedness, first aid services provision and the provision of fire safety services.

5.3.3.1 Occupational health and safety management system

The researcher observed the construction sites for OHS legislative compliance. As shown in table 5.2, the analysis shows that 4 (40%) of the construction sites had OHS officers and OHS committees, while 6 (60%) of the construction sites had neither OHS officers nor OHS committees. In addition, 7 (70%) of the construction sites had been inspected by government labour officers during the period after the initiation of recent projects in contrast to 3 (30%) that had not been inspected. As depicted in figure 5.8 the construction site is not demarcated so that people and transport movements can be controlled which pose accidents risk such as being struck by moving vehicle or being struck by machinery among others. It was also found out that 7 (70%) of the construction sites had safety signs displayed on sites as shown in figure 5.9, with 3 (30%) having no safety signs displayed.

Table 5.2 Occupational health and safety management system (n=10)

Elements		Response category	Frequency (n)	Percentage%
1	Is there any Safety Officer on the construction site?	Yes	4	40
		No	6	60
2	Is there a Health and Safety Committee?	Yes	4	40
		No	6	60
3	Has a labour inspector visited the site since the commencement of the project?	Yes	7	70
		No	3	30
4	Is there a people and transport movement control system on site?	Yes	9	90
		No	1	10
5	Are safety signs displayed on the construction site?	Yes	7	70
		No	3	30

Figure 5.8 Construction site showing a lack of people or transport movement control measures

Figure 5.9 A safety information sign on a construction site is depicted in the photograph

5.3.3.2 Provision of welfare facilities at construction sites

The analysis of data regarding the provision of welfare facilities shows that only 3 (30%) of the construction sites had adequate toilet facilities for males and females, while 7 (70%) construction sites did not have adequate toilet facilities designated for male and females as shown in table 5.3. Nevertheless, all 10 (100%) inspected construction sites had drinking water that is separate from the toilet available. A summary of the results regarding welfare facilities provision is shown in table 5.3 below.

Table 5.3 Welfare facilities provision in the construction sites (n=10)

Elements	Response category	Frequency (n)	Percentage (%)
1 Are toilets adequate for male and female as per Regulation 156 (1997) and depending on the number of workers?	Yes	3	30
	No	7	70
2 Are change rooms available?	Yes	4	40
	No	6	60
3 Are the restrooms available?	Yes	0	0
	No	10	100
4 Is there any smoking designated area?	Yes	0	0
	No	10	100
5 Is drinking water available separate from the toilet?	Yes	10	100
	No	0	0

5.3.3.3 Electric safety at construction sites

Construction sites were inspected for the provision of electric safety at work and the results from the analysis are presented in table 5.4. The analysis shows that 6 (60%) construction sites had notices prohibiting unauthorised persons from handling or interfering with electric apparatuses, while 4 (40%) had no such notices. However, all construction sites, 10 (100%) had electrical conductors that were protected through insulation.

As shown in table 5.4, 6 (60%) of the construction sites had instruction on emergency isolation switch and supply cutting, unlike the 4 (40%) construction sites that were observed as not in possession of an emergency isolation switch and supply cutting. However, no portable electrical equipment were safely checked nor labelled for the next inspection at all 10 (100%) construction sites.

Table 5.4 Electric safety at the construction sites (n=10)

Elements		Response category	Frequency (n)	Percentage (%)
1	Is there any notice prohibiting unauthorised persons from handling or interfering with an electric apparatus?	Yes	8	80
		No	2	20
2	Are plugs, sockets, extension cords and electrical equipment defect or damaged?	Yes	1	10
		No	9	90
3	Are electrical conductors protected through insulation?	Yes	10	100
		No	0	0
4	Is the switchboard closed or locked?	Yes	8	80
		No	2	20
5	Is there any instruction on emergency isolation switch and supply cutting?	Yes	6	60
		No	4	40
6	Are there any electrical wires lying in water?	Yes	0	0
		No	10	100
7	Are portable electrical equipment safely checked and labels for the next inspection attached?	Yes	0	0
		No	10	100
8	Are electrical cables clear from walkways?	Yes	5	50
		No	5	50

5.3.3.4 Work equipment safety at construction sites

Construction sites where inspected to determine the aspect of work equipment safety based on OHS compliance. As depicted in figure 5.10, the analysis shows that 9 (90%) of the construction sites had ladders that were in good condition and not damaged, while 1 (10%) had damaged ones. Moreover, 6 (60%) of the construction sites had their machines guarded as opposed to 4 (40%) sites that machinery which was left unguarded. However, only 2 (20%) of the construction sites had inspection records for work equipment kept on site, with the majority 8 (80%) construction sites having no work equipment inspection records on their sites.

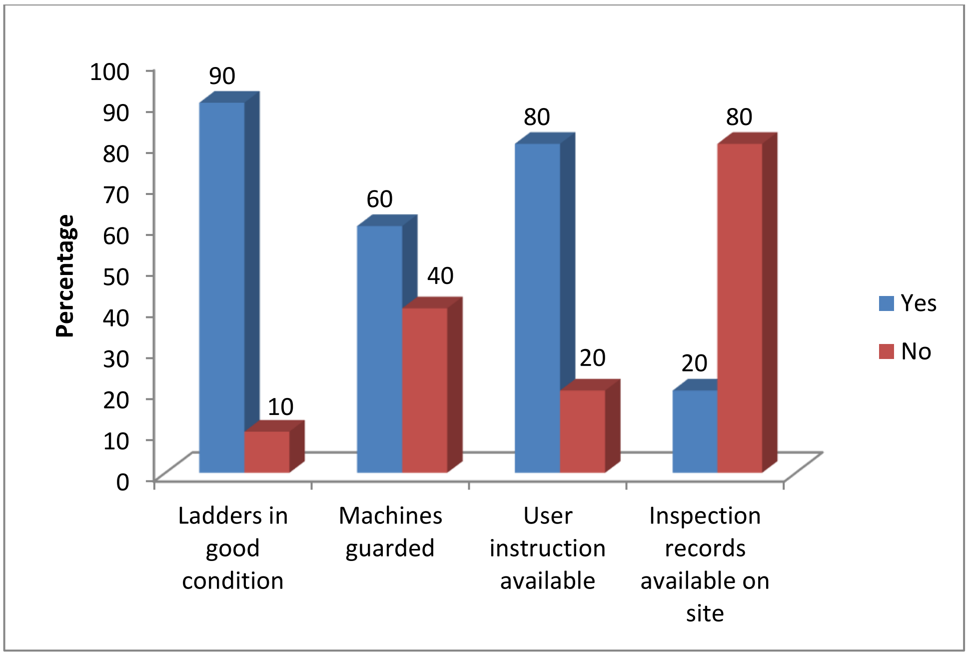


Figure 5.10 Construction sites work equipment safety (n =10)

5.3.3.5 Emergency preparedness at construction sites

The analysis, as indicated in table 5.5, shows that 6 (60%) of the construction sites had emergency plans, a list of contacts such as the ambulance, fire and police in case of emergency, and had arrangements in place with the hospital or ambulances in case of emergency referral, contrary to the conditions existing at 4 (40%) construction sites. Furthermore, the analysis shows that all 10 (100%) construction sites had no safety box minutes.

Table 5.5 Emergency preparedness in construction sites (n=10)

Elements	Response category	Frequencies (n)	Percentage (%)
1 Does the construction site have an emergency plan in place?	Yes	6	60
	No	4	40
2 Is the list of emergency telephone Numbers of the police, ambulance, fire stations displayed on the site?	Yes	6	60
	No	4	40
3 Are safety box minute present?	Yes	0	0
	No	10	100
4 Is the register for emergency equipment available?	Yes	6	60
	No	4	40

5.3.3.6 Provision of first aid services at the construction sites

Information about compliance regarding the provision of first aid services at the construction sites is depicted in figure 5.11. Notably, 8 (80%) of the construction sites had first aid stations, while 2 (20%) did not have any first aid stations. Furthermore, 9 (90%) of the construction sites had first aid kits with 1 (10%) site having none. However, certified first aiders and first aid manuals were only available at 1 (10%) of the construction sites leaving the other 9 (90%) construction sites without certified first aiders or first aid manuals. Finally, only 2 (20%) construction sites had first aid registers kept on the sites unlike the 8 (80%) construction sites that had none.

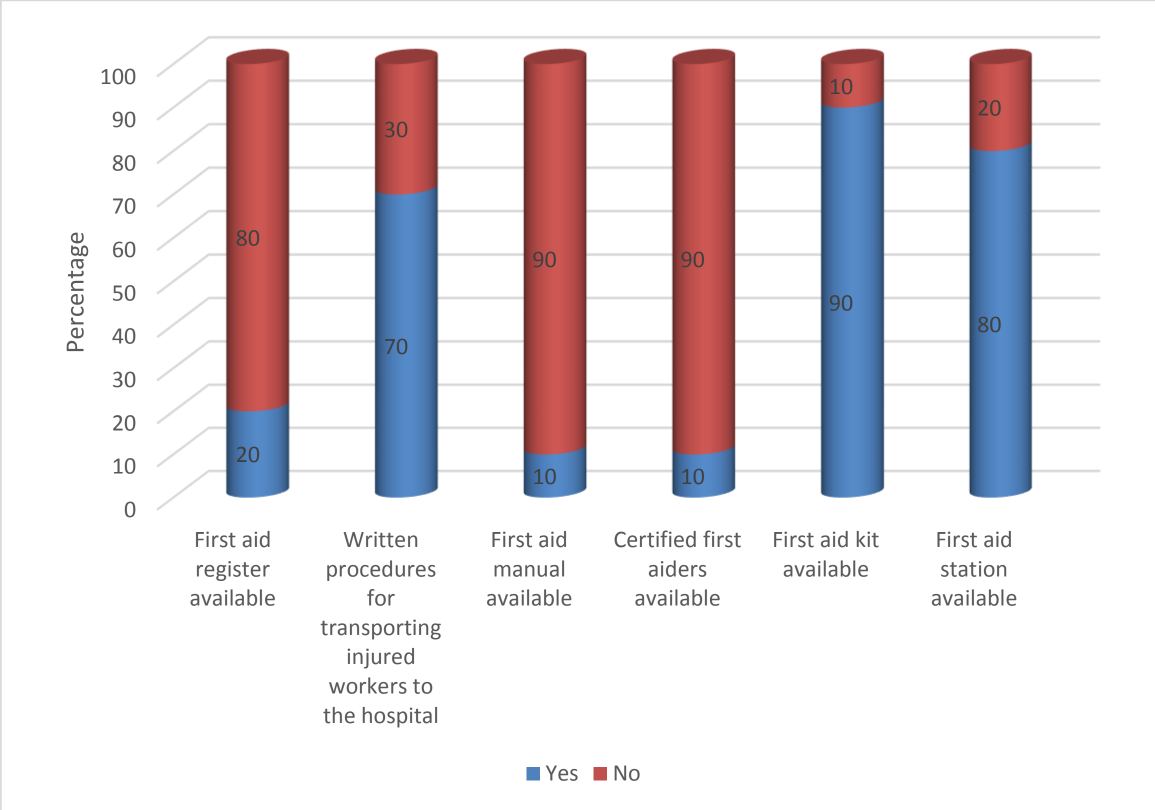
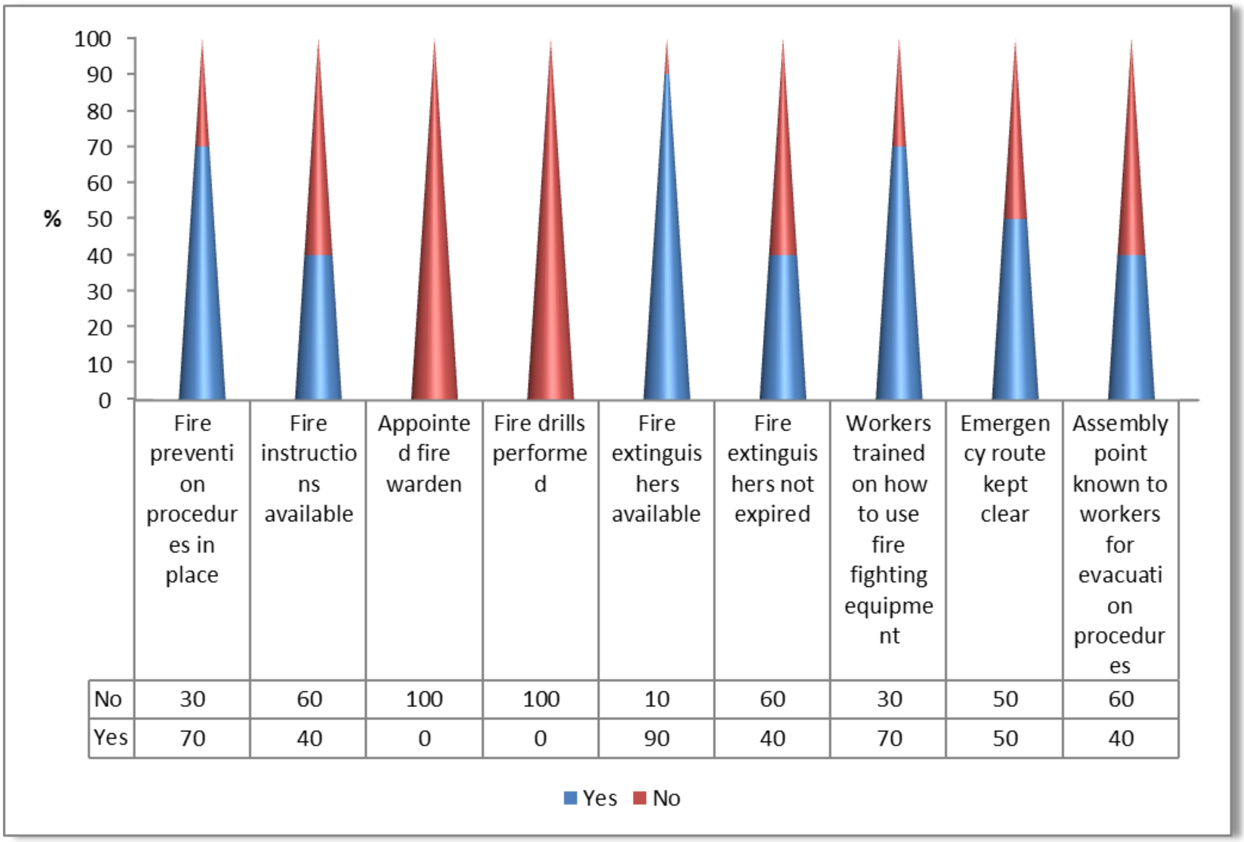


Figure 5.11 Provision of first aid services at construction sites (n=10)

5.3.3.7 Availability of fire safety systems and procedures at construction sites

An analysis of data regard to the provision of fire safety services at the construction sites shows that 7 (70%) of the construction sites had fire prevention procedures in place while 3 (30%) sites had no fire prevention procedures. Furthermore, 4 (40%) of the construction sites had fire instructions informing the workers about what to do in case of a fire outbreak posted in an open and public space, unlike the other 6 (60%) construction sites that had no fire instructions displays. However, the analysis shows that all 10 (100%) construction sites had no appointed fire warden to coordinate fire activities nor were fire drills performed or recorded to make the workers aware of what is required in case of a fire.

Though the analysis shows that 9 (90%) of the construction sites had fire extinguishers readily available, 1 (10%) construction site had no fire extinguishers. It was also noted that fire extinguishers at 6 (60%)of the construction sites had expired, while the other 4 (40%) sites had fire extinguishers that had not expired, as depicted in figure 5.12. Workers at 7 (70%) construction sites had been trained on the usage of fire extinguishers unlike those at 3 (30%) sites who had not been trained at all.



	Fire prevention procedures in place	Fire instructions available	Appointed fire warden	Fire drills performed	Fire extinguishers available	Fire extinguishers not expired	Workers trained on how to use fire fighting equipment	Emergency route kept clear	Assembly point known to workers for evacuation procedures
No	30	60	100	100	10	60	30	50	60
Yes	70	40	0	0	90	40	70	50	40

Figure 5.12 Fire safety systems and procedure sat the construction sites (n=10)

5.4 RESULTS FROM PARTICIPANTS'QUESTIONNAIRES

The results discussed in this section emanated from an analysis of the data collected through interviewer-led questionnaires conducted among workers at all 13 construction sites. The collected data focused on the socio-demographic characteristics of participants, participants' awareness of OHS existence at construction sites, occupational hazards, occupational accidents, work-related health problems, OHS provision and corporal social responsibility of the construction sites. The participants' suggestions on how to improve OHS in the construction industry is also presented in this chapter. A total of 549 workers out of the 1097 workers available at study sites participated in the study giving a response rate of 50%.

5.4.1 Participants' socio-demographic characteristics

The analysis, as indicated in table 5.6, shows that 485 (88.3%) of the participants in this study were males and 64 (11.7%) were females. The participants' age group distribution consists of 235 (42.8%) participants aged between 18 and 29 years followed by 229

(41.7%) occupying the 30-39 age range. The mean overall age is 31.48 years. Furthermore, of these workers, 364 (66.2%) were single, while 37 (25%) were married.

The participants' educational background and their respective occupations, were also analysed. The findings show that 275 (50.1%) participants had secondary education, while 210 (38.3%) participants had attained a primary level education qualification. The analysis shows further the participants 'occupations as follows: 124 (22.6%) bricklayers, 123 (22.4%) labourers, 70 (12.8%) carpenters, 66 (12%) painters, 62 (11.3%) plumbers, 53 (9.7%) other category of construction workers, 29 (5.3%) electricians, 15 (2.7%) drivers, and 7 (1.2%) were engineers. Finally, the analysis also shows that 400 (72.9%) of the participants were permanent workers, 83 (15.1%) were employed on fixed contract, while 66 (12%) were casual workers.

Table5.6 Participants' socio-demographic characteristics (N=549)

Characteristic of participants	**Frequencies (n)**	**Percentage (%)**
Gender		
Male	485	88.3
Female	64	11.7
Age groups of workers in years		
18-29	235	42.8
30-39 years	229	41.7
40-49 years	83	15.1
50-59 years	2	0.4
Marital status		
Single	364	66.2
Married	137	25
Divorced	14	2.6
Widowed	4	0.7
Separated	8	1.5
Cohabiting	22	4
Education level		
None	32	5.8
Primary	210	38.3
Secondary	275	50.1
Tertiary	35	5.8

Characteristic of participants	Frequencies (n)	Percentage (%)
Occupation status		
Bricklayer	124	22.6
Painter	66	12
Electrician	29	5.3
Plumber	62	11.3
Engineer	7	1.2
Carpenter	70	12.8
Labourer	123	22.4
Driver	15	2.7
Other	53	9.7
Employment type		
Permanent	400	72.9
Fixed	83	15.1
Casual	66	12

5.4.2 Participants’ awareness of the occupational health and safety aspects at construction sites

5.4.2.1 Participants’ awareness of OHS policy availability and accessibility

The analysis of data about the participants’ awareness of the availability of OHS policy at their respective construction sites shows that 164 (29.9%) reported that they were aware of the availability of OHS policies as compared to 385 (70.1%) who reported the opposite. In addition, 407 (74.1%) of the participants indicated that they had access to the OHS policy on their construction sites, as shown in figure 5.13.

Figure 5.13 also shows that 334 (60.8%) of the participants stated that they did not receive any OHS training, while another 115 (39.2%) participants had received OHS training. Participants were also asked to indicate whether they were aware of the health and safety representatives at their work places. The analysis of responses regarding the awareness and presence of health and safety representatives shows that 212 (38.68%) of the participants were aware of their representatives’ availability, contrary to 337 (61.42%) of the participants who were not aware of the OHS representatives at their respective construction sites.

The responses regarding an awareness of the availability of the occupational health and safety officers and issues related attendance of safety workshops and measures expected in case of a disaster or accident were analysed. The analysis shows that 216 (39.3%) participants were aware of the available OHS officers at their workplaces, while 333 (60.7%) indicated that they were not aware of any OHS officers at their construction sites. The analysis of responses to the aspect of attendance of safety talks in the construction sites shows that 260 (47.2%) of the participants have attended safety talks at their construction sites unlike the 289 (52.8%) who pointed out that they had not attended safety talks. Moreover, 337 (61.4%) of participants were aware of what to do when accidents happen at work, while 212 (38.6%) pointed out that they were not aware of what to do in the case of a workplace accident.

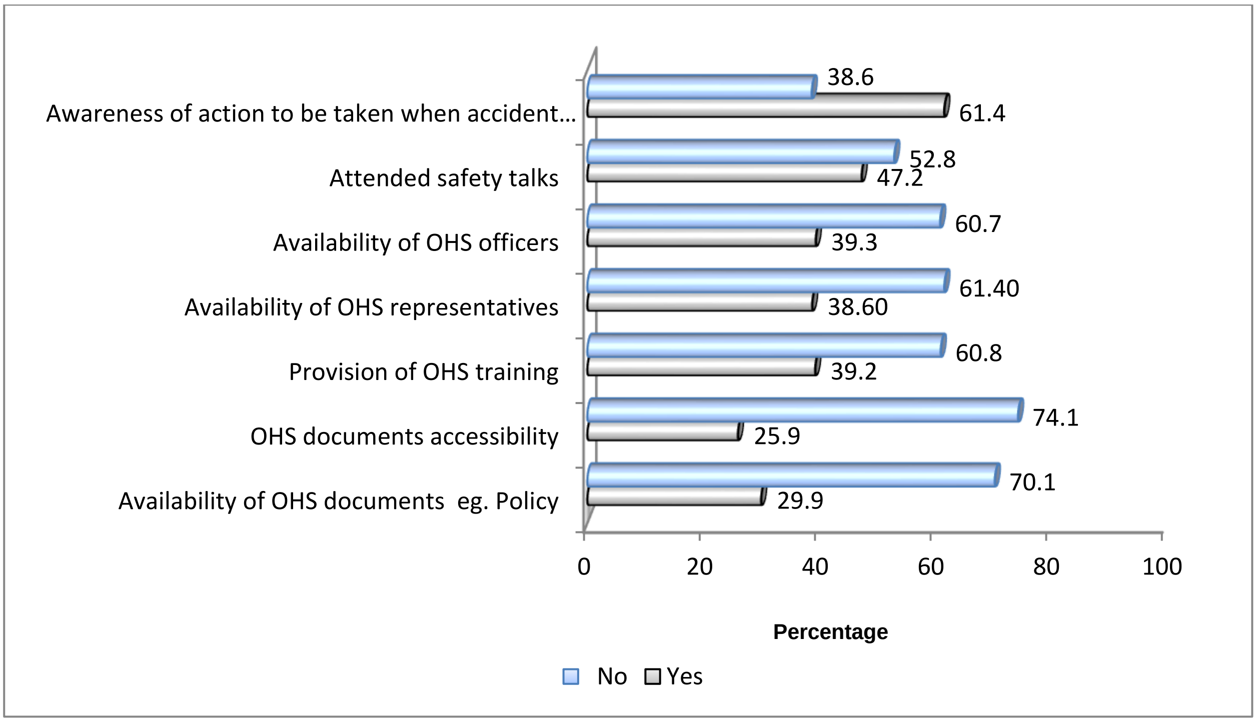


Figure 5.13 Participants' OHS awareness (N=549)

5.4.2.2 Participant's awareness of emergency preparedness procedures and provision of first aid services at construction sites

Figure 5.14 reflects the participant's awareness of emergency preparedness and first aid services provision on the construction sites. Participants were asked to state whether they were aware of any emergency plan at their respective construction sites. The analysis shows that 469 (85.4%) of the participants indicated that they were not aware on the existence of an emergency plan at their workplaces, while 80 (14.6%) pointed out that they were aware of such a plan. Regarding the attendance of emergency training at work, the analysis illustrates that 465 (84.7%) of the participants had never attended emergencies training at work as opposed to 4 (15.3%)participants that had attended workplace emergency training sessions. In addition, a lesser number of 273 (49.7%) participants were aware of the availability of first aiders at their construction sites, unlike the slight majority of 276 (50.3%) participants who were not aware of first aiders at their workplace. Finally, the analysis shows that 296 (53.9%) of the participants were aware of the location of the first aid kit unlike the 253 (46.1%) participants who stated their unawareness of the location of the first aid kits.

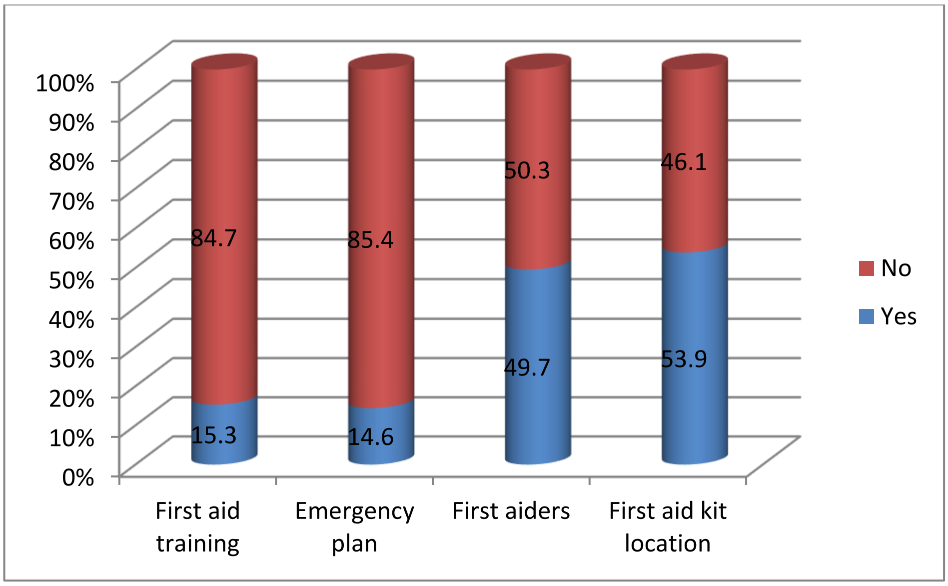


Figure 5.14 Participants' awareness of emergency preparedness procedures and provision of first aid at construction sites (N=549)

5.4.2.3 Participant's awareness of reporting on and control of occupational hazards

Participants were asked to indicate whether they were aware of where to report identified occupational hazards. The analysis shows that 303 (55.2%) of the participants knew where to report occupational hazards as compared to 246 (44.8%) who did not know where to report identified occupational hazards. The responses to the question whether participants were aware of workplace performance of hazard control reveal that 216 (39.3%) of the participants were aware that hazard control was being performed at workplaces, while, 328 (59.7%) of the participants indicated that hazards controls were not performed at the respective construction sites as illustrated in figure 5.15.

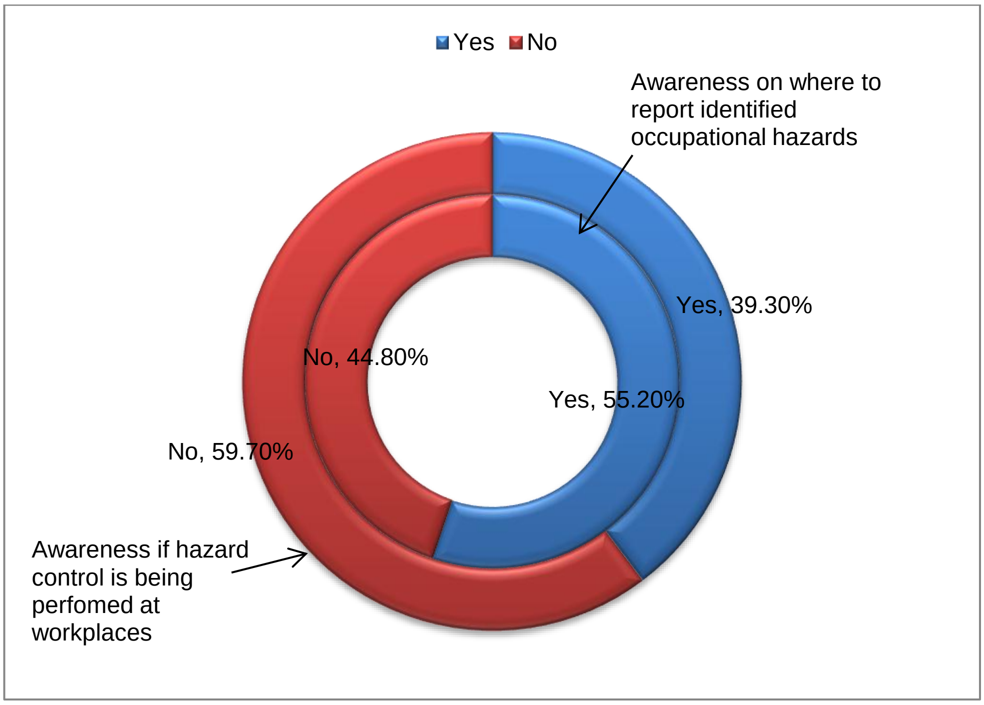


Figure 5.15 Participant's awareness of reporting on and control of occupational hazards

5.4.3 Occupational health and safety hazards in the construction industry

Participants were asked to indicate the nature of hazards that they were exposed to on the study sites. They reported exposures to physical, chemical and psychosocial hazards existing on their construction sites and the details are provided hereunder:

5.4.3.1 Nature of physical and chemical hazards at construction sites

Participants were asked if physical hazards were present on the construction sites and the findings are illustrated in figure 5.16. The analysis shows that 521 (94.9%) of the participants indicated the presence of noise on their construction sites, while 28 (5.1%) disagreed as they stated that there was no noise at their construction sites. In addition, the analysis reveals that dust posed as a physical hazard at the construction sites as stated by 519 (94.2%)of the participants and in contradiction to 30 (5.8%) who did not think that dust was a physical hazard. Furthermore, the analysis shows that, 508 (92.5%) of the participants indicated vibration as one of the types of physical hazards present at their construction sites, while 41 (7.5%) of the participants stated that vibration was not present at the construction site. Lastly, the analysis shows that 517 (94.2%) of the participants indicated that chemical hazards, such as paints, were present at the construction sites unlike the 32 (5.8%)participants who stated that there were no chemical hazards at their sites.

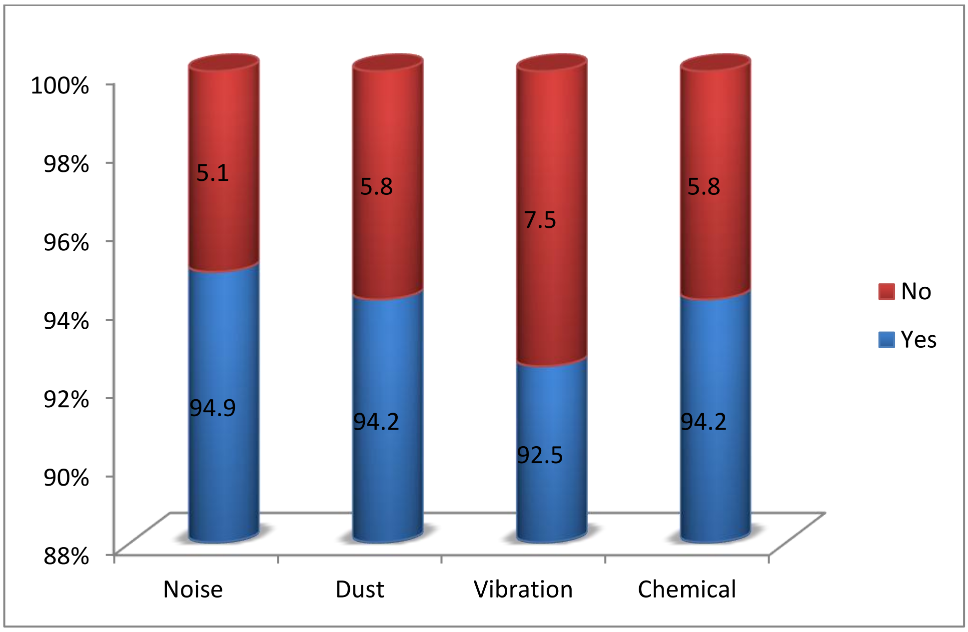


Figure 5.16 Nature of physical and chemical hazards at the construction sites (N=549)

5.4.3.2 Nature of psychosocial hazards at construction sites

Participants were asked to indicate whether psychosocial hazards, such as discrimination and victimisation had ever happened on the construction sites. The analysis reveals that, 56 (10.2%) of the participants indicated that discrimination had happened at their worksites opposing 493 (89.8%) participants. Furthermore, the analysis shows that only 47 (8.6%) of the participants indicated that victimisation had ever happened on the construction sites, while 502 (91.4%) stated they had not experienced any victimisation at their construction sites.

5.4.4 Nature of occupational accidents at construction sites

As shown in figure 5.17, the analysis shows the participants' responses on the occurrence of certain occupational accidents at their respective construction sites. The analysis shows that falls from above were reported by 117 (21.3%) of the participants, while 432 (78.7%) pointed out to the contrary that falls had never occurred at the construction sites. The analysis illustrates further that 82 (15%) participants confirmed the occurrence of cut by machinery, while a majority 467 (85%) participants stated that they never occurred. The analysis also shows that 71 (12.9%) of the participants confirmed witnessing incidents of sticking by falling objects at their construction sites, a view that is contradicted by 478 (87.1%) participants who indicated that accidents arising from falling objects never happened at their workplaces.

The analysis of data on the question whether struck-by-moving-objects accidents had transpired at the construction sites indicated that 60 (10.9%) of the participants agreed, while a huge majority of 489 (89.1%) participants disagreed with the minority participants' responses. The analysis also shows that electrocution was reported by 61 (11.1%) of the participants while 488 (88.9%) participants indicated that electrocution never happened at their construction sites.

Participants were also asked about motor vehicle accidents at the construction sites. In this regard, the analysis shows that 49 (8.9%) of the participants had experienced motor vehicle accidents in their respective sites, a statistic that is much lower than the 500 (91.1%) participants who claim that they had never been witnessed. Lastly, participants were asked about the experience of trench burying on the construction sites, and the analysis of the responses demonstrated that 48 (8.7%) of the participants reported that trench burying accidents had ever happened at their construction sites, thus contradicting 501 (91.3%) of the participants who deny that they had witnessed trench burying related accidents at the construction sites.

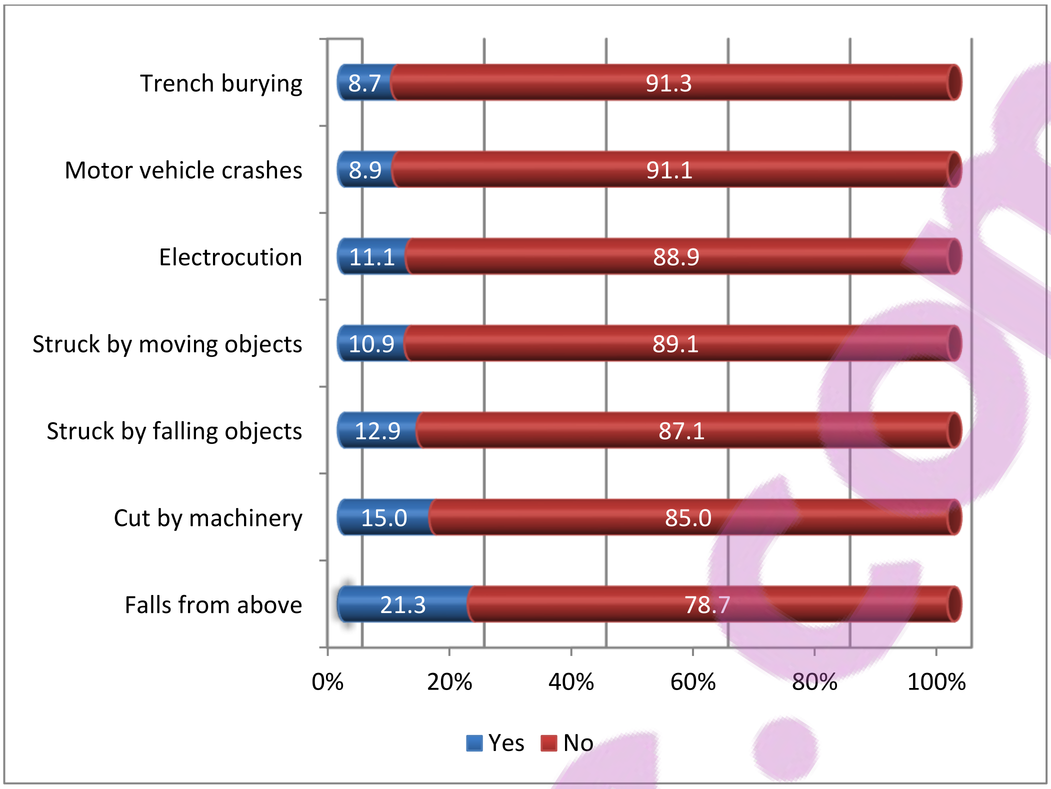


Figure 5.17 Nature of occupational accidents at the construction sites (N=549)

5.4.5 Nature of work-related health problems faced by participants

Participants were asked to indicate whether they had experienced any work-related health problems, such as back pain, skin problems, and difficulties in breathing or hearing complications during the six months prior to the study. The results obtained from an analysis of the participant responses data are illustrated in figure 5.18.

The analysis shows that 68 (58.1%) participants had suffered from back pain, while 481 (41.9%) deny enduring any back pain. The analysis also reveals that a minority 27 (23.1%) participants reported that they had had breathing difficulties, much to the contrary of a huge majority of participants totalling 522 (76.9%) who indicated that they had not encountered any breathing difficulties. The analysis shows further that, 22 (18.8%) of the participants had experienced skin problem while 527 (81.2%) had not. Finally, an analysis of data regarding the occurrence of hearing problems reveals that 9 (7.7%) of the participants had difficulties in hearing while 540 (92.3%) participants stated that they did not experience any hearing challenges.

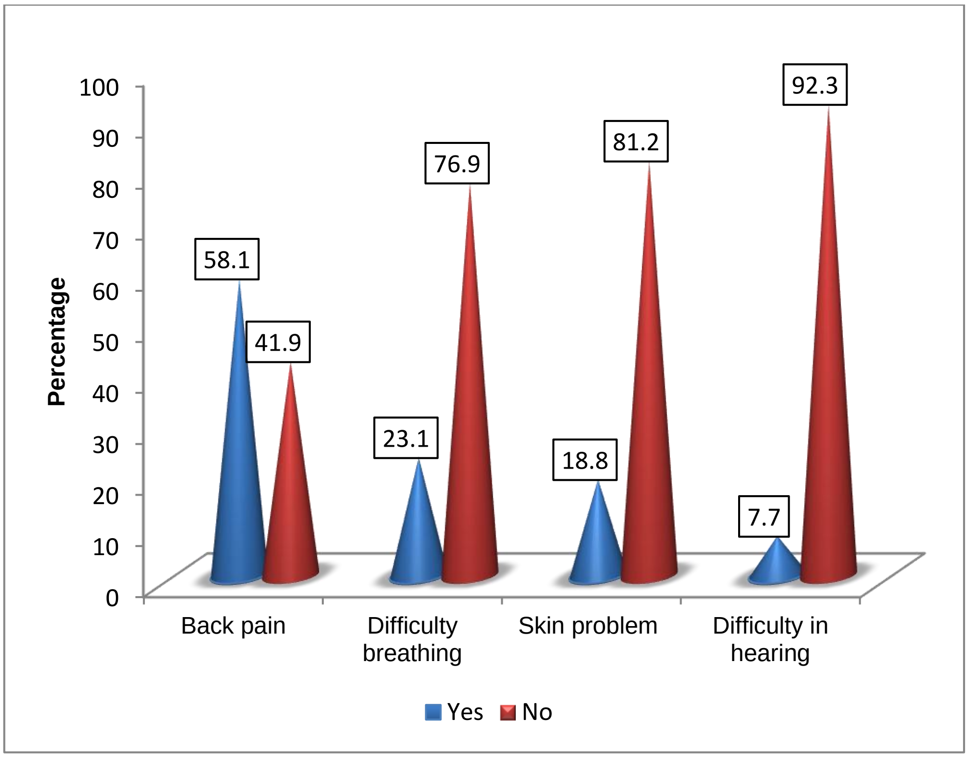


Figure 5.18 Nature or type of work-related health problems reported by participants (N=549)

5.4.6 Provision of Occupational Health and Safety provision at construction sites

Participants were asked questions related to OHS provisions as the researcher sought to assess the construction sites' compliance with OHS provisions. The aspects assessed here include provision of welfare facilities and PPE provision and usage.

5.4.6.1 Provision of welfare facilities at construction sites

Table 5.7depicts a summary of the participants' responses regarding the provision of welfare facilities at different construction sites. Participants were asked to indicate if toilet facilities were provided in the construction sites and an analysis of the responses shows that 532 (96.9%) of the participants confirmed that toilet facilities were provided at the construction sites, while 17 (3.1%) participants disagreeing. Further analysis of the response data shows that 268 (48.8%) of the participants indicated that toilets were demarcated for males and females as per Regulations relating to the health and safety of employees at work (Regulation 156 of 1997), while a majority 281 (51.2%) participants stated that toilets were not demarcated for males and females. However, the analysis shows that 154 (28.1%) of the participants stated that hand washing soaps were available in the toilets as opposed to 392 (71.9%) who denied the availability of hand washing soap in the construction sites' toilets.

On the question whether the participants were getting rest break, the analysis shows that 527 (96.0%) of the participants confirmed that they were getting rest breaks, while a limited 22 (4.0%) participants stated that they were not getting rest breaks. However, the analysis reveals that only 107 (19.5%) participants indicated that rest rooms were available on their respective construction sites, while 442 (80.5%) participants indicated that restrooms were not available at the construction sites. Lastly, the analysis further indicates that 490 (89.3%) of the participants confirmed the non-existence of designated smoking areas at their respective construction sites in contrary, with only 59 (10.7%) participants who indicating that the smoking designated area were available at the construction sites.

Table 5.7 Participants' responses on the provision of welfare facilities at construction sites (N=549)

Variables		Yes	No
1	Toilet access	532 (96.9%)	17 (3.1%)
2	Toilet demarcated for males and females	268 (48.8%)	281 (51.2%)
3	Hand washing soap available in the toilet	154 (28.1%)	392 (71.9%)
4	Provision of rest break to workers	527 (96.0%)	22 (4%)
5	Availability of rest rooms at the construction site	107 (19.5%)	442 (80.5%)
6	Availability of smoking designated areas	59 (10.7%)	490 (89.3%)

5.4.6.2 Provision and usage of personal protective equipment (PPE)

A summary of the analysis of responses related to PPE provision and usage is presented in figure 5.19. On the question whether participants were provided with PPE at work the analysis indicated that 455 (82.9%) of the participants agreed that PPE were provided at work, while a contrary view held by 94 (17.1%) participants stated that PPE was not provided at their workplaces. Furthermore, the analysis demonstrated that 66 (12%) of the participants usually made personal payments to get PPE, while a majority of the participants, 483 (88%) pointed out that PPE were provided free of charge.

The participants were also asked other questions pertaining to PPE usage. They were asked to indicate whether PPE fitted properly. The analysis shows that 457 (83.4%) of the participants indicated that PPE were fitting properly, while 92 (16.6%) of the participants indicated that PPE was not fitting properly. Moreover, the analysis reveals that 452 (82.3%) of the participants felt comfortable while wearing PPE, unlike with 7 (17.7%) of the participants who stated that they felt uncomfortable while wearing PPE. The data gathered from the question about whether participants were given replacements when PPE is worn out was analysed and the results show that 424 (77.2%) of the participants confirmed having been given replacements after their PPE had worn out, a view that is contradicted by 35 (22.8%) of the participants who pointed out that they were not given replacements. Finally, the analysis regarding participants' use of PPE while performing their work indicates that 415 (75.6%) participants stated that they were using PPE during their work against 44 (24.4%) who indicated that they did not wear PPE when working.

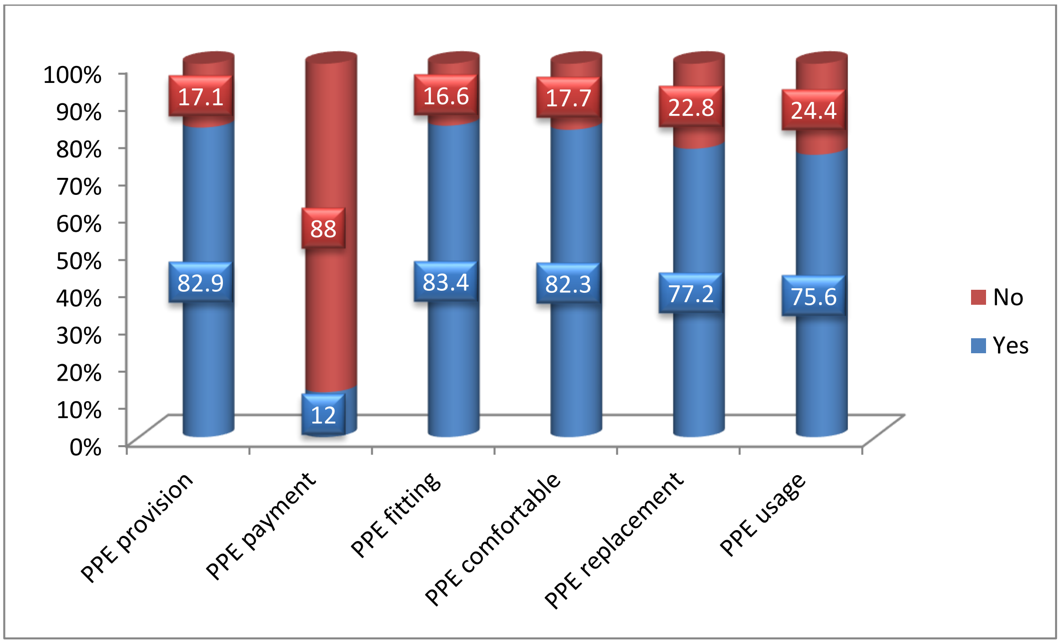


Figure 5.19 Participants' responses on the provision and utilisation of personal protective equipment (N=549)

5.4.7 Demonstration of corporal social responsibility at the construction sites

Participants were asked questions regarding the construction company's corporal social responsibility and the analysis summary is presented in figure 5.20. The analysis shows that 65 (11.8%) of the participants indicated that they received waste disposal training unlike the 484 (88.2%) who indicated that they were not trained in waste management. In addition, the analysis indicates that, 437 (79.6%) of the participants stated that they are provided with the transport to and from work while 112 (20.4%) participants claim that they were not provided with the transport. Furthermore, the analysis further shows that only 23 (4.2%) of the participants indicated that they were provided with the medical aid services with a huge majority of 526 (95.8%)participants indicating that they were not provided with medical aid services.

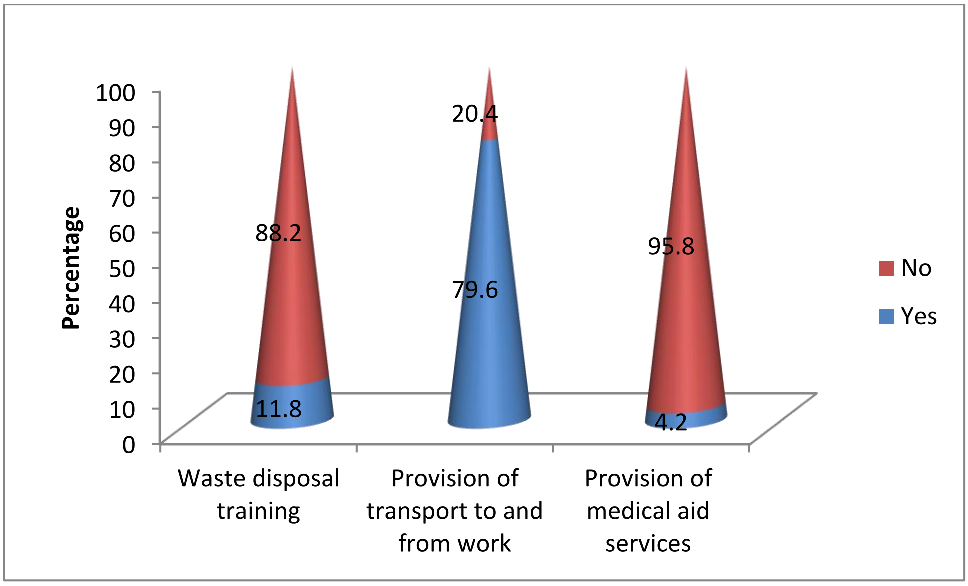


Figure 5.20 Demonstration of corporal social responsibility at the construction sites (n=549)

5.4.8 Participants views regarding the improvement of health and safety in the construction industry

The following section highlights the participants' views emanating from an open-ended question included in the questionnaire, which is: "What could be done to improve OHS in the construction industry?"

The following common elements derived from participants' responses were categorised into themes and sub-themes as described below and illustrated in table 5.8.

- OHS programme implementation
- OHS training of workers
- Provision of medical services to construction workers
- Adequate provision of welfare facilities
- Personal Protective Equipment (PPE) provision

5.4.8.1 Occupational Health and Safety programme implementation

The analysis shows that 168 (29.6%) of the participants indicated that construction companies should implement OHS programmes at construction sites. Further variables are evident among those who shared this sentiment as shown by 19 (3.4%) participants who indicated the need for the establishment of OHS policies, 10 (2.0%) participants underscored the importance of establishing anti-harassment policies, and 31 (5.6%) who stated the importance of recruiting OHS officers for all construction sites. The analysis also shows that, 30 (5.4%) participants noted the importance of having OHS committees which would guide them on OHS aspects at construction sites, while another 32 (5.8%) participants stated that labour inspectors should check construction sites for OHS compliance.

5.4.8.2 Occupational Health and Safety training of workers

The analysis shows that 97 (17.6%) of the participants indicated the importance of conducting OHS training on construction sites. The distribution of the response and type of training is marked by 44 (8%) participants recommending accident prevention training, 12 (2.2%) suggesting electric safety training due to the increase of electric accidents in the construction industry, while, 18 (3.3%) participants pointed out that there is need for the training on accident prevention measures.

5.4.8.3 Provision of medical services to construction workers

The provision of medical services to construction workers was indicated by 92 (16.8%) of the participants. However, within the participants who shared this theme are 25 (4.5%) who indicated the need for the provision of medical aid services, 21 (3.8%) stated that they should have medical check-ups at work, while 11 (2%) of the participants suggested that they should be provided with antiretroviral treatment on construction sites. The analysis shows further that 24 (4.3%) participants would like to have first aid service provision at work, whereas 11 (2.2%) indicated that there is a need for ambulances on site so that they can take workers to the hospital in case of workplace injuries or accidents.

5.4.8.4 Adequate provision of welfare facilities

The analysis indicates that 126 (23%) of the participants need adequate provision of welfare facilities such as separate adequate toilets for males and females as stated by 27 (4.9%) respondents, designated smoking area as indicated by 20 (3.6%), and an end to the long working hours during their Mondays to Saturdays work schedule as stated by 10 (1.8) interview respondents. The analysis also indicates that 47 (8.5%) participants were in favor of company provided transport to and from work, while 22 (4%) pointed out that their wages/salaries should be increased.

5.4.8.5 Personal protective equipment (PPE) provision

Finally, the analysis reveals that 71 (13%) of the participants indicated that PPE provision and replacement would improve the construction industry's OHS. This sentiment was shared by 36 (6.6%) participants who also alluded to the need for the provision of PPE to construction workers, while 35 (6.4%) of the participants pointed out that there is the need for the replacement of PPE.

Table 5.8 Themes and sub-themes for the improvement of the occupational health and safety in the construction industry in Windhoek, Namibia (N=549)

Main issue	Frequencies (n)	%	Sub-themes		Frequencies (n)	Percentage %
OHS programme implement-tation	163	(29.6)	5	OHS policy development	19	(3.4)
			6	Anti-harassment policy development	10	(2)
			7	Recruitment of OHS officers	31	(5.6)
			8	Appointment of OHS representatives	41	(7.4)
			9	Appointment of OHS committees	30	(5.4)
			10	Labour inspector visit	32	(5.8)
OHS training of workers	97	(17.6)	11	Training of workers on accident prevention	44	(8)
			12	Training of workers on what to do in case of an accident	18	(3.3)
			13	Training of workers on emergency care	23	(4.1)
			14	Training of workers on electric safety	12	(2.2)
Provision of medical services to construction workers	92	(16.8)	15	Provision of medical aid services	25	(4.5)
			16	Provision of medical checkup at work	21	(3.8)
			17	Provision of Antiretroviral therapy (ART) at work places	11	(2)

			18 Provision of First aid services	24	(4.3)
			19 Provision of Ambulance services	11	(2.2)
Adequate provision of welfare facilities	126	(23)	20 Provision of adequate toilet facilities	27	(4.9)
			21 Provision of smoking area	20	(3.6)
			22 Prevention of long working hours	10	(1.8)
			23 Provision of transport to and from work	47	(8.5)
			24 Salary increase	22	(4)
Personal protective equipment (PPE) provision	71	(13)	25 PPE Provision	36	(6.6)
			26 PPE replacement when worn out	35	(6.4)
TOTAL		**(100%)**		**549**	**(100%)**

5.5 FINDINGS FROM A REVIEW OF DOCUMENTS ABOUT OCCUPATIONAL ACCIDENTS AND INJURIES AT CONSTRUCTION SITES

OHS-related documents were reviewed to assess the availability of OHS documentation at the construction sites. The documents related to notified occupational accidents and injuries stored by the Ministry of Labour, Industrial relations and Employment creation for the period April 2011 to March 2016 were also reviewed to determine the nature and magnitude of occupational accidents and injuries reported as having occurred at construction sites.

5.5.1 Findings from a review of documents at construction sites

Data regarding personal health resources, hazard identification and control, OHS management provision and OHS induction and training and documents pertaining to psychosocial work environment were gathered from a review of the documents available at all 10 construction sites.

5.5.1.1 Findings on the availability of personal health resources documents

The document review indicates that job descriptions were available for each job categories at 5 (50%) of the construction sites while the other 5 (50%) construction sites had no job descriptions of all job categories. Furthermore, the analysis shows that only 2 (20%) of the construction sites outlined the health and safety responsibilities of construction workers in the job descriptions, unlike the other 8 (80%) that did not. The analysis also shows that only 3 (30%) of the construction sites had minutes for the health and safety committee meetings while 7 (70%) of the construction sites had none as they did not hold any health and safety committee meetings.

Documents pertaining to the filling of pre-employment medical questionnaire by each worker and employment screening reports were also reviewed. The analysis indicates that all 10 (100%) construction sites had no pre-employment medical questionnaire and employment screening reports. Furthermore, only 4 (40%) of the construction sites were found to have names and positions of workers and the specific health and safety responsibilities, thus leaving the other 6 (60%) as non-compliant to this OHS aspect.

Table 5.9 Availability of documents regarding personal health resources in the construction sites (N=10)

Element		Response category	Frequency (n)	Percentage (%)
1	Are job descriptions available for each worker's job categories?	Yes	5	50
		No	5	50
2	Are health and safety responsibilities stated in the workers' job descriptions?	Yes	2	20
		No	8	80
3	Are health and safety committee meeting minutes available?	Yes	3	30
		No	7	70
4	Does the company keep pre-employment medical questionnaires filled by each worker?	Yes	0	0
		No	10	100
		Yes	0	0

Element	Response category	Frequency (n)	Percentage (%)
5 Are pre-employment screening reports available?	No	10	100
6 Are the lists of names and positions of workers with specific health and safety responsibilities available?	Yes	4	40
	No	6	60

5.5.1.2 Findings on the availability of documents regarding hazard identification and control on study sites

The document review also assessed the availability of documents regarding hazard identification and control as depicted in table 5.10.

A number of observations were made regarding hazard identification and control. The analysis shows that 2 (20%) of the construction sites had accident registers while 8 (80%) had none. It is also evident, from the review that, accident investigation procedures existed at 3 (30%) of the construction sites with 7 (70%) sites having no accident investigation procedures. In addition, the analysis reveals that 5 (50% of the construction sites were found to have injury on duty reporting forms and the other 5 (50%) construction sites had no injury on duty reporting forms.

The documentation about workplace inspection was also reviewed. The analysis here shows that workplace inspection was shockingly, carried out at only 2 (20%) construction sites with the remaining 8 (80%) and larger majority of the sites not carrying out an inspection. The analysis also indicated that checklists for workplace inspection were only available at 1 (10%) construction site, thus leaving the majority and 9 (90%) of the construction sites without workplace inspection checklists. Finally, none of the study sites possessed written procedures for action to be taken after workplace inspections.

Table 5.10 Availability of documents regarding hazard identification and control (N=10)

Element	Response category	Frequency (n)	Percentage (%)
1 Is an accident register available at the construction site?	Yes	2	20
	No	8	80
2 Are accident investigation procedures available?	Yes	3	30
	No	7	70
3 Are injuries on duty report forms available?	Yes	5	50
	No	5	50
4 Are incident reporting procedures available?	Yes	3	30
	No	7	70
5 Is there any document indicating that workplace inspection is carried out regularly?	Yes	2	20
	No	8	80
6 Are checklists that are used for workplace inspection available?	Yes	1	10
	No	9	90
7 Are procedures for action after inspection findings available?	Yes	0	0
	No	10	100

5.5.1.3 Findings on the availability of documents pertaining to the provision of occupational health and safety management system at construction sites

As illustrated in table 5.11, an analysis of documents pertaining to the provision of occupational health and safety management system indicates that only4 (40%) of the construction sites had an OHS policy while the other 6 (60%) were without OHS policies. It is also evident that 7 (70%) construction sites had Ministry of Labour, Industrial relations and Employment creation approval letters to commence and carry out construction work, while 3 (30%) had none. The analysis shows further that 5 (50%) of the construction sites had copies of the Labour Act (Act 11 of 2007), while the other 5 (50%) construction sites did not have any copy of the Labour Act (Act 11 of 2007). The other observation made during the analysis here is the non-compliance by all 10 (100%) construction sites towards the possession and display of Regulation No 156 (1997), which seeks to guarantee the health and safety of employees at work.

In addition, the analysis indicates that 6 (60%) of the inspected construction sites had health and safety plans for the project, while 4 (40%) of the construction sites were found without an OHS plan. However, only 3 (30%) of the construction site's OHS plans clearly stated the scope of the work as opposed to the other 7 (70%) construction sites. The analysis also found out that major work activities were described in the OHS plan of only 3 (30%) of the construction sites comparing to 7 (70%) construction sites with no major activities on construction sites described in the OHS plan.

The analysis further shows that safe working procedures were only available at 3 (30%) of the construction sites, while a majority of 7 (70%) of the construction sites did not have safe working procedures. The analysis also indicates that company safe work procedures relevant to the construction project were found at 2 (20%) of the construction sites unlike at the 8 (80%) construction sites that were without safe working procedures relevant to the project.

Surprisingly, the analysis shows that all 10 (100%) construction sites had neither medical surveillance reports nor sickness absence monitoring procedures. Similarly, no smoking policy existed at all 10 (100%) construction sites. Nonetheless, the analysis indicates that job risk assessment policies existed, but only at 3 (30%) construction sites, while the other and 7 (70%) construction sites did not possess any job risk assessment policies.

Table 5.11 Availability of documents pertaining to the provision of occupational health and safety management in construction sites (N=10)

Elements	Response category	Frequency (n)	Percentage (%)
1 Is there a health and safety policy?	Yes	4	40
	No	6	60
2 Is there an approval letter for construction work by the Ministry of Labour and Social Welfare available?	Yes	7	70
	No	3	30
3 Are copies of the Labour act, 11 of 2007 available?	Yes	5	50
	No	5	50

Elements	Response category	Frequency (n)	Percentage (%)
4 Are copies of the Regulation No 156 (1997) whose regulations relate to the health and safety of employees at work available?	Yes	0	0
	No	10	100
5 Is a health and safety plan for the project available?	Yes	6	60
	No	4	40
6 Is the scope of work clearly stated in the plan?	Yes	3	30
	No	7	70
7 Are the major activities described?	Yes	3	30
	No	7	70
8 Are the types of work described?	Yes	4	40
	No	6	60
9 Are safe working procedures available?	Yes	3	30
	No	7	70
10 Are company safe work procedures relevant to the project?	Yes	2	20
	No	8	80
11 Are medical surveillance reports available?	Yes	0	0
	No	10	100
12 Are sickness absence monitoring procedures available?	Yes	0	0
	No	10	100
13 Is a smoking policy available?	Yes	0	0
	No	10	100
14 Is a job risk assessment policy available?	Yes	3	30
	No	7	70

5.5.1.4 Findings on the availability of documents related to occupational health and safety induction and training at construction sites

As illustrated in table 5.12, the analysis shows that 8 (80%) of the construction sites had neither induction procedures nor any induction modules for new workers, with only 2 (20%) of the construction sites possessing the induction modules. However, the analysis indicates that only 1 (10%) construction site keeps signed registers after workers have completed the induction programme, while a majority 9 (90%) of the construction sites had no register for workers who had completed induction programmes.

The analysis reveal further that 9 (90%) of the construction sites had no registers for periodic safety and health training with only1 (10%) construction site found in possession of an OHS training register that was signed by trained workers.

Table 5.12 Availability of documents regarding induction and training at the construction sites (N=10)

Element		Response category	Frequency (n)	Percentage (%)
1	Are there any induction procedures for new employees stated?	Yes	2	20
		No	8	80
2	Are induction modules or induction course content available?	Yes	2	20
		No	8	80
3	Does the company keep registers signed off by workers who would have completed the induction programme?	Yes	1	10
		No	9	90
4	Are registers for periodic safety and health training available?	Yes	1	10
		No	9	90
5	Are training registers signed by the trained workers?	Yes	1	10
		No	9	90

5.5.1.5 Findings on the availability of policies regarding the psychosocial work environment

The study also reviewed documents in order to ascertain the availability of policies pertaining to psychosocial work environment. The analysis shows that 9 (90%) of the construction sites had no policies for stress management nor for rewarding workers on health and safety promotion, with only 1 (10%) construction site having both policies. The analysis shows further that all 10 (100%) construction sites had no policies seeking to prevent harassment at work, the stigmatisation of HIV infected workers, bullying at work, discrimination based on religious diversity nor a policy preventing ethnic group discrimination.

Further observations regarding the psychosocial work environment were made. The analysis shows that 6 (60%) of the construction sites had a policy allowing workers to register with trade unions, while 4 (40%) construction sites did not have a policy regarding trade union registration. Finally, all 10 (100%) construction sites did not have a wellness policy regarding smoking. The analysis summary is presented in table 5.13.

Table 5.13 Availability of policies regarding the psychosocial working environment in the construction site (N=10)

Elements		Response category	Frequency (n)	Percentage (%)
1	Is a stress management policy available?	Yes	1	10
		No	9	90
2	Is there policy for rewarding workers on health and safety promotion?	Yes	1	10
		No	9	90
3	Is there policy that prevents harassment at work?	Yes	0	0
		No	10	100
4	Is there policy to prevent the stigmatisation of HIV infected workers?	Yes	0	0
		No	10	100
5	Is there policy to prevent ethnic group discrimination?	Yes	0	0
		No	10	100
6	Are there policies that allow workers to register with trade unions?	Yes	6	60
		No	4	40
7	Is there a policy that prevents bullying at work?	Yes	0	0
		No	10	100
8	Is there a wellness policy on the site?	Yes	0	0
		No	10	100
9	Is there a policy that prevents discrimination on religious diversity?	Yes	0	0
		No	10	100
10	Is a smoking policy available?	Yes	0	0
		No	10	100

5.5.2 Findings on the total number of notified accidents and injuries encountered in the construction industry of Windhoek

Documents regarding the construction industry's notified accidents and injuries, such as notification forms, and injury and accident and injury registers, were reviewed to assess the magnitude of the reported occupational accidents and injuries from the construction industry of Windhoek, Namibia. The documents, retrieved from the Ministry of Labour, Industrial relations and Employment creation, focused on Windhoek's construction industry's occupational accidents and injuries for the period April 2011 to March 2016. The findings present the nature or severity of occupational accidents, source of accidents, characteristics of injured workers, nature of injury and the body part that was injured.

5.5.2.1 Nature or severity of occupational accidents from the Windhoek construction industry

The analysis shows that the study period witnessed 22 (59.5%) accidents that were major and required the worker to be absent from work for more than three days. These are followed by 10 (27%) fatal accidents and 5 (13.5%) minor accidents which only needed first aid treatment and no absence from work for three days or more, as displayed in figure 5.21.

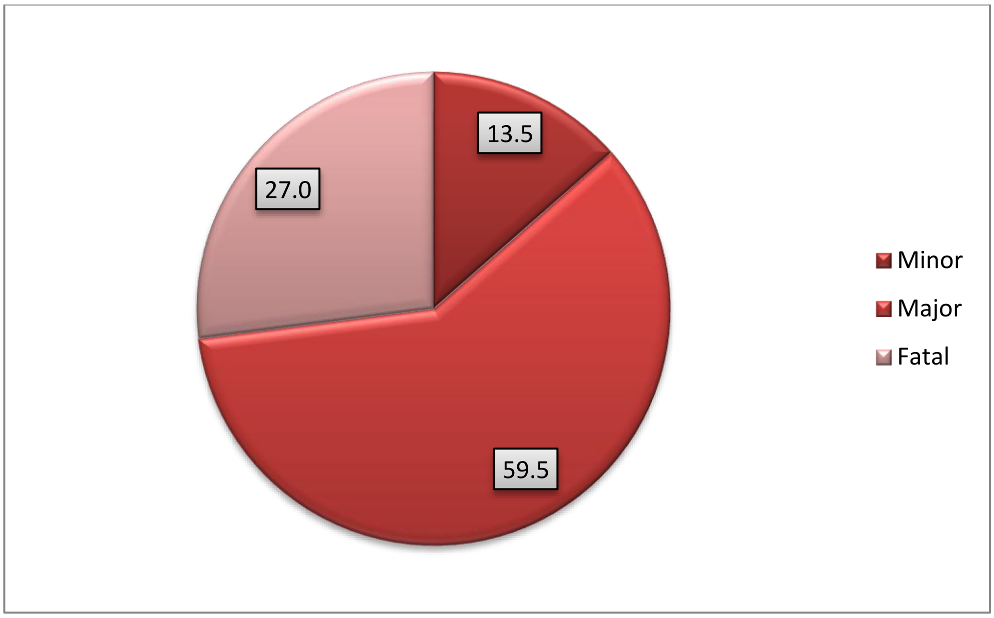


Figure 5.21 Nature or severity of occupational accidents of Windhoek April 2011 to March 2016 (N=37)

5.5.2.2 Source of occupational accidents as depicted in the Windhoek construction industry's notification forms and accident registers

The analysis shows that majority of the accidents types were cut by machinery 10 (27.0%), falls from above 7 (18.9%), hit by falling objects 6 (16,2%) and hit by equipment 4 (10.8%). Furthermore, there were 3 (8.1%) accidents due to slip /trip, while 2 (5.4%) other accidents were due to a fall from the same level, while 1 (2.7%) there were also incidents each for electrocution, hit by collapsed wall, trench burying and hit by moving vehicles. The results of the summary are displayed in figure 5.22.

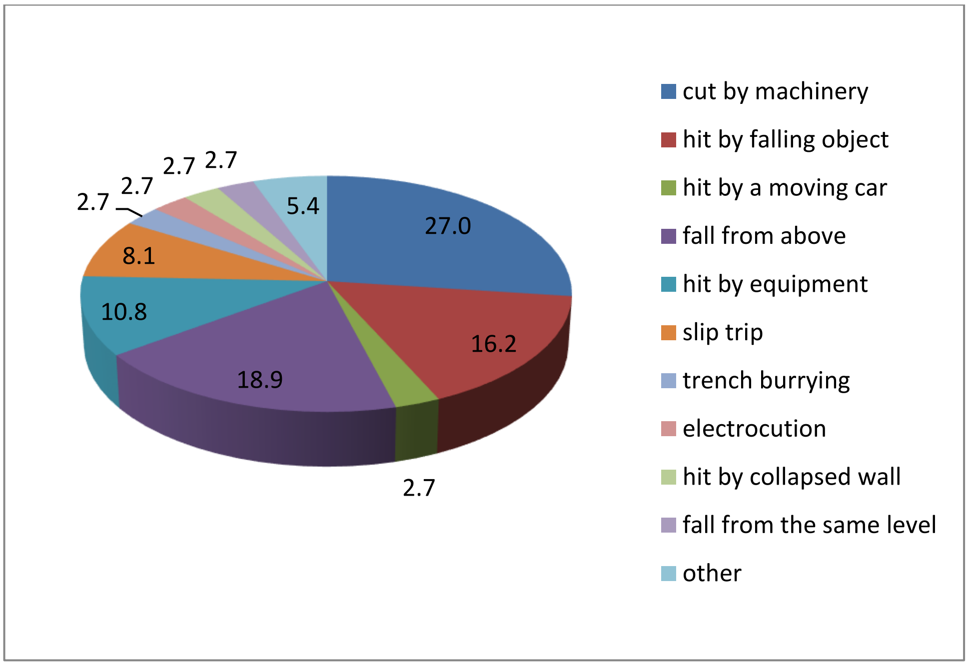


Figure 5.22 Source of accidents in the construction industry of Windhoek April 2011 to March 2016 (N=37)

5.5.2.3 Profile Characteristics of injured construction workers

Table 5.14 illustrates the characteristics of the construction workers injured as emanated from notification forms and accident registers. The analysis shows that 36 (97.3%) males were involved in accidents while only 1 (2.7%) female sustained an accident during the studied period. The demographic analysis shows that workers falling in the 18–59 years range sustained accidents, with 16 (43.2%) of workers aged 18–29 years injured and followed by 12 (32.4%) 30–39-year-old workers who also sustained injuries. Furthermore, the analysis indicates that 8 (21.6%) of the construction workers aged 40-49 sustained injuries, while only 1 (2.7%) construction worker between 50 and 59 years sustained injuries. The mean age of injured workers was 32.54 years.

The occupation of injured workers was also analysed. The findings reveal that 15 (40.5%) labourers were injured, followed by 7 (18.9%) carpenters, 6 (16,2%) in the other categories of workers, and 5 (13.5%) bricklayers. There were also 1 (2.7%) injury each for the painters, electricians, plumbers and engineers.

Table 5.14 Characteristic of injured construction workers (N=37)

Variable	Category	Frequency (=n)	Percentage
Sex	Male	36	97.3
	Female	1	2.7
Age category	18-29	16	43.2
	30-39	12	32.4
	40-49	8	21.6
	50-59	1	2.7
Occupation	Labourer	15	40.5
	Carpenter	7	18.9
	Other category	6	16.2
	Bricklayer	5	13.5
	Painter	1	2.7
	Electrician	1	2.7
	Plumber	1	2.7
	Engineer	1	2.7
Cumulative		37	100

5.5.2.4 Nature of injuries sustained

An analysis of the nature of sustained injuries shows that 8 (21.6%) of the construction workers sustained other types of injuries which include fatalities while amputation and lacerations were sustained by 7 (18.9%) construction workers. The results are displayed in figure 5.23.

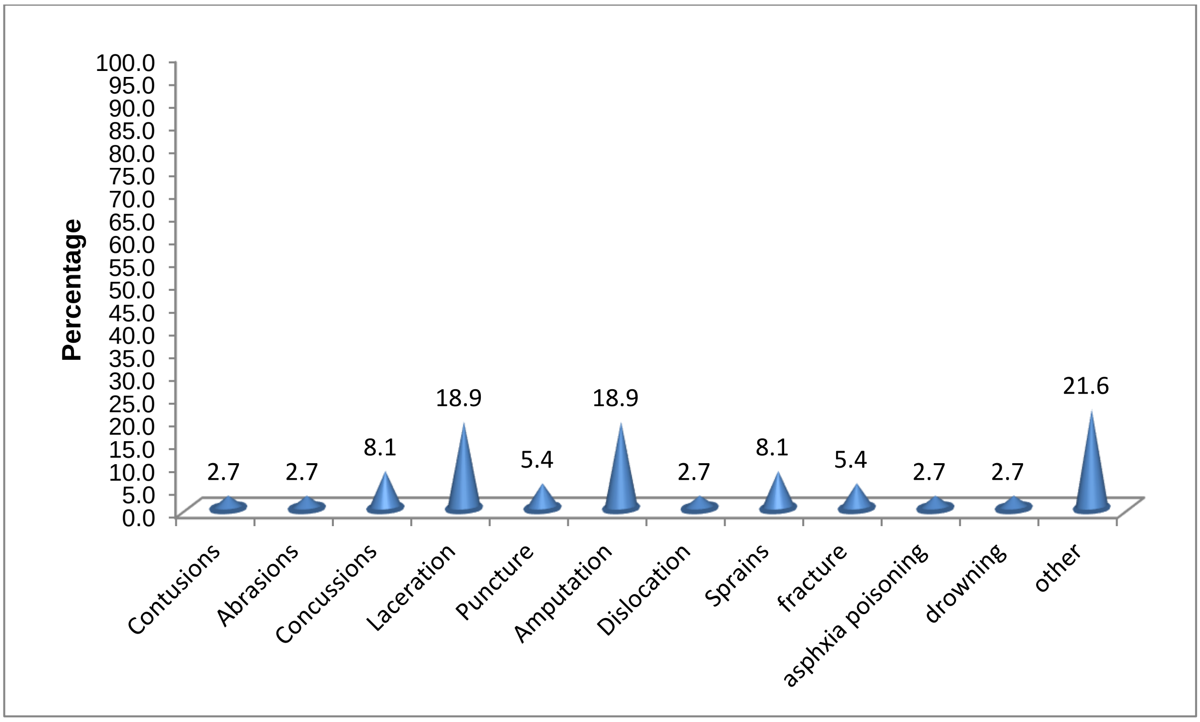


Figure 5.23 Nature of injury sustained (N=37)

5.5.2.5 Body part injured

Analysis of the reviewed records indicates the most injured body part of the affected workers. The findings are that the general body (whole body) accounted for 13 (35.1%) of the injured part and this was followed by finger injuries amounting to 12 (32.4%). The analysis shows further that there were 4 (10.8%) head and hands injuries, 3 (8.1%) injuries to the arms and 1 (2.7%) foot injuries that were reported during the study period, as displayed at figure 5.24.

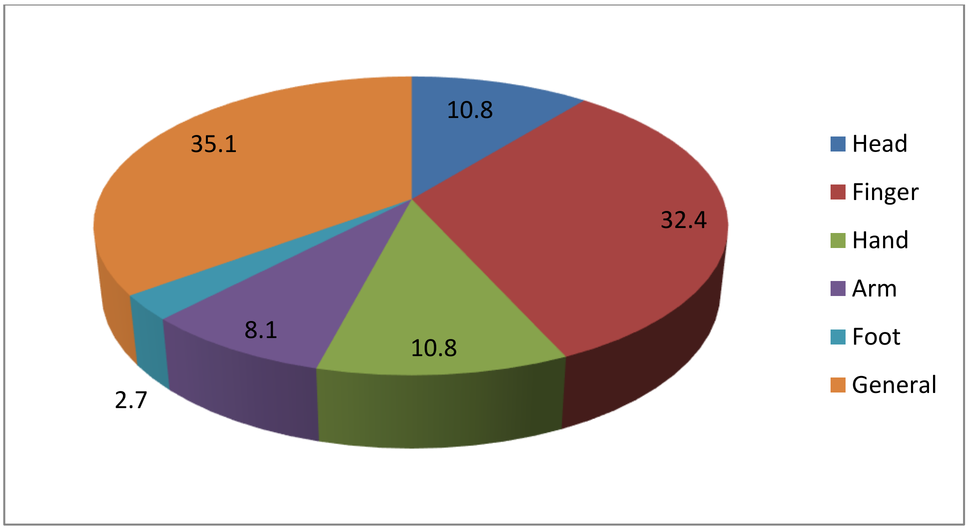


Figure 5.24 Construction worker's injured body part (N=37)

5.6 CONCLUSIONS

This chapter presented the empirical findings obtained through questionnaires, site inspection and from a document review pertaining to the OHS status at construction sites in Windhoek, Namibia. The socio-demographic characteristics of the respondents were presented. The chapter also presented the findings on occupational hazards, accidents and injuries witnessed at the construction sites of Windhoek, Namibia. Finally, the chapter also considered the findings on the construction sites 'compliance with legislation focusing on OHS provision and practice as well as the construction workers' OHS awareness. The following chapter discusses the study findings.

CHAPTER 6

DISCUSSION ON THE RESEARCH FINDINGS

6.1 INTRODUCTION

This chapter discusses the study findings presented in the previous chapter. These findings are discussed in relation to: the socio-demographic characteristics of workers; the participant’s awareness of OHS provision and existence at the study sites; occupational hazards; accidents and injuries; and health problems at the study sites in Windhoek, Namibia. The chapter discusses further, the findings regarding OHS provision and legislative compliance in the construction industries of Windhoek, Namibia.

6.2 DISCUSSION ON FINDINGS

The findings are discussed in line with both the three different data collection tools used in this study and the description of findings done in the previous chapter.

6.3 DISCUSSION ON FINDINGS FROM THE SITE INSPECTIONS

The key findings from the data obtained from the site inspection are discussed below.

6.3.1 Occupational health and safety practices at the construction sites

The findings regarding OHS practices on the study sites such as PPE usage is discussed below.

6.3.1.1 Use of personal protective equipment (PPE) in the construction sites

The current study findings revealed that most of construction workers did not wear PPE while performing work, which put them at risk of hazard exposure. Similar findings are reported by Phoya’s (2012:68) study among Tanzanian construction workers; Cheng, Lin and Leu (2010:441) on Taiwan’s construction industry, where the majority of construction workers were observed not wearing PPE during the studies. However, a study conducted by Acharya (2014:25) on the utilisation of PPE among industrial workers in Nepal found to the contrary that above two-thirds of construction workers regularly used relevant PPE at work.

Furthermore, the findings of this current study indicated that just below one-third of construction sites had a list of workers trained on PPE use, which is almost similar the observations made by Acharya's study (2014:25) on PPE utilisation in Nepal, which indicates that just below one fourth of construction workers were trained on PPE utilisation at workplaces. Training on PPE use is therefore, important if their use is to be effective use.

6.3.2 Nature of occupational hazards in the construction industry

6.3.2.1 Physical hazards

6.3.2.1.1 Noise

The current findings revealed that noise hazards were present at all study sites. Similar findings were reported by several authors, such as Leensen et al (2011:577) with regard to the Dutch construction industry, and Li et al (2016:721) in their assessment of the health impact of construction noise in China, who also found out that noise is a common hazard in the construction industry.

6.3.2.1.2 Dust

The current findings showed that all study sites had dust hazards. Similar findings reported dust as a common hazard in the construction industry, as noted in those from Wu et al (2016:1664) regarding the study about mitigation of construction dust pollution in China and Verbeeck and Ivanon's (2013:80) study that confirms the construction workers' exposure to dust at the construction sites.

6.3.2.1.3 Vibration

The current study found out that all the study sites in Windhoek had vibration hazards. Similarly, authors such as Singh and Khan (2014:239) in their study on India's construction industry, Simeonov et al (2011:672) focusing on the USA's construction workers and Muema et al (2015:81) in their assessment of the construction workers' awareness of OHS hazards in Kenya, reported on the presence of vibration in the construction industry.

6.3.2.1.4 Non-ionised radiation

The present study showed that all study sites had non-ionised radiation hazards. In support, Janicak's (2008:617) investigation of construction industry electrocution-related fatalities in the USA and Geminiani's study (2008:106) on the South African construction industry, reported radiation as a common hazard in the construction industry.

6.3.2.2 Chemical hazards

The current study showed that all the investigated study sites have chemical hazards such as gases, fumes, mist and aerosols. Similar findings were also reported by several authors including, Chi and Han (2013:1037) with regard to the USA's construction industry, Meo et al (2013:1393) in the study on Saudi Arabian construction workers and Tan, Toe and Tseng (2014:113) during their assessment of chemical exposures in Singapore's emergency department. The above-mentioned authors' studies underscored the prevalence of chemical hazards in the construction industry, a reality also observed in the findings from the study on Windhoek's construction industry.

6.3.2.3 Ergonomic hazards

It emerged from the findings of the current study that ergonomic hazards were present at all study sites. Several authors made similar findings and these include Boschman et al (2015:90) in their study on ergonomic measures usage among construction workers in The Netherland, Garcia-Herrrero et al (2012:1765) in their analysis of the influence of working conditions on occupational accidents in Spain, and Hunting, Haile and Nessel''s (2010:307) study on the USA's construction industry. These authors stated that ergonomic hazards were present in the construction industry. Furthermore, Smallwood and Ajayi's (2009:23) study on the South African construction industry and that by Smallwood (2011:29) focusing on the designer's knowledge, perceptions and practices towards construction materials mass and density in SA, found out that ergonomic hazards are a major concern in the construction industry.

6.3.2.4 Hazard identification and control

The current study findings revealed that three-fifths of study sites do not identify hazardous operations. A study conducted by Mwanaumo and Thwala (2012:12) on Botswana's construction industry which reveals that construction workers lack the awareness of hazard identification support the findings of this study. However, the current study finding is against the findings from Ngamthampunpol's (2008:71) studyon the Thai construction industry, whereby risk assessment and job safety analysis was found to be conducted at the majority of the studied construction sites.

The current study revealed further that safety checks were carried out before work commenced at only two-fifths of construction sites. A previous study conducted in Uganda reported a similar finding which indicates that safety checks were carried out at only 14% of the construction sites (Irumba 2014:112). A different observation in reflected in the study findings by Phoya (2012:88) regarding the Tanzania construction industry where safety teamsfrom the majority of construction sites were found to conduct safety checks that involved going around the sites to identify potential hazards and put up control measures such as barricade the hazards.

Furthermore, this current study revealed that surveys to determine the noise levels were not conducted at all study sites. This study finding, however, differs from Zhang, Zhai and Yang's (2014:92) which determined the noise level at the construction sites on China's construction industry which found that the country's construction industry conducted noise surveys.

The performance of activities seeking to prevent the generation of dust was also observed to be taking place at half of the study sites. This finding regarding the current study is differ in the study by Wu et al (2016:1665) which assesses the source and mitigation of construction dust in China and found out that the majority of construction workers were not aware of dust mitigation measures.

6.3.3 Occupational health and safety provision at the study sites

6.3.3.1 Occupational health and safety management system

The current study findings indicated that three-fifths of construction sites have appointed OHS officers. This finding is different from the study by Irumba (2012:112) on Uganda‘s construction industry which found that only 30% of construction sites appointed OHS officers.

6.3.3.2 Welfare facilities provision

The current study indicated that only one-third of the study sites have adequate toilet facilities demarcated for males and females. This finding is almost similar to that from Baruah’s (2010:208) study on the opportunities and challenges faced by women in India’s construction industry that found out that over two-thirds of construction sites had no toilet facilities.

6.3.3.3 Electric safety

The current study findings show that no portable electrical equipment was safely checked and tagged for the next inspection at all study sites. According to the Work Safe Bc (2008:28) report, all portable electrical equipment should be tested on regular bases and tagged to indicate the name of the competent person who conducted the testing and the date for the next inspection should be indicated.

6.3.3.4 Work equipment safety

It emerged from the current study that only one fifth of construction sites had inspection records for work equipment kept on site. The section 59 to 62 of the Regulations relating to health and safety of employees at work (No 156 of 1997) stipulate that an employer must ensure the safety of machinery at work by safeguarding, training and educating workers about the machinery, as well as maintaining and controlling the machineries.

6.3.3.5 Emergencies preparedness

Findings from this current study show that three-fifths of study sites have emergency plans and lists of contact details for the ambulance, fire and police services in case of emergency, and there were arrangements with the hospitals and ambulance in case of emergency referrals. The current study findings are similar with the requirement by ILO-OSH (2001:12), which states that emergency plans and response arrangements should be established and maintained at all workplaces.

Surprisingly, it emerged, from the findings of this current study that, all study sites had no safety box minutes. The lack safety box minutes contrasts with the study conducted by Olson et al (2016:122) in the USA to investigate the toolbox talk in fatality prevention which found out that 75% participants indicated that tool box talks were conducted at construction sites.

6.3.3.6 Provision of first aid services

The findings of this current study illustrated that no trained certified first aider was found at the majority of study sites and first aid manuals were only available at few study sites. This supports Irumba's (2014:112) study on the Ugandan construction industry, which found out that the majority of construction sites had no first aiders.

6.3.3.7 Fire safety services

The current study findings showed that all study sites had no fire warden and no fire drills were performed nor recorded for workers to know what is required in case of a fire. Furthermore, the findings of the current study showed that the majority of study sites had fire extinguishers available; however, most of these fire extinguishers had expired. The current study findings are against the requirements of the provision of regulation 43 (3) for the Regulations relating to health and safety of employees at work (No 156 of 1997) which states that an employer is required to ensure that fire extinguishers are accessible at workplaces, maintain and guarantee that they are in good working order, and instruct workers on the proper usage of fire extinguishers.

6.4 DISCUSSION OF FINDINGS FROM QUESTIONAIRE

The study findings obtained from the questionnaire are discussed in this subsection.

6.4.1 Socio-demographic characteristics of participants

6.4.1.1 Participant's gender distribution

The findings from this current study showed that male participants were significantly more that female participants. This finding is consistent with several demographic data about the construction industries such as that found in Hong Kong (Lee 2010:25), reported by the ILO (2015:1), as well as the demographic data evident in Watts' (2009:512) study on women managers in the UK construction industry and that by Roche et al (2015:124) examining workers' alcohol use in male-dominated industries in Australia, which all underscore that the construction industry is male dominated. However, Baruah's (2010:198) study reflects contrasting demographics findings as it states that the construction industry in India is female dominated with women constituting 51% of the construction workers.

6.4.1.2 Age distribution of participants

The findings of this current study revealed that more than two-fifths of the participants were aged between 18 and 39 years. This study finding is almost similar to that from a study conducted on Tanzania's construction industry where 56.3% of the participants were in the 25-35 age range (Phoya 2012:67). Similarly, Miller's (2012:21) studies which assess the educational safety training solutions for Latino construction workers found out that an overwhelming majority 78% of the participants were younger than 40 years.

However, the current study finding contrasts with that from the studies conducted on South Africa's construction industries by Eppenberger and Haupt (2009:6) and South Korea by Yoon et al (2013:204) in which the majority of participants were found aged above 40 years.

6.4.1.3 Marital status of participants

The current study findings indicated that just below two-thirds of the participants were single. The findings concur with that from the study conducted on the Portuguese construction industry which stated that the industry mostly employs single young men (Arezes & Bizarre 2011:10). This current study finding is however, unlike that from Rahmani et al (2013:162) in their study on accidents among electricity distribution company workers in Iran, and Liao and Chiang's (2016:132) on ways to reduce occupational injuries in the Taiwanese construction industry, which both show that63% and 63.7% construction workers, respectively, were married.

6.4.1.4 Participant's education level

The findings regarding the education levelshow that just above half of workers in the construction industry obtained secondary education. The findings are in agreement with those from the study conducted on the Saudi Arabian construction industry that revealed that 45.5%of the participants completed secondary education while 33.3% completed primary education (Alghadir & Anwer 2015:2). Unlike with the current study, Phoya's (2012:67) study on the Tanzanian construction industry found out that less than half of the workers had completed primary education. Furthermore, the study conducted by Rahmani et al (2013:162) on Iran's construction industry also noted that most of the participants 46.2% had diploma qualifications.

6.4.1.5 Participant's occupation

This current study finding indicated that bricklayers represent the highest number of workers followed by labourers. Similar findings have been reported in a study conducted by Himalowa and Frantz (2012:30) in their assessment of the functional activities 'effect on occupationally-related low back pain among male manual workers in South Africa's construction industry, which shows that 46%of the participants were masons.

However, the findings of this current study are different from the findings of a survey conducted among Saudi Arabian construction workers, which indicated that the majority of participants were manual labourers (25.5%) and that these were followed by plumbers

(17%) (Alghadir & Anwer 2015:2). Another finding from the study conducted by Herbert and Iipumbu (2009:22) in Namibia shows that the majority of participants were labourers.

6.4.1.6 Employment status of participants

The findings of the current study indicated that the majority of participants were employed on a permanent basis. This contradicts several authors' that stated that the majority of construction workers work on a temporary or casual basis (ILO 2015:12) report, a situation also noted by Phoya (2012:68) with regard to Tanzania and Rahmani et al (2013:162) in Iran. Nevertheless, the study conducted among the Chinese construction industry in Namibia shows that the majority of workers did not know whether they were recruited on casual or permanent basis as they were not informed about their employment status by the employers with some not having contracts at all (Herbert & Iipumbu 2009:23).

6.4.2 Participant's awareness of occupational health and safety (OHS) existence on study sites

6.4.2.1 Occupational health and safety policy availability as reported by participants

Just below three-tenths of the current study's participants indicated that they were not aware of the existence of OHS policies at their workplaces. This finding is similar to Herbert and Iipumbu's (2009:28) in their study on a Namibian construction industry, which found out that the majority of construction workers were not aware of the existence of OHS policy or OHS related documents. In contrast, Niskanen, Naumanen and Hirvoen (2012:834) conducted a study to evaluate European Union legislation concerning risk assessment and preventive measures in OHS, which found out that an overwhelming majority (88%) of the participants were aware of OHS policy availability at their workplaces.

6.4.2.2 Occupational health and safety policy accessibility as reported by participants

The current study findings indicated that the majority of participants' viewed the OHS policy as not accessible. The current study findings are contradicting the provision made in regulation3 of the Regulations relating to health and safety of employees at work (No 156 of 1997) which states that it is the employer's responsibility to ensure that the OHS policy is accessible.

6.4.2.3 Occupational health and safety training as reported by participants

The current study findings showed that just below two-fifths of the participants indicated that they had OHS training. The findings are similar with several authors findings from construction industries studies such as Cheng et al (2012:218) who noted that only 25% of workers were found to have been trained on OHS in Taiwan, while Irumba (2014:112) pointed out that 45% of workers in Uganda, and Phoya (2012:69) stated that 25% of Tanzania's had had the training.

However, the findings contrast Miller's (2012:24) that all respondents, in the assessment of educational safety training for Latino construction workers, had received OHS training.

6.4.2.4 Occupational health and safety representatives as reported by participants

The current study's finding showed that more than three-fifths of the participants were not aware of the availability of health and safety representatives at their respective work sites. This finding is different from that derived from an assessment of the impact of OHS in the Spanish construction industry, which revealed that the majority (85.3%) of construction workers were aware of the existence of OHS representatives at their workplaces (Ollé-Espluga et al 2015:57).

6.4.2.5 Occupational health and safety officers as reported by participants

It emerged from the findings of the current study that three-fifths of the participants were not aware of the OHS officers at their sites. This is different from Ngamthampunpol's (2008:54) study on the Thai construction industry, which found out that the majority (87.68%) of the participants were aware of the availability of OHS officers at their respective construction sites. However, this current study's findings do not concur with that from Irumba's (2014:112) study on Uganda construction industry where only a few OHS officers were employed at 30% of the construction sites.

6.4.2.6 Safety talk attendance as reported by participants

The findings of this study indicated that four-ninths of the participants indicated that they had attended safety talks at their work and study sites. The findings are different with that from an evaluation of toolbox talks on fatality prevention in the USA's construction industry carried out by Olson et al (2016:122) that found out that 25% of the employers never conducted safety talk.

6.4.2.7 Participant's awareness of emergency preparedness and first aid services provision at construction sites

The results of this current study indicated that the majority of participants had never attended emergencies training at work. According to the Work SafeBc (2008:41) report, workers should be trained on emergencies that can happen at work. Furthermore, the ILO-OSH (2001:12) states that the employer should ensure that workers are involved in activities focusing on their own safety, which include unawareness of emergency issues, so that they will be able to act properly during emergencies.

6.4.2.8 Participants' awareness of hazard reporting and control

The findings from this current study indicated that just below two-fifths of the participants indicated that they knew that hazard control is performed at workplaces. The current study finding is in contrast with that from Ngamthampunpol's (2008:69) study on the Thai construction industry where the majority of the respondents (92.03%) indicated that proper engineering technique was used on the construction sites to control hazards.

6.4.3 Occupational health and safety hazards in the construction industry as reported by participants

6.4.3.1 Physical hazards

6.4.3.1.1 Noise hazards as reported by participants

A current study showed that the significant majority of participants indicated that noise was a common physical hazard at the study sites. This study finding is also evident in Leensen et al (2011:577) observations in the Netherland and Li et al (2016:721) in China, where noise is also noted as a common health hazard in the construction industry. Opposing this current study finding, however, is the research conducted by Garcia-Herrero et al (2012:1763) on Spanish construction industry where only 36.53% of the participants indicated the presence of noise at the construction sites.

6.4.3.1.2 Dust hazards as reported by participants

Dust was indicated by participants as a common physical hazard at the study sites. Similarly, a study on the construction industry by Zeng et al (2008:1157) and Verbeek and Ivanon (2013:80) reported findings that dust is a common physical hazard in the construction industry.

6.4.3.1.3 Vibration hazards as reported by participants

The findings from the current study revealed that the majority of participants indicated that vibration was not a common hazard at the study sites. The findings are similar with that from a previous study in Spain which found out that only one-fifth of the participants reported the presence of vibration at the construction sites (Garcia-Herrero et al 2012:1763).

In contrast, participants in Paschold and Sergeev's (2009:171) study determining the knowledge of Whole-body vibration among OHS professionals in the USAindicated that vibration is a common physical hazard in the construction industry. In addition, Singh and Khan's (2014:239) assessment of the effectiveness of drill machine handle coating on vibration transmissibility in India indicated vibration as a common hazard in the construction industry.

6.4.3.2 Chemical hazards as reported by participants

It emerged, from the findings of this current study that, an overwhelming majority of the participants indicated that chemical hazards were present at the study sites. The findings are similar to those from studies conducted on the construction industry, such as the Ahmad et al (2013:239) study on knowledge and research information sharing on construction health and safety practices in Malaysia, and Phoya's (2012:35) study on Tanzania's construction industry, which both reported the prevalence of chemical hazards in the industry.

6.4.3.3 Psycho-social hazards as per participants

The results of this current study showed just above one tenth of discrimination and below one tenth of victimisation at the study sites. On the contrary, several studies have shown that discrimination and victimisation is a common psycho-social hazard in the construction industry as noted in Herbert and Iipumbu (2009:24) on Namibia, Meo et al (2013:1394) on Saudi Arabia and Phoya (2012:35) on Tanzania.

6.4.4 Occupational accidents at the study sites as reported by participants

6.4.4.1 Falls from above

The current study findings indicated that falls from above were reported by a fifth of the participants. In contrast, Cheng et al (2010:438) in their study on Taiwan's construction industry reported the prevalence of falls from above and that they were the major cause of and accounted for 54% of the accidents. Furthermore, Gürcanli and Müngen (2013:585) analysed construction accidents in Turkey and found out that falls were the most common accident in the construction industry as noted by 53.7% of the participants. In addition, Kaskutas et al (2010b:561) in their study on fall prevention among apprentice carpenters in the USA and found out that falls from above was the most common accident sustained in the construction industry as reported by over half of the participants.

6.4.4.2 Electrocution

The current study findings indicated that electrocution-related accidents were reported by only one-ninth of the participants. Similar findings were reported by the Occupational Safety and Health Administration, cited in Fass et al (2016:3) which stated that electrocution was among the top four cause of accidents in the USA and contributed to 8.1% of the country's construction industry fatalities. In contrast, Janicak's (2008:619) investigation on occupational fatalities due to electrocution in USA reported that electrocution is a major cause of fatal accidents in the construction industry, with 49% of electrocution-related accidents occurring in the USA during the period 2003-2006. Furthermore, Zhao et al (2015:150) conducted a study to analyse the control measures of electrical hazards in the USA from which electrocution was reported as a common accident in the construction industry.

6.4.4.3 Being struck by moving objects

The results of this current study indicate that being struck by moving objects was reported by only one-ninth of the participants. The findings are unlike those from Hinze and Teizer's (2011:712) study on construction equipment-related fatalities in the USA's construction industry where 87.7% of the fatalities were related to cases of being struck by moving objects.

6.4.4.4 Being cut by machinery

The results from the current study revealed that cuts by machinery were reported by only below one seventh of participants. This is unlike in a study by Aneziris et al (2013:382) on the Dutch construction industry where cuts by machinery were reported as major causes of accidents. Furthermore, Phoya's (2012:32) study on OHS in the Tanzanian construction industry reported that cut by machinery was a common accident.

6.4.4.5 Being struck by falling objects

The current study's findings indicated that one-eighth of the participants had witnessed some struck by falling objects accidents at their construction sites. These study findings are supported by Cheng et al (2012:217) in their exploration of the factors contributing to construction industry injuries in Taiwan, where they noted that being struck by falling objects was not a common accident as it only accounted for 5% of accidents. Similarly, Gürcanli and Müngen's (2013:584) study on Turkey's construction industry reported that 12.9% of the accidents were related to being struck by falling objects. In contrast, being struck by falling objects was stated as the most common in the study on the US construction industry activities over a seven-year period conducted by Lipscomb et al (2010:192).

6.4.4.6 Motor vehicle crashes

The findings of the current study showed that the occurrence of motor vehicle accidents at the study sites were reported by few participants. This current study's finding concurs with that from the Gürcanli et al (2008:378) study on Turkey's construction industry, which revealed that motor vehicle accidents were not a common accident in the construction industry. However, Al-Thani et al (2015:1807) argued to the contrary that motor vehicle crashes are one of the common causes of accidents in Qatar's construction industryas 22% of Indian and 17% Nepalese workers reported that they had been involved in motor vehicle accidents over a four-year period.

6.4.4.7 Trench burying accidents

The current study findings indicated that few participants reported on the occurrence of trench burying accidents at the study sites. The finding is contrary to Gürcanli and Müngen's (2013:589) study on Turkey's construction industry that noted trench burying as a common cause of accidents in the construction industry and accounting for 4.6% of the fatalities and 2.8% of the non-fatal injuries.

6.4.5 Nature or type of health problems reported by participants

6.4.5.1 Back pain

The current study findings indicated that back pain was experienced by three-fifths of the participants. This finding is in agreement with that from a study by Alghadir and Anwer (2015:2) which assesses the prevalence of musculoskeletal pain among Saudi Arabian construction workers that revealed that 50% participants had back pain. In addition, Boschman et al (2012:5) investigated MSDs among Netherlands' construction workers and found out that back pain is a common health problem as it was reported by 53% of the bricklayers and 33% of the supervisors. Nevertheless, leg pain was reported as a common health problem by 35% of the participants in the study by Meo, Alsaaran, Alshehri, Khashougi, Almeterk, Almutairi and Alsaeed (2013:1396) on the Saudi Arabian construction industry, compared to 31.2% who had reported on suffering from back pain.

6.4.5.2 Difficulty in breathing

The current study's results indicated that a below two nineth of the participants reported that had difficulties in breathing. The current study finding concurs with that from Akram's (2014:102) study on occupational diseases and public health concerns of migrant construction workers in India, where by 7.7% of the participants reported respiratory problem as a common health problem. Furthermore, a study by Pesantes-Tavares (2011:19) on the USA's construction industry reported difficulties in breathing as a common health problem.

6.4.5.3 Skin problems

It emerged that, from the findings of this current study, only a few participants amounting to one-fifth of the total participants indicated that they had experienced skin problems. The prevalence of skin problem as ales common ill health in the construction industries is also noted in the study conducted Akram (2014:102) on the Indian construction industry, where it is reported on by 5% of the construction worker participants.

6.4.5.4 Difficulty in hearing

The current study's findings show that below one sixth of the participants had experienced difficulties in hearing. The findings are supporting the study conducted by Muema et al (2015:79) to assess the construction workers 'awareness of occupational hazards, illness and injuries associated with the construction industry in Mombasa, Kenya, which found out that very few (3.3%) construction workers had hearing impairments.

6.4.6 Occupational health and safety provision at the construction sites as reported by the participants

6.4.6.1 Provision of welfare facilities on construction sites as reported by participants

It emerged from the findings of the current study that an overwhelming majority of participants indicated that toilet facilities were provided at the study sites. In contrast to this study's finding, inadequate welfare facilities in the construction industry were reported by 55% of the participants in Baruah's (2010:208) study among women in India's construction industry. Moreover, Abrey and Smallwood's (2014:7) study on the assessment of the effects of unsatisfactory working condition on the construction industry's productivity in South Africa, reported that there is lack of adequate welfare facilities in the construction industry. Effects of Unsatisfactory Working Conditions on Productivity in the Construction Industryffects of Unsatisfactory Working Conditions on Productivity in the Construction Industry.

6.4.6.2 Provision and usage of personal protective equipment (PPE) as reported by participants

This current study showed that the majority of the participants indicated that they were provided with PPE, free of charge. The findings are also confirmed in related literature such as Phoya (2012:69) which indicate that workers were provided with PPE in one construction site studied as case study. This observation contradicts the findings from the study by Herbert and Iipumbu (2009:34) on the Chinese investments in Namibia, where they state that the majority of construction workers were not provided with PPE.

The current study showed further that the majority of participants stated that they were regularly using PPE during their work activities. This current study finding concurs with the findings by Acharya (2014:25) regarding the Indian construction industry where 68.1% of the participants indicated that used PPE regularly. However, the current study results differ with Phoya's (2012:69) study in Tanzania where 90% of the participants indicated that wearing PPE affected productivity which possibly influenced them to choose not to wear PPE. In addition, a study by Rahmani et al (2013:161) on Iran's construction industry, shows that only one-third of the participants indicated that they were using PPE every time when working.

6.4.7 Demonstration of corporal social responsibility at the study sites as reported by participants

The current study's results indicated that a few participants had received waste disposal training. The current finding is different from that noted in the study conducted by Udawatta et al (2015:77) to determine the nature of waste management at Australian construction projects, which found out that training and education on waste management was highlighted by the majority of participants as the best strategy to prevent environmental denigration.

6.4.8 Participants' views on the improvement of the construction industry's occupational health and safety

The findings of this current study showed that participants' proposals on what they thought could be done to improve the construction industry's OHS, as discussed here under.

6.4.8.1 The need for occupational health and safety programme implementation elicited from participants

The findings of this current study showed that two-sevenths of the participants indicated the need for construction companies to implement OHS programmes at the construction sites. The view is in agreement with the requirements of regulation 3 of Regulations relating to health and safety of employees at work (No 156 of 1997). Regulation 3 states that it is the employer's responsibility to establish an OHS programme and OHS policy development at the construction sites.

6.4.8.2 Occupational health and safety training of construction workers as per participants

The findings of this current study showed that one-sixth of the participants underscored the importance of conducting OHS training. Similarly, Bahn and Barrat-Pugh's (2012:337) evaluation of the mandatory construction industry training programme in Australia noted that 96%of the participants mentioned the importance of OHS training in accident prevention. In addition, Taylor's (2015:66) assessment of the impact of the mandatory OSHA 10hour training in the USA found out that training benefited the construction industry with regards to accident and injury preventions.

6.4.8.3 Provision of medical services to construction workers as indicated by paticipants

This current study showed that one-sixth of the participants indicated the need for the provision of medical services to construction workers. The findings are in line with the provision of regulation 219 of the Regulations relating to health and safety of employees at work (No 156 of 1997) and the WHO (2010:19) requirement that the employer should provide medical surveillance to their employees.

6.4.8.4 Provision of welfare facilities as indicated by participants

The findings of this current study indicated that two-ninths of the participants stated the need for adequate provision of welfare facilities.

6.4.8.5 Personal protective equipment (PPE) provision as elicited from participants

It also emerged, from the current study findings that, more than two-ninths of the participants indicated that the provision of PPE would improve the OHS in the construction industry. This is also noted in the Fan et al (2012:1289) study on the Hong Kong construction industry that concluded that PPE should be used to reduce the occupational hazard exposure levels.

6.5 FINDINGS FROM DOCUMENT REVIEW

6.5.1 Construction sites document review findings

6.5.1.1 Personal health resources documents on the study sites

The current study findings showed that job descriptions which state the OHS responsibility of each worker were only available at one-fifth of the study sites. This contradicts the findings from Ngamthampunpol' (2008:51) assessment of safety management in the Thai construction industry, which indicated that the OHS responsibilities of all employees were clearly defined in all job descriptions.

6.5.1.2 Documents regarding hazard identification and control on study sites

The findings of this current study showed that accident registers were found at only one-fifth of the study sites. The findings are against the statutory requirement of the regulation 22 (1) (a) and 6 (1) and 25 (1) (1) (b) of the Regulations relating to health and safety of employees at work (No 156 of 1997) that state that it is the responsibility of the employer to notify the chief inspector about accidents that would have occurred at the workplaces and to keep the register of accident occurrence for a period of five years.

The current study findings indicated that three-tenths of the considered construction sites had incident reporting procedures. The findings are largely against the ILO-OSH (2001:8) guideline which states that all organisations should maintain the documents regarding occupational health and safety management system such as documents regarding work-related injuries.

It was noted from the findings of the current study that, checklists for workplace inspection were only available at few study sites. The findings are against the report by Work Safe Bc (2013:10) which states the importance of using a checklist for inspection in order to standardise the worksite inspection and to ensure that the inspection is completely conducted.

Moreover, the findings from the current study indicated further that written procedures on the action that must be taken after workplace inspection were not found at any of the study sites. According to the report by Work Safe Bc (2013:3), any hazard or risk identified during the site inspections should be addressed immediately following that organisation's written safe working procedure.

6.5.1.3 Documents pertaining to the provision of occupational health and safety management at study sites

The current study findings showed that only two-fifths of the study sites had a health and safety policy. This concurs with the findings from a study by Annan, Addai and Tulashie (2015:2) conducted in Ghana where they identified that there was a challenge regarding the adoption of an OHS national policy. However, study by Niskanen et al (2012:834) on European Union OHS legislations show that 95% of participants indicated that they had access to OHS Act. The findings also surprisingly showed that all study sites had no medical surveillance reports.

The findings are in contrast with the requirement of the regulation 219 of the Regulations relating to health and safety of employees at work, which calls for the employer to arrange for pre-employment screening, periodic medical examination and exit medical examination free of charge to the workers. The current study findings indicated that job risk assessment policies were found at a few study sites only. The findings are against the requirement of the National occupational health policy of Namibia (2006:11) which indicates that it is the responsibility of the employer to develop a policy addressing the identification of hazards by means of risk assessments.

6.5.1.4 Documents related to occupational health and safety induction and training on study sites

The current study findings indicated that the majority of study sites had no induction procedures. The findings are similar with the those from a study conducted by Herbert and Iipumbu (2009:29) on the Namibian construction industry, where by the majority of participants indicated that they were not given formal induction but were instructed to learn from the older workers tasked with showing them the industry's ropes. Contrary to this, however, is the study by Niskanen et al (2012:834) which, in its evaluation of the European Union (EU) legislation on risk assessment and OHS preventive measures, found out that the 89%of the participants confirmed that they had been trained and oriented on safety at work.

6.5.1.5 Documents regarding psychosocial work environment on the study sites

The study findings revealed that the significant majority of study sites did not have policies seeking to promote the psychosocial wellbeing of workers. The findings contravene section 5 (2) of the Labour Act of Namibia (Act No 11 of 2007) which prohibits any form of discrimination against any individual at work.

6.5.2 Document review for notified occupational accidents and injuries from the construction industry of Windhoek

6.5.2.1 Characteristics of injured construction workers

6.5.2.1.1 Sex of injured worker

This current study finding showed that an overwhelming majority of males in the Windhoek construction industry were injured. Similar findings are reported in studies on the construction industries, such as that Cheng et al (2012:218) on Taiwan where 96% of the injured workers were male and another by Ling et al (2009:720) where all the worker fatal injuries in Singapore were male. However, the study by Baruah (2010:207), on the Indian construction industry indicated, to the contrary, that females sustained most of the occupational injuries.

6.5.2.1.2 Age of injured construction workers

It emerged, from this current study's findings that, about three-sevenths of the workers aged 18-29 sustained more injuries than any other age categories. This findingis almost similar to that from a study conducted on China's construction industry by Chen and Tian (2012:531) which found out that about three-eighths of construction workers under 25 years had sustained injuries. However, the current study findings are contrary to those from the Cheng et al (2012:218) study on Taiwan's construction industry which stated that 31% of the injured construction workers were aged between 35 and 44 years. However, Eppenberger and Haupt (2009:9), in their studyon the South African construction industry, found out that 68.7% of the workers who sustained injuries were less than 40 years.

6.5.2.1.3 Occupation of injured construction workers

The results of this current study indicated that two-fifths of the labourers sustained injuries more than other occupation categories. This study finding is similar with that from a study conducted by Choi (2015:152) that, in its investigation on the trade-related injuries in the UK during 2004-2006, found out that more than four-ninths of labourers were injured, which is higher than in any other occupation.

6.5.2.2 Nature or severity of occupational accidents in the Windhoek construction industry

The current study's findings also showed that major accidents were the most common and responsible for nearly three-fifths of accidents. The findings are contrary to the study findings by Fass et al (2016:11) in which incidents of minor accidents were noted as higher (29.1%) in the Arabian Gulf region.

6.5.2.3 Source of occupational accidents as retrieved from the documents

Current study findings indicated that being cut by machinery was the common accident, but it was responsible for just two-sevenths of the accidents. The findings from this present study are similar to those from Chinniah's (2015:169) study regarding the analysis and prevention of serious and fatal accidents related to moving parts of machinery in Canada that established that cuts by machinery accounted for 70.8% of the fatalities. On the contrary, several construction industry studies have shown that the common source of accidents are falls as confirmed by Cheng et al (2012:216) with regards to the observed conditions in Taiwan, Chi and Han (2013:1032) on the USA and Gϋrcanli and Mϋngen (2013:586) on Turkey.

6.5.2.4 Nature of injury sustained

The findings from this current study indicated that other nature injuries, which include sustained fatalities, were common and accounted for one-fifth of the cases. Contradicting this current study finding is a previous study conducted by Choi (2015:152), which in its analysis of aging workers' and trade-related injuries in the US construction industry, found out those sprain/strains were the most common nature of injury sustained by one-third of the construction workers.

6.5.2.5 Body part injured

The results of this current study indicated that the most injured body part was the whole body, which represents three-eighths of the total cases and followed by injuries to the fingers, which accounted for one-third. The findings are, however, different from those arising from Choi's (2016:152) study on the USA's construction industry which found out that the most injured body part of workers in the construction industry were fingers and these accounted for 26%of the incidents followed by injuries to the back, which stood at 10%.

6.5.3 Document review for notified occupational diseases from the construction industry of Windhoek

The researcher's endeavours during the retrospective document review for occupational diseases from the construction industry of Windhoek, Namibia, did not show any evidence of reported occupational diseases.

6.6 CONCLUSION

The chapter discussed the findings of the current study. It focused on the findings from the site inspections, questionnaires and document reviews. The chapter also discussed the presence of occupational hazards on the study sites and the measures used for hazard identification and control. In addition, the chapter also deliberated on the socio-demographic status of the participants, participant's awareness of OHS existence and provision, occupational health problems, the provisions of OHS at the study sites such as PPE provision, and the occupational accidents in the construction industry. The chapter also discussed the findings regarding the construction industry OHS documents at the study sites, and the documents on the occupational accidents, injuries and diseases from the Windhoek construction industry elicited from the Ministry of Labour, Industrial relations and Employment creation, as well as documents pertaining to occupational diseases from the construction industry.

The next chapter presents the conclusion, recommendations, study contributions and the limitations to the study.

CHAPTER 7

SUMMARY, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS OF THE STUDY

7.1 INTRODUCTION

This chapter presents a summary of the conclusions and outlines the recommendations on how to improve OHS in the construction industry, which are drawn from the study's findings. It also describes the contribution that the study makes in the field of OHS and presents the area for further research as well as the limitation of the study.

7.2 SUMMARY

In pursuing the objectives of the study, the researcher used a questionnaire, document review and site inspection checklist in order to collect data in three different ways. The current study revealed that the OHS status in the construction industry of Windhoek, Namibia is in poor status due to a higher rate of occupational accidents and injuries. Furthermore, workers are exposed to physical, chemical, ergonomic and psychological hazards and yet there are limited exposure preventive measures. In addition, lack of participant's awareness on relevant aspects of OHS is hindering the promotion of OHS in the study sites. Moreover, a majority of the study sites and the participants are non-compliant with OHS legislations.

7.2.1 Summary of findings

7.2.1.1 Findings related to participants' demographic profile

The findings concluded that the construction industry in Windhoek, Namibia, is male dominated and only employ a few female workers. Another conclusion drawn from the study is that a majority of the construction workers are young workers.

The study also found out that a higher number of single people are recruited in the construction industry. In addition, the findings revealed that many participants had secondary education.

7.2.2 Findings related to participant's awareness of occupational health and safety (OHS) policy existence

Most workers were not aware of the availability of OHS policies in the study sites and a majority of the participants indicated that the OHS policies were not accessible. In addition, it emerged from the current study that a majority of the participants were not aware of OHS training been conducted on the study sites and many had not attended any safety talks at the study sites. The study findings also revealed that a majority of the workers were not aware of the availability of health and safety representatives nor the OHS officers at the study sites.

7.2.3 Findings related to occupational health and safety hazards prevalent at the study sites

The study revealed that there were physical hazards such as noise, dust, vibration and non-ionized radiation at the study sites. Furthermore, it was observed too that most majority of study sites had no mechanisms to control some of these existing physical hazards. Most of the study sites were observed as having chemical and ergonomic hazards.

7.2.3.1 Findings related to hazard identification and control on study sites

A conclusion drawn from the study is that there were no identification of hazard operations and hazard identifications were lacking at many study sites. Furthermore, the findings indicated that a majority of the study sites did not have accident registers, accident investigation procedures, and injury on duty reporting forms a checklist for workplace inspection nor incident reporting forms.

It is also concluded from the findings of the present study that there were limited workplace inspections and safety checks were carried out at few study sites. In addition, no written procedures for action to be taken after workplace inspection were found at any of the study sites. It also emerged that all study sites did not conduct any survey to determine the noise levels at work and no control measures were put up to control vibration transmission.

7.2.4 Findings related to occupational accidents in the study sites

It emerged from the findings on the occurrence of occupational accidents during five-year period (April 2011- March 2016) that major accidents were common as they were responsible for nearly three-fifths of accidents. Furthermore, the findings indicated that cuts by machinery were a common source of accidents reported to the Ministry of Labour, Industrial relations and Employment creation.

7.2.5 Findings from document analysis regarding occupational injuries in the Windhoek construction industry

It was revealed from the current study that an overwhelming majority of males aged between 18-29 years were injured in the construction industry and the majority of injured workers was of the Labourer category. Another conclusion drawn from the current study is that the most injured body part was the whole-body followed by fingers.

7.2.6 Findings related to nature of occupational diseases in the construction industry

The current study revealed that there was no documented information regarding occupational diseases from the construction industry during the reviewed period of five years (April 2011 to March 2016).

7.2.7 Findings related to the implementation of an occupational health and safety management system at the study sites

The current study findings indicated that there was a lack of implementation of the OHS management system as a majority of the study sites had no OHS committees, OHS policy, safe working procedures, nor a job risk assessment policy.

In addition, the current study findings indicated that all study sites did not have sickness absence monitoring procedures. The findings also indicated that a majority of the study sites had no induction procedures and did not have a register for periodic safety and health training completed or signed by trained workers nor did the sites carry out induction for new workers.

7.2.8 Findings related to the provision of welfare facilities on study sites

The findings of the study revealed that there were good attempts at achieving OHS compliance on toilet provisions as a majority of the study sites had toilet facilities. However, most of the study site did not have separate toilets for males and females.

Although there was a positive action towards providing rest breaks for workers, as reported by the majority of the participants, it was however, revealed that a majority of the study sites do not have adequate change rooms, rest rooms and hand washing soaps in the toilets. Furthermore, all study sites do not provide smoking designated areas and there were no smoking policies at all study sites.

7.2.9 Findings related to the provision and use of personal protective equipment by construction workers

The study findings revealed the positive steps were taken by employers toward providing workers with correct sized PPE free of charge at the majority of the study sites. However, it was observed during the site inspections that a majority of the participants were not wearing PPE.

7.2.10 Findings related to electrical safety compliance on the study sites

Employers at a majority of the study sites were found to be making a good effort to be OHS compliant towards electrical safety. As a result, they correctly displayed notices prohibiting unauthorised persons from handling or interfering with electric apparatus; ensured plugs, sockets, extension cord and electrical equipment were not defect or damaged; maintained protected and insulated electrical conductors; and ensured that switchboards were closed and locked.

However, the findings also indicated that no portable electrical equipment were safely checked and label attacked for next inspection in all study sites which increased the risk of electrical related accidents.

7.2.11 Findings regarding the safety of work equipment on the study sites

The present study findings revealed a number of good practices on study sites whereby majority of the sites had ladders that were in good condition, machines guarded and user instructions made available for machinery equipment at the majority of study sites. However, the findings also indicated that there a few study sites kept inspection records for work equipment were only found on few.

7.2.12 Findings related to emergency preparedness on the study sites

It was observed that a majority of the study sites have emergency plans, registers of available emergency equipment and locations as well as a list of contacts for ambulance and other services in case of emergency. Nevertheless, the findings of this study showed that there were no safety box minutes at any of the study sites.

7.2.13 Findings related to the availability of first aid services in the study sites

The study concluded that there is lack of certified first aiders, first aid manuals and first aid registers at a majority of study sites.

7.2.14 Findings related to availability of fire safety services in the study sites

It was concluded from the current study that there is a good practice in the majority of study sites regarding fire safety issues such as availability of fire prevention procedures, provision of fire extinguishers and training of workers on fire extinguisher usage. However, much needs to be done as the findings indicated that no fire drills were performed at any study site and no fire warden had been appointed in any study site.

The findings also indicated that a majority of study sites do not have posters informing the workers what to do in case of fire outbreaks and most of the participants were not trained on the usage of fire extinguishers. Furthermore, the current study found out that the fire extinguishers at most of the study sites had expired. It also emerged from the present study that half of the study sites had not kept their emergency escape routes clear and workers at few study sites knew the location of assembly points needed for evacuation procedures.

7.2.15 Findings relating to the availability of documents regarding psychosocial work environment on the study sites

The study findings revealed that a significant majority of the study sites did not have policies, such as stress management policy, policy rewarding workers on OHS promotion, policy preventing harassments at work, HIV anti- stigmatization workplace policy, ethnic group anti-discrimination policy, anti-bullying policy, wellness policy and policy preventing discrimination based on religious background, which promote the psychosocial wellbeing of workers.

7.3 RECOMMENDATIONS

The following recommendations are made on the basis of the findings of the current research:

7.3.1 Recommendations to employers

7.3.1.1 Profile of workers in construction industries

- The employer should ensure that higher numbers of women are hired to work in the construction industry. Women should also be appointed to skilled positions and be treated like their male counterparts without any discrimination. Furthermore, women in the construction industry should be provided with PPE designed for them to avoid non-comfort ability which leads to refusal to wear PPE as most of the PPE is designed for men.
- Employers should also recruit older workers in the organisation in order to guide, supervise and monitor the young inexperienced workers to improve OHS at workplaces.

7.3.1.2 Occupational health and safety awareness of workers

- Employers should ensure that workers are involved in all activities regarding OHS, such as OHS policy development in order to improve their awareness of such practices.
- Employers should allow workers to elect OHS representatives and OHS committees in order for a professional and inclusive coordination of the organisation's OHS aspects.
- Employers should ensure that the OHS policy is developed and implemented in collaboration with workers and OHS representatives.
- Employers should display the OHS policy where workers could access it.
- Tool box meetings and safety talks should be enforced so that construction workers acquire OHS knowledge and awareness.
- OHS training should be conducted periodically to all workers and induction conducted for all new workers.
- Safety signs should be translated in local languages so that even workers who cannot read English get the chances to read and understand it.

7.3.1.3 Effective identification and control of occupational hazards in the construction industry

- Employers should be aware of hazards which workers might be exposed to by conducting a risk assessment that identifies the hazards and controls in order to prevent negative effects that may be caused.
- Employers should use the services of an OHS or occupational hygiene expert in order to monitor the hazard levels at the workplace and act accordingly.
- Employers should ensure that workers are educated on the hazards they are exposed to, their negative effect and ways they can use as preventive measures.

7.3.1.4 Effective preventive measures against occupational accidents in the construction industry

- Employers should ensure that there are safe working procedures at work and workers are informed on the implementation.
- Employers should encourage the conducting of safety checks at work before the starting of any work.
- Workers should be encouraged to prevent accidents by avoiding short cuts and instilling a safety culture in the organisation by engaging if practises such as always using PPE at work.
- Accident reporting should be strengthened.
- All accidents should be investigated and measures be put in place to prevent similar accidents from happening.

7.3.1.5 Effective measures to prevent occupational injuries in the construction industry

- Training should be conducted on injury prevention to make workers aware of how to prevent injuries.
- The employers should ensure injury on duty forms are available and all injuries are reported to the relevant authority.
- The employers should ensure that certified first aiders are available at workplaces in order to provide quality first aid services when necessary.
- The employers should ensure that sickness absence monitoring forms are in place to effectively manage sickness absence and provide support and advice or rehabilitation to workers with long term health problems.

7.3.1.6 Effective measures to prevent occupational diseases in the construction industry

- Employers should ensure that occupational diseases are prevented by monitoring workplaces exposure limits.
- Hazard mitigation, including PPE use and the replacement of manual lifting with mechanical lifting when possible, should be performed.

- Employers should ensure that policies on stress management, anti-bullying and employee wellness, which address the psychosocial wellbeing of workers are developed and implemented.
- Employers should ensure that medical surveillance is conducted at work in order to identify diseases earlier.

7.3.1.7 Adequate measures on employer's compliance towards occupational health and safety in the construction industry

Based on the finding of the current study, the researcher comes up with the recommendations that could assist the employer to promote OHS in the construction industry as highlighted below.

- Employers should ensure that the organisation performs its work in accordance with the statutory legislative requirements of the Labour Act (Act No 11 of 2007), Regulations relating to occupational health and safety of employees at work (No 156 of 1997), National occupational health policy of Namibia (2006), the Social Security Commission of Namibia Act (Act No 34 of 1994), Employees Compensation Amendment Act, 1995 (Act 5 of 1995) and Environmental Management Act, 2007 (Act No 7, 2007).
- Employers should ensure that all critical legislations should be displayed in an accessible place at workplaces for workers to acquaint themselves with OHS requirements and improve their awareness towards OHS.
- Employers should be aware that it is the responsibility of employer to ensure the health and safety of employees at workplaces by identifying hazards at workplaces, assessing hazards, eliminate hazards or minimising/mitigate hazards.
- Employers should ensure that OHS officers, OHS representatives and OHS committees are appointed at workplaces to monitor both OHS on the workplaces and to monitor the working environment, as this reduces occupational accidents, injuries and diseases.
- Employers together with OHS representatives should ensure that an OHS programme is developed at every workplace by developing and implementing a written OHS policy that states the management's commitment towards OHS at work. The policy should include the aims and objectives and strategies that will be

used to achieve the objectives. Furthermore, the policy should be placed within workers' access and be reviewed when necessary.

- Employers should ensure that workers are receiving education and training on OHS at work places. The training should include hazards at workplaces, prevention and control, hazard reporting and the importance of PPE use.
- Employers should ensure that hazardous operations are identified and risk assessment are conducted to prevent occupational accidents, injuries and disease.
- Employers should ensure that occupational hygiene monitoring, such as noise surveys for higher noisy working environment, vibration survey for vibration risk workplaces, environmental monitoring for chemical hazards in order to prevent occupational diseases and accidents, is conducted.
- The employers should ensure that workers at risk of ergonomic hazards are educated on manual moving and handling, and make arrangements not to exceed exposure limit by introducing worker benefits such as workers rest breaks in between activities.
- Employers should conduct pre-employment screening, periodical medical examination and post exit medical examinations in order to assess the health status of their workers.
- Employers should ensure that welfare facilities, such as toilets, changing rooms, rest rooms and smoking designated areas, are provided at work.
- It is also required of the employers to ensure that all portable electrical equipment is checked on a regular basis to ensure that they are not defective and that way prevent electrical accidents and injuries or fire at workplaces.
- Employers should ensure that work equipment at workplaces are maintained and checked to ensure their safety, and prevent accidents and injuries related to the use of machinery.
- Employers should ensure that there exists a designated emergency plan at workplaces, workers are trained on possible emergencies at workplaces and equipped with skills on how to manage possible emergencies.
- Employers should ensure that the trained certified first aiders are available at workplaces and that each workplace should has a first aid manual and a first aid register.

- Employers should ensure that every workplace has a trained fire warden to coordinate fire safety activities, perform fire drills and ensure that the fire extinguishers in functioning order and not expired.
- Employers should ensure that the assembly point is known to all workers for easy evacuation in case of fire.

7.3.2 Recommendation to the government of Namibia

- The government should, in an attempt to improve OHS in the country, ensure that the country ratifies the following ILO conventions:
  - Convention 155 of 1981 (Occupational health and Safety Convention).
  - ILO Convention 167 of 1988 (Safety and Health in construction Convention).
  - Occupational health services Convention, 1985 (No 161).
  - Promotional framework for occupational safety and health Convention 2006 (No 187).
  - Working environment (air pollution, noise and vibration) Convention 1977 (No 148).
  - Chemical convention 1990 (No 170).
- The government's ratification of the aforementioned global conventions legally binds it to apply the conventions on national laws and adopt a preventive safety and health culture at workplaces, thus enhancing the provision of maximum health and safety at work.
- The government should enact a comprehensive construction regulation which includes all OHS aspects in the construction industry.
- The government should seriously address manual moving and handling and workplace ergonomic by developing a standalone regulation so that work-related diseases, such as back pain, can be prevented.
- The shortage of labour inspectorate staff is a concern which leads to the limited staff's failure to conduct workplaces inspections. This could limit the construction site managers' and construction workers' compliance with OHS requirements. The Ministry of Labour, Industrial relations and Employment creation should employ adequate competent OHS inspectors, to inspect construction sites and enforce OHS legislations.

- The Ministry of Health and Social Services in consultation with the Ministry of Labour, Industrial relations and Employment creation should outsource OHS experts to review the National occupational health policy. The reviewed policy should also address both the health and safety components.
- The government should enforce regulation regarding occupational diseases diagnosis, recording and notification.
- The government should set up a law which requires mandatory OHS training to construction workers before any construction work starts so that injuries and fatalities can be prevented.
- Furthermore, the Ministry of Higher Education and Vocational Training should ensure that the OHS module is included in all vocational education courses.
- The government should set up compulsory OHS requirements that must be submitted to responsible offices before building work starts.
- The Ministry of Health and Social services should ensure that occupational health services are decentralised to other regions in the country and more staff are trained so that they can carry out this function.
- The Ministry of Labour, Industrial relations and Employment creation should ensure that the Regulations relating to health and safety of employees at work (No 156 of 1997) is reviewed and made compatible to the technical development and includes some aspects such as dust generation prevention regulations.

7.4 RECOMMENDATIONS FOR FUTURE RESEARCH

The following recommendations for future researches are suggested:

- The practical guidelines to promote OHS in the construction industry in Windhoek, Namibia developed as the primary output of this study should be implemented in the construction industry, so, further research should be conducted to evaluate the progress made regarding construction industry OHS status after the implementation of the practical guidelines.
- Further research should be conducted to assess the OHS situation at the construction sites in other regions of the country.
- Future research must investigate factors contributing to non-compliance to OHS legislations among workers and employers.

7.5 CONTRIBUTIONS OF THE STUDY

The study is the first of this kind to be conducted in the Namibian construction industry.

As a result, it makes a unique contribution to the OHS body of knowledge because practical guidelines are developed and their implementation could improve the OHS situation in the construction's industry. The implementation of the developed practical guidelines contributes towards the OHS in the following:

- The improvement of the construction workers' awareness of OHS.
- Improvement in hazard identification and control in the construction industry in order to mitigate or eliminate hazards.
- Decreasing cases of occupational accidents, injuries and diseases in the construction industry.
- Improving employers' and workers' awareness of OHS regulations by establishing an adherence to national and international OHS legislative frameworks.

Furthermore, an observation of the recommendations means that the OHS legislations and policies will be updated, become comprehensive and meet the technical developmental and International Labour Organisation (ILO) OHS expectations.

7.6 LIMITATION OF THE STUDY

The study was only conducted in Windhoek, Namibia due to the financial constraints. As a result, the views regarding OHS in the construction industry are obtained from construction workers in Windhoek and thus the findings could only be generalized to the construction sites with similar characteristics. However, the current study findings were supported by literatures. Therefore, the findings may be transferred to other setting with similar characteristics. There was a risk of recall bias which was due to self-reported responses from participants. Some participants were observed taking longer to respond to certain questions and the researcher give them chance to think and respond with time. The other challenges encountered by the researcher related to the retrospective record review nature of the study design, and the incomplete, irrelevant and unstandardised records required for the study. There was also a challenge on the calculation of the prevalence rate of occupational accidents, injuries and diseases in the Windhoek construction industry as the number of construction workers in the region is not documented.

Lastly, although all workers in the construction industry of Windhoek were recruited during data collection time, some refuse to participate and this affects the generalisation of the study results.

7.7 CONCLUDING REMARKS

The study provides insight into the OHS situation within the construction industry. The study found out that there is a higher non-compliance with the Regulations relating to the health and safety of employees at work (No 156 of 1997) in the construction industry of Namibia. Occupational health and safety in the construction industry needs to be addressed comprehensively basing on the physical health environment, personal health resources, psychosocial health environment and enterprise community involvement.

The next chapter presents the practical guidelines developed basis of the present study findings, literature review and the theoretical framework in an effort to improve the OHS status in the construction industry.

CHAPTER 8

PRACTICAL GUIDELINES FOR THE PROMOTION OF OCCUPATIONAL HEALTH AND SAFETY IN THE CONSTRUCTION INDUSTRY IN WINDHOEK, NAMIBIA

8.1 INTRODUCTION

This chapter outlines the practical guidelines developed to promote occupational health and safety (OHS) in the construction industry in Windhoek, Namibia. The guidelinedesign draws on the reviewed relevant literature, theoretical framework used to support the study and the study's main findings. The developed guidelines are in line with the Ministry of Labour, Industrial relations and Employment creation's expectations as the custodian for labour legislations in Namibia.

8.2 THE PURPOSE OF THE GUIDELINES

The purpose of the developed guidelines is to serve as a tool to promote healthy and safe physical and psychosocial work environments in Namibia's construction industries and to safeguard the health and safety of workers in the construction sector by preventing and controlling the occurrence of occupational hazards and related risks emanating from these various work environments.

8.3 THE SCOPE AND OBJECTIVES OF THE GUIDELINES

8.3.1 Scope of the guidelines

The proposed guidelines are applicable to all workers in the construction industry. These workers are targeted because they work in an environment that has different occupational hazards which make them at risk of occupational injuries, accidents and diseases. Furthermore, the government will also be able to use this guideline to monitor or enforce the OHS legislative requirements.

8.3.2 Objectives of the guidelines

The objectives of the developed guidelines are to:

- Equip construction workers and employers with knowledge and skills regarding OHS awareness in the construction industry.
- Outline common hazards faced by the workers and employers in the construction industry and suggest ways on how to prevent or mitigate them.
- Empower the construction workers and employers with the knowledge of occupational accidents and injuries and that on how to prevent them.
- Conscientise the construction workers and employers with the nature of occupational diseases and how to prevent them.
- Underline the importance of worker and employer compliance to OHS national and international legislations.

8.3.3 Benefits of the practical guidelines

The developed practical guidelines will improve the overall OHS knowledge and skills, make the employers aware of the working environment and promote OHS as well as improve the wellbeing of workers in the construction industry. It is envisaged that the developed guidelines will lead to the reduction of occupational accidents, injuries and disease among workers, and improve the country’s economy and its reputation towards the OHS status of the construction industry. Furthermore, the practical guidelines will improve the status of different categories of stakeholders in a different way as shown below:

8.3.3.1 End-users (employers)

The employers will be knowledgeable of and competent with OHS development and management in the organisation. The employers would be able to improve OHS at the construction sites by allocating enough resources towards OHS promotion. Furthermore, employers will be able to identify, assess, and control hazards and thus limit any likely negative effects to workers and the work environment. The employers will also involve workers in all OHS planning through OHS representatives, and monitor OHS through continuous improvement processes. Therefore, the practical guidelines will assist the construction industry's employers to comply with the national and international OHS legislative frameworks.

8.3.3.2 End-users (workers)

Workers would be involved in decision makings and in all activities pertaining to OHS. The worker's activities include appointing their own OHS representatives, which makes confident to report hazardous conditions. Workers would also be trained on OHS, be able to identify hazards, and prevent occupational accidents, injuries and diseases.

8.3.3.3 The society

Knowledgeable and competent construction workers and employers would always practice workplace safety and health; reduce accidents, injuries and occupational diseases; and engage in other activities such as pollution control which prevent the harming of the environment or the people around the construction sites. This would, therefore, lead to quality health and safety outcomes.

8.4 THE PROCESS OF DEVELOPING PRACTICAL GUIDELINES

This section discusses the steps that were undertaken in the development of the guidelines for the promotion of OHS in the construction industry and the process followed in the practical guideline development.

The researcher used the findings from the literature review presented in chapter 2, the WHO healthy workplace model which is the theoretical framework that underpins the current study as presented in chapter 3, and key study findings described in chapter 6 to formulate the practical guidelines that promote OHS in the construction industry. Figure 8.1, below, illustrates the systematic process followed in the development of the practical guidelines.

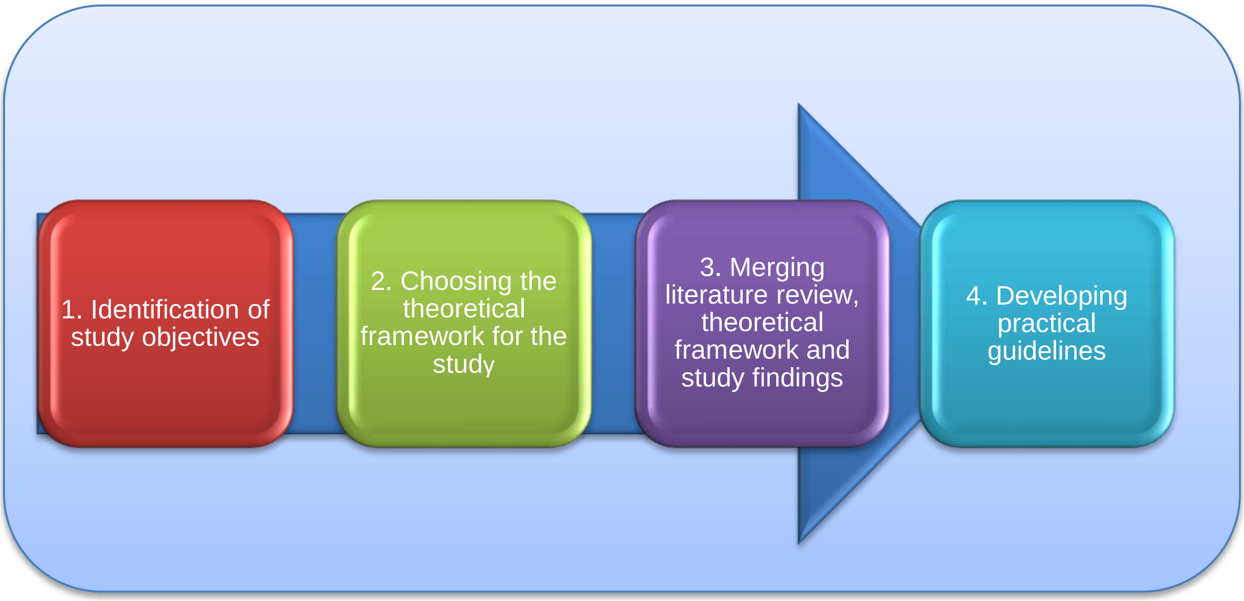


Figure 8.1 Presentation of the guidelines development process

8.5 APPLICATION OF THE WORLD HEALTH ORGANIZATION HEALTHY WORKPLACE MODEL TO THE DEVELOPMENT OF THE GUIDELINES

The main focus of the WHO healthy workplace model is to encourage the employers to promote the OHS of workers at workplaces through a comprehensive approach to the physical work environment, personal health factors, psychosocial work environment and enterprise community involvement (WHO 2010:12). Furthermore, management commitment, workers' involvement and continuous improvement process should be considered in order to promote healthy workplaces (WHO2010:25).

8.6 OUTLINE OF THE PRACTICAL GUIDELINE

As shown in Figure 8.1, the process followed in the development of the practical guidelines to promote OHS in the construction industry is illustrated. There are seven components which must be addressed in order to promote OHS in the construction industry. The organisation management and workers addressing of all seven components would enable the organisation to successfully promote OHS and attain zero workplace accidents, diseases, injuries and fatalities, which leads to higher productivity and a good reputation. Furthermore, the overall workers' healthy and safe would be maintained, which also boosts the workers' morale and job satisfaction. Table 8.1 presents the guidelines developed to promote OHS in the construction industry of Windhoek, Namibia.

In addition, figure 8.2 illustrates the practical guidelines developed to promote the OHS in the construction industry of Windhoek, Namibia.

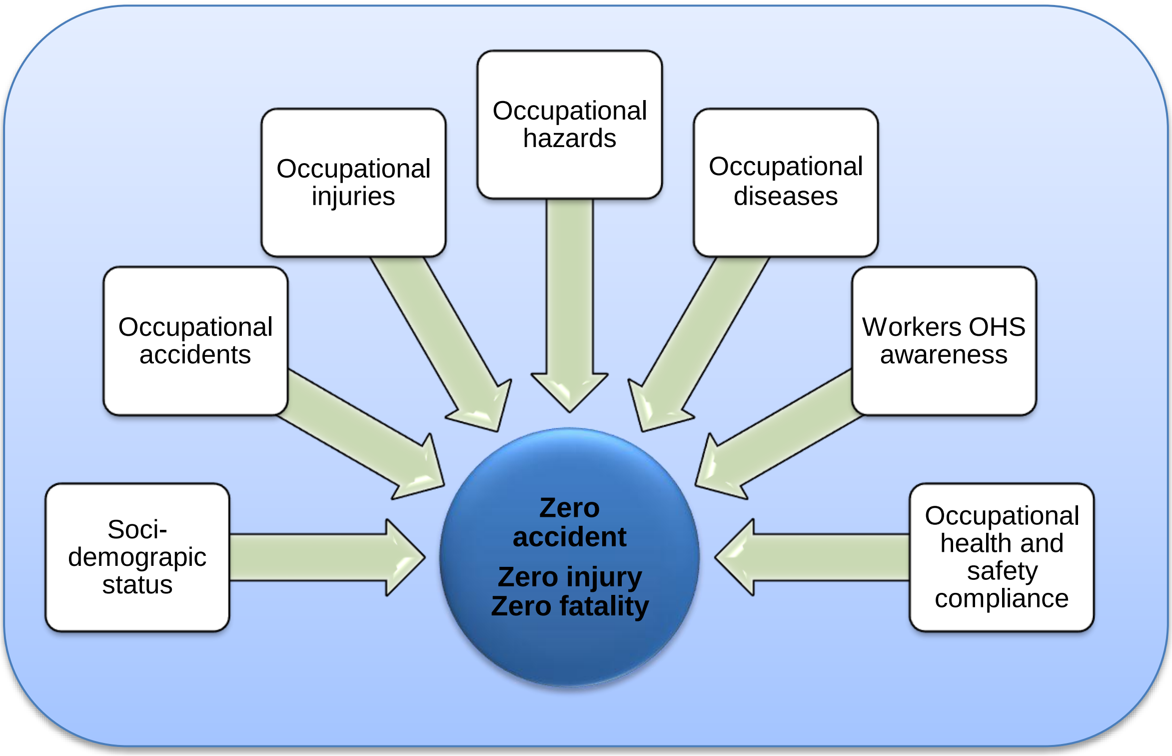


Figure 8.2 An illustrative figure of the guidelines developed to promote OHS in the construction industry, in Windhoek, Namibia

Table 8.1 Guidelines for the promotion of occupational health and safety in the construction industry in Namibia

Key challenges facing the construction industry in Namibia	Current study findings	Purpose of the guideline	Relevant component of the WHO healthy workplace model	Recommended guideline
1 Socio-demographic characteristics of construction workers	1 The female workers at the study sites were limited, which possibly causes the non-addressing of OHS such as PPE provision.	1 Affirmative recruitment of construction workers **Aim** To give equal rights to females seeking to enter the construction job market.	1 Personal health resources	• Employment of more female workers in the construction industry. • Address the female workers OHS needs such as the risk assessment of PPE to prevent ill-fitting PPE which may expose female workers to hazards.
	2 Most workers in the study sites were young workers, who lack OHS experience and had poor perceptions on accidents and injuries.	1 Proper selection of workers to include all age groups **Aim** To get the representation of all age groups for success of the mentoring programme at workplaces.	1 Personal health resources	• Employment of workers for all age categories. • Development and implementation of mandatory induction and mandatory periodic training for young workers. • Implementation of a programme where older workers mentor young workers. • Strengthening of the supervisory skill at workplaces.
2 Awareness of OHS aspects at workplaces	1 Lack of awareness of occupational health and safety aspects and standards among workers.	1 Provision of OHS education and training	1 Physical work environment	• Conducting OHS induction training to all new workers. • Conducting OHS periodic training for all workers. • Conducting job and task training for all workers and apply practical components such as demonstrations when necessary. • Training all supervisors about their OHS responsibilities, legal frameworks, accident prevention, accident investigation procedures and safety inspections in order for them to guide workers. • Training OHS representatives, OHS officers and OHS committees on

Key challenges facing the construction industry in Namibia	Current study findings	Purpose of the guideline	Relevant component of the WHO healthy workplace model	Recommended guideline
				OHS aspects, especially hazards identification, accident reporting, safety checks and workplaces inspections. • Keeping the signed list of workers who would have undergone training. • Identifying the training needs during supervision and inspections.
		2 Conduct toolbox safety talks before commencing work daily. **Aim** To improve OHS awareness and strengthen a safety culture in the organisation.	1 Physical work environment	• Ensuring that tool box safety meetings are compulsory for all workers. • Involvement of OHS representatives in safety talks. • Sharing information on recorded accident and miss hap occurrences and providing information on the prevention of such occurrences.
3 **Occupational hazards at the construction sites**	1 Physical, chemical, ergonomic and psychosocial hazards were present at all study sites.	1 Conduct risk assessment to identify, assess, control and prevent or mitigate hazards. **Aim** To identify hazards and to put up measure to prevent accidents and injuries.	1 Physical work environment 2 Personal health resources 3 Psychosocial work environment	• Identification of all hazards at workplaces. • Conducting equipment noise emission surveys and act accordingly. • Conducting personal noise sampling and act accordingly. • Assessment of the hazards. • Evaluation of the risk and developing precautionary measures. • Implementing measures to mitigate hazards. • Communicating the risk assessment findings.
		2 Conduct surveys to determine the hazard levels at workplaces. **Aim**	1 Physical work environment	• Conducting noise surveys and act accordingly. • Conducting vibration exposure surveys and act accordingly.

Key challenges facing the construction industry in Namibia	Current study findings	Purpose of the guideline	Relevant component of the WHO healthy workplace model	Recommended guideline
		To determine the exposure limit of different occupational hazards.		• Determining the noise levels at workplaces and act accordingly. • Conducting surveys to gather data from workers regarding psychosocial hazards and put up measures based on the outcomes.
		3 Educate and train workers on the hazards they are exposed of and how to prevent occupational accidents, diseases and fatalities arising from hazard exposure. **Aim** To equip the workers with hazard awareness and prevention.		• Adjusting the working environment accordingly to prevent hazard exposure. • Replacing manual work with mechanical works if possible. • Educating workers on hazard prevention. • Training workers on risk assessment. • Strengthening the hazard reporting procedures. • Investigating all reported hazards and act accordingly.
	2 Most workers did not wear personal protective equipment (PPE).	1 Provide suitable PPE free of charge, replace defective ones and train workers on the effective usage of PPE. **Aim** To protect workers against hazards.	1 Personal health resources	• Conducting risk assessment to determine PPE required for each job. • Provision of PPE free of charge. • Educating workers on PPE usage and maintenance. • Replacing damaged PPE. • Training workers on PPE inspection. • Enforcing the mandatory use of PPE.
4 Occupational accidents at the construction sites	1 Several accidents were reported from the construction industry.	1 Provide training on workplaces accident prevention. **Aim** **T**o make workers aware of accident prevention.	1 Physical work environment 2 Personal health resources	• Training workers on different possible accidents in the construction industry. • Educating workers on accident prevention. • Training workers on accidents reporting.

Key challenges facing the construction industry in Namibia	Current study findings	Purpose of the guideline	Relevant component of the WHO healthy workplace model	Recommended guideline
	2 Many workers did not attend OHS training.	2 Provide OHS training to all workers on a regular basis. **Aim** To equip the workers with OHS knowledge which contributes to accident prevention.	1 Personal health resources	• Identifying the training needs with the assistance of workers, OHS officers and OHS representatives. • Conducting OHS training periodically. • Assessing the effectiveness of the training. • Keeping the signed register for workers who would have attended the training.
	3 Lack of safe working procedures in study sites.	1 Develop safe work methods at workplaces. . **Aim** To prevent exposure to hazards and the occurrence of occupational accidents, injuries and diseases.	1 Physical work environment 2 Personal health resources	• Developing safe working procedures at workplaces. • Conducting safety checks before any work starts. • Educating workers on their responsibility towards their own health and safety and those around them. • Displaying safety signs at workplaces and ensuring that they are translated into local languages. • Developing a rewarding system for workers adhering to OHS. • Conducting workplace inspections and act accordingly. • Developing a standardised inspection checklist for workplace inspection. • Recording and reporting accidents and incidents to the relevant authorities. • Conducting a continuous monitoring process in order to prevent accidents.

Key challenges facing the construction industry in Namibia	Current study findings	Purpose of the guideline	Relevant component of the WHO healthy workplace model	Recommended guideline
	4 Lack of induction for new workers at study sites.	2 Induct all new workers. **Aim** To increase workers' awareness and knowledge of inherent workplace hazards and prevent the occurrence of workplace accidents, injuries and diseases.	1 Personal health resources	• Using induction modules from an approved and competent organisation. • Including all OHS aspects in the induction. • Developing and implementing safe working procedures at workplaces.
5 Occupational injuries in the construction industry	1 Many injuries were reported from the construction industry.	1 Prevent the occurrence of workplace injuries in cases of emergencies. **Aim** To increase the workers' awareness of workplace injuries and prevention in order to maintain workers wellbeing.	1 Physical work environment 2 Personal health resources	• Recording all occupational injuries in the injury register. • Reporting any occupational injury to the relevant authority.
	2 Most construction sites did not have emergency plans in place.	2 Plan for emergencies at workplaces. **Aim** To prevent disasters.	1 Physical work environment	• Developing an emergency plan at workplaces. • Displaying emergency contact details e.g. ambulance, hospital. • Developing procedures on how to transport injured workers to the hospital during emergencies. • Keeping the emergency exit clear and making it known by all workers. • Appointing fire wardens who will coordinate evacuation in case of fire.
	3 Many study sites had no certified first aiders.	3 Provide first aid services at workplaces.	1 Personal health resources	• Appointing certified first aiderswho would be present at workplaces all times. • Displaying the names of certified first aiders so that they are known by all workers.

Key challenges facing the construction industry in Namibia	Current study findings	Purpose of the guideline	Relevant component of the WHO healthy workplace model	Recommended guideline
		Aim To provide first aid services when necessary.		• Making the location of first aid kits known by all workers. • Keeping the first aid register at first aid station for the recording of first aid cases. • Displaying the first aid manual at the first aid post for references.
6 Occupational diseases in the construction industry	1 Lack of records of occupational diseases and related medical reports at most study sites.	1 Provide medical surveillance at workplaces. **Aim** To maintain and monitor the health status of workers.	1 Physical work environment 2 Personal health resources 3 Psychosocial work environment	• Conducting pre-employment screening, periodic medical examination and employment exit medical examination to identify diseases timely. • Appointment of occupational health nurse/practitioner or arrange for. • Periodic visits by a health professional.
	2 No evidence of reported occupational disease from the construction industry for a period of five years possibly due to lack of reporting systems or enforcement.	2 Develop a recording and reporting system for occupational diseases. **Aim** To keep statistical processes that can be used for planning and interventions.	1 Physical work environment 2 Psychosocial work environment	• Recording and reporting diagnosed occupational diseases to the relevant authority. • Recording and reporting all diagnosed occupational diseases.
	3 Lack of evidence of sickness absence monitoring procedures at all study sites.	3 Monitor sickness absence at workplaces. **Aim** To support workers in need of rehabilitation or with return to work strategies.	1 Personal health resources 2 Psychosocial work environment	• Developing and implementing sickness absence procedures. • Development strategies for return to work. • Planning for the rehabilitation of sick workers. • Monitoring and supporting workers with chronic conditions.
7 Compliance towards OHS provision and practices in the construction industry	1 Many study sites were found without relevant OHS documents such as the OHS policy, Labour	1 Display and implement OHS documents and legislations at the workplaces.	1 Physical work environment	• Displaying all documents related to the OHS policy, Labour Act (Act 11 of 2007, Regulations relating to the

Key challenges facing the construction industry in Namibia	Current study findings	Purpose of the guideline	Relevant component of the WHO healthy workplace model	Recommended guideline
	Act (Act 11 of 2007, Regulations relating to the health and safety of employees at work (No 156 of 1997) and the National occupational health policy.	**Aim** To ensure OHS legal compliance to promote OHS at the construction sites.	2 Psychosocial work environment 3 Personal health resources 4 Enterprise community involvement	health and safety of employees at work (No 156 of 1997) and the National occupational health policy within workers access. • Adapting all OHS legislative requirements at the workplace. • Encouraging workers to read OHS documents to enhance their knowledge and skills. • Developing an OHS policy in the organisation which states the organisation's commitment towards workers health and safety. • Providing the construction workers with knowledge on legislative requirements regarding OHS. • Developing and maintaining OHS s at workplaces in cooperation with workers and workers' representatives.
	2 Many construction sites had no OHS representatives	2 Workers should elect OHS representatives at each workplace. **Aim** To involve workers in decision making which shows workers' involvement.	1 Physical work environment	• Applying continuous improvement processes from the initiation to the evaluation of the OHS at the construction sites.
	3 Many study sites had no OHS committee meetings.	3 Nominate an OHS committee and encourage meetings to address OHS aspects at workplaces. **Aim** To facilitate OHS at workplaces.	2 Personal health resources	• Involving workers in the election of OHS representatives. • Orientating OHS representatives about their responsibility towards OHS. • Involving OHS representatives in all OHS activities. • Encouraging workers to nominate OHS committee members.

Key challenges facing the construction industry in Namibia	Current study findings	Purpose of the guideline	Relevant component of the WHO healthy workplace model	Recommended guideline
				• Training the OHS committee on how to maintain their OHS functions.
	4 Lack of policies regarding psychosocial workplace improvement at all study sites.	. Develop policies which influencethe psychosocial wellbeing of workers at workplaces. **Aim** To prevent OHS challenges related to the psychosocial wellbeing at workplaces.	1 Psychosocial work environment	• Developing and implementing policies that address the psychosocial work environmental aspects such as stress, harassment, bullying, and stigmatization on the basis of ethnicity or religion.
	5 Lack of corporal responsibility towards the surrounding communities.	Develop strategies, such as donations and funding that may assist the surrounding community. **Aim** To collaborate with the community. 2. Develop policies that prevent a negative environmental impact. **Aim** To prevent environmental degradation and pollution which may also negatively affect the community.		• Initiating strategies that assist the community. • Involving the community leaders in the identification of the needs. • Evaluating and monitoring the initiated strategies . • Training the community on sustainability of the community program. • Developing and implementing waste management policy. • Training workers on waste management and pollution control.

8.7 RECOMMENDATIONS FOR THE IMPLEMENTATION OF THE DEVELOPED PRACTICAL GUIDELINES

The researcher will approach the managers at the five construction sites in Windhoek, Namibia in order to obtain permission to pilot test the implementation of the guidelines. The guidelines will be presented to the employers and construction workers during the piloting. In addition, the piloting will be conducted within one year of the guidelines' development to validate and refine them before their implementation in the construction industry.

Adjustments to guidelines will be performed on the basis of the pilot testing outcome. The researcher will contact the Ministry of Labour, Industrial relations and Employment creation, Ministry of health and Social Services and other stakeholders in order to gain their support in the launching and adopting the guidelines in the construction industry.

The researcher will also ensure that employers are applying the following aspects during the implementation of the practical guidelines, which are aimed at supporting the construction workers and employers in promoting occupational health and safety in the construction industry:

- Include construction workers in the planning of the implementation of practical guidelines.
- Ensure that the guidelines are within worker's access so that they can read them any time.
- Conduct meetings regarding the implementation and respect of workers views.

8.8 RECOMMENDATIONS FOR THE EVALUATION OF THE DEVELOPED GUIDELINES

A continuous evaluation process will be conducted to assess the effectiveness of the developed guidelines. The researcher will set up a measurement indicators tool with a criterion to evaluate the guidelines after the pilot testing of the guidelines. Thereafter, the researcher will conduct the evaluation process at different construction sites six months after the implementation of the guidelines. The researcher will visit the construction sites with the evaluation tool to assess the application and implementation of the guidelines.

8.9 IMPLICATIONS FOR THE CONSTRUCTION INDUSTRIES IN NAMIBIA

It is envisaged that construction site managers and the OHS representatives should make themselves aware of the recommendations of the guidelines in order for them to be able to facilitate their implementation in an effective way. In addition, the management of construction sites needs to affirm their commitment by allocating a budget for the OHS improvement. The construction sites' management and OHS representatives should also conduct continuous monitoring processes to assess the implementation of the guidelines. Finally, employers should ensure that workers are included in all decision making as this results in an effective implementation of the guidelines.

An implementation of the guidelines will enhance the construction industry's OH Sand result in the reduction of occupational accidents, injuries and diseases and the improvement of workers' awareness of OHS in the construction industry. Moreover, the construction industry's management's commitment towards OHS will lead to further investments in the OHS through the trainings and safety talks and by ensuring construction sites' compliance with OHS.

8.10 IMPLICATIONS FOR THE GOVERNMENT

It is envisaged that the developed guidelines will assist the Ministry of Labour, Industrial relations and Employment creation in the application of the OHS requirements specific to the construction industry. The government's application of the practical guidelines will also result in the setting up of a system to report and record all occupational accidents, injuries and diseases, as well monitor the construction sites' compliance with recording and reporting.

The guidelines will also assist the government in enforcing medical surveillance and reporting systems for occupational diseases. The lack of recorded occupational disease identified from the study findings implies that the magnitude of occupational diseases in the Windhoek construction industry is unknown, which affects the construction workers' quality of life. Furthermore, lack of reports on workplace accidents and injuries on duty and that of accident registers, is indicative of a poor recording and reporting system in the construction industry which leads to too many missed opportunities. It is envisaged that an implementation of the guidelines enables the government to enforce the reporting and recording which will lead to the construction industry's compliance with OHS.

8.11 DISSEMINATION OF DEVELOPED GUIDELINES

It is envisaged that the proposed guidelines will be disseminated to stakeholders and end-users such as construction site managers, construction workers, the Ministry of Labour, Industrial relations and Employment creation, the Ministry of Health and Social Services, workers' trade unions and interested community members. The dissemination will be conducted through seminars, workshops, conferences, meetings and publications in occupational health and safety-related journals. The hard copies of the report containing these guidelines will be accessible through the UNISA library, and the library website will contain a soft copy of the research report that contains these guidelines.

8.12 CONCLUSION

The chapter outlined the process leading to development of the practical guideline which will promote OHS in the construction industry. It is noted here that an implementation of the guidelines, especially those focusing on the adoption of measures that prevent risks and limit occupational challenges, plays an important role in improving the construction industry's compliance with OHS legislations. The guidelines are considered as likely to assist organisations in the development of individualized policies seeking to achieve the physical and psychosocial wellbeing and safety of workers in the construction industry.

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ANNEXURES

ANNEXURE A

APPROVAL FROM UNISA RESEARCH AND ETHICS COMMITTEE

UNISA university of south africa

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

HSHDC/263/2013

Date:	27 November 2013	Student No:	5316-223-4
Project Title:	Framework for promoting occupational health and safety among workers in the construction industry in Windhoek, Namibia.		
Researcher:	Ms Emma Maano Nghitanwa		
Degree:	D Litt et Phil	Code:	DPCHS04

Supervisor: Prof L Zungu
Qualification: PhD
Joint Supervisor: -

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

UNIVERSITEIT VAN SUID-AFRIKA
PRETORIA
UNIVERSITY OF SOUTH AFRICA

ANNEXURE B

MINISTRY OF HEALTH AND SOCIAL SERVICES APPROVAL

REPUBLIC OF NAMIBIA

Ministry of Health and Social Services

Private Bag 13198
Windhoek
Namibia

Ministerial Building
Harvey Street
Windhoek

Tel: 061 – 203 2560
Fax: 061 – 222558
E-mail: tkakili@gmail.com

OFFICE OF THE PERMANENT SECRETARY

Ref: 17/3/3
Enquiries: Ms .T. Kakili

Date: 26 June 2014

Ms. Emma Nghitanwa
P.O. Box 63235
Wanaheda

Dear Ms Nghitanwa

Re: Request for permission to access data for your literature review section in your dissertation towards a PHD in Health studies.

1. The ministry of Health and Social Services hereby acknowledge receipt of your request stated above.

2. **Kindly be informed that permission for your request to access data has been granted under the following conditions:**

2.1 The data to be collected must only be used for the completion of your literature review chapter;
2.2 No other data should be collected other than the data stated in the request letter;
2.3 Separate permission should be sought from the Ministry for any other data collection
3.4 Findings should be submitted to the Ministry upon completion of your study.

PERMANENT SECRETARY
JUL 2014
MINISTRY OF HEALTH AND SOCIAL SERVICES

Andrew Ndishishi (Mr)
Permanent Secretary

"Health for All"

ANNEXURE C

MINISTRY OF LABOUR AND SOCIAL WELFARE APPROVAL

REPUBLIC OF NAMIBIA

MINISTRY OF LABOUR AND SOCIAL WELFARE

Tel: (061) 206 9111
Fax: (061) 212 323 / 252 462
Enquiries: Ms A. Munkawa
Our Ref: .... Your Ref: ....

Private bag 19005
32 Mercedes Street
Khomasdal
WINDHOEK, Namibia

29 August 2013

The Researcher
P. Box 63235
KATUTURA

Att: Ms Emma Maano Nghitanwa

Dear Ms. Nghitanwa

RE: REQUEST FOR OCCUPATIONAL HEALTH AND SAFETY DOCUMENTATION (ANNUAL REPORTS, LEGISLATIONS AND CURRENT GUIDELINES) FOR STUDY PURPOSE

1. Your letter dated the ***10th of August 2013*** on the above subject matter, has reference.

2. Kindly please be informed that your request for permission to obtain the aforementioned documentation for the Windhoek area has been granted, ***provided that this information will be kept confidential and will only be used for research purposes as indicated in your letter.***

3. Therefore, in order for you to obtain this documentation, you are hereby advice to contact the Deputy Director: Occupational Health and Safety, Ms. Penny Munkawa, at the Headquarters of the Ministry, situated at ***32 Mercedes Street, Khomasdal, Windhoek.***

All official correspondence must be addressed to the Permanent Secretary

4. Furthermore, please bear in mind as well that the Ministry as the statutory custodian responsible for protecting workers against hazardous conditions at workplaces will always support any endeavors that will directly or indirectly contribute to the reduction of occupational accidents for the benefit of all people in Namibia.

Thanking you in advance for your, unwavering support to promote Safety and Health in Namibia.

Looking forward to your kind cooperation

Yours Sincerely

George Simataa
PERMANENT SECRETARY

MINISTRY OF LABOUR AND SOCIAL WELFARE
PERMANENT SECRETARY
REPUBLIC OF NAMIBIA

ANNEXURE D

APPROVAL FROM KHOMAS REGIONAL COUNCIL

KHOMAS REGIONAL COUNCIL

Tel: +264 61 218625
Fax: +264 61 218638
Omuvapu Street: Erf 2305

Khomas Regional Council
P.O. Box 3379
Windhoek

05 June 2014

OFFICE OF THE CHAIRPERSON

Dear Ms Nghitanwa

Your letter dated the 29th May 2014 is acknowledged on permission to conduct research in the construction industry in Windhoek. Kindly please be informed that permission is granted to conduct research in Windhoek, Khomas Region.

Therefore, in order for you to obtain required information you are hereby advised to contact site managers (contractors) for all construction sites in Windhoek, Namibia.
Please ensure the contractors are informed that all information will be treated with confidentiality and no names will be revealed.

We are happy to support the idea of promoting occupational health and safety in the construction industry and improving quality of life of construction workers in Namibia.

Thanking you for promoting occupation health and safety.

Yours Sincerely

Hon. Zulu Shitongeni
Chairperson-Khomas Regional Council

Khomas Regional Council
P.O. Box 3379
Windhoek
05 -06- 2014
Office of the Chairperson

ANNEXURE E

LETTER TO SITE MANAGERS CONSENT – CONSTRUCTION SITE MANAGERS REQUESTING PERMISSION TO CONDUCT A RESEARCH

PO Box 63235
Katutura
Windhoek
Namibia
07 September 2014

The Site Manager
Construction Site
Windhoek
Namibia

Dear Sir/Madam

Request for permission to conduct a research study on the construction industry in Windhoek

I am studying towards my degree of Doctor in Philosophy and Literature in Health Studies at the University of South Africa. It is the requirement to conduct research, with the title of the study being: *Development of practical guidelines to promote occupational health and safety for workers in the construction industry of Windhoek, Namibia*. The aim of this research is to promote the occupational health and safety in the construction industry by developing practical guidelines that address and improve occupational health and safety in the industry in Windhoek. The study population will be workers in the construction industry in Windhoek.

I thus request permission to undertake the research at your construction site. The date for data collection will be agreed with you. All information will be treated with confidentiality and for academic purposes and vouch that no reference or identification of participants will be made in the event of the publication of the study.

Your assistance with the provision of a letter of permission to conduct the study is appreciated. Please contact me on +2648 1664 8436 for any further information.

Yours faithfully

Signature

Emma Maano Nghitanwa (Researcher)

ANNEXURE F
INFORMED CONSENT FOR CONSTRUCTION WORKERS

INFORMED CONSENT FOR WORKERS IN THE CONSTRUCTION SITES

Study title: **Development of practical guidelines to promote occupational health and safety for workers in the construction industry of Windhoek, Namibia.**

My name is Emma Maano Nghitanwa. I am currently studying for a Degree of Doctor of Literature and Philosophy in Health Studies at the University of South Africa. One of the requirements for this degree is to conduct a research. The aim of this research is to develop practical guidelines to promote occupational health and safety of workers in the construction industry. The study objectives are to gather information regarding occupational safety and health in the construction industry such as the socio-demographic profiles of workers, occupational health and safety hazards, workers awareness on occupational health and safety, occupational accidents, injuries and diseases among workers in the construction industry of Windhoek in Namibia. Furthermore, the study will investigate the occupational health and safety legislative provisions and compliance among construction sites.

Practical guidelines will be developed based on the study findings to assist in promoting occupational safety and health for workers in the construction industry. I thus request your consent to participate in the study. Your participation is voluntary and you may withdraw from the study at any time during the study. You may ask questions and can refuse to answer any question. All information will be treated with confidentiality.

Thank you
Emma Maano Nghitanwa (Researcher)
Signature of researcher …………………………………………
Date ……………………..
I agree to participate in this study (please tick relevant) Yes No
Signature of participants…………………………………………………………………..
Date ……………………………………………………………………………………
Code of the construction site ……………………………………………………

TRANSLATED INFORMED CONSENT TO *OSHIWAMBO*

OMUKANDA WOVANAILONGA VOMATUNGO WEPITIKO LEKUFOMBINGA MOMAPEKAAPEKO

Oshipalanyole shomapekaapeko:**Enduluko lomifindalandu dexwaxwameko loundjolowele neameno moilonga yomatungo moVenduka, mo Namibia.**

Edina lange aame Emma Maano Nghitanwa. Ondili omwiilongi wonghatu yopombada youndokotola moipambele youndjolowele moshiputudilo shopombada sha South Africa. Elilongo eli otalipula opo ndininge omapekaapeko. Elalakano lomapekaapeko okunduluka omifindalandu dokuxwaxwameka oundjolowele neameno moilonga yomatungo. Omapeekaapeko otaaka ongela omauyelele enasha a noundjolowele neameno moilonga yomatungo ngaashi oukwatya wopaunhu nopanghalafano wovanailonga momatungo, oikumhungu oyo taidulu okweetifa oiponga, eshiivo lovanailonga vomatungo moundjolowele neameno moilonga yomatungo, oiponga, omauyehame molwa oiponga, nomauvela movanailonga vomatungo mo Venduka mo Namibia. Natango tuu, omapeekapeko otaakatala nghene eeveta doundjolowele neameno lovanailonga haliyandjwa nohali wanifwapo meenhele domatungo. Lwaxuuninwa, omilandufinda otadikatotwa opo dikwafele okunawapeka onghalo youndjolowele neameno wovanailonga vomatungo.

Ekufombinga loye otali pandulwa nolili paliyambo, noto dulu okuninguluka efimbo keshe wahala. Oto dulu upule omapulo ile okwaanya okunyamukula epulo inohala kulinyamukula. Ouyelele aushe toyandye otau kwatwa nawa, noitaukahololelwa ovanhu umonike kutya oove wanyamukula ngaho.

Oto dulu mbela ukwafenge unyamukule omapulo taalandula?
Tangi unene
Emma MaanoNghitanwa (Omupekaapeki)
Eshaino ………………………………………… Efiku …………………………….
Ondaitavela ndikufe ombinga momapekaapeko (yandja okangobe) Eheno   Ahawe
Esaino lomukufimbinga………………………………………………………………………
Efiku ……………………………………………………………………………………..
Onomola yonhele yomatungo ………………………………………………………

ANNEXURE G
QUESTIONNAIRE

QUESTIONNAIRE NUMBER

Section 1: Personal health resources

1.1Socio- demographical data

Please tick what applies   For office use only

1.1.1 Gender	Male 1 Female 2	
1.1.2 Age (in years) Please specify		
1.1.3 Marital status	Single 1 Married 2 Divorced 3 Widow /er 4 Separated 4 Cohabitating 6	
1.1.4 Level of education	Tertiary 1 Secondary 2 Primary 3 None 4	
1.1.5 Type of work in the construction industry	Bricklayer 1 Painter 2 Electrician 3 Plumber 4	

		Engineer | 5 Carpenter | 6 Driver | 7 Labourer | 8 Other | 9	
1.1.6 Employment type		Permanent | 1 Fixed contract | 2 Casual | 3	

Section 2: Awareness of occupational and health and safety (OHS) existence

2.1 Occupational health and safety provision awareness

2.1.1 Are there Occupational health and safety documents e. G. OHS policy, OHS procedure you aware of in your work place?	Yes | 1 No | 2	
2.1.2 Are OHS documents, e. G policies, placed for easy access to workers?	Yes | 1 No | 2	
2.1.3 Did you receive OHS training during this construction project?	Yes | 1 No | 2	
2.1.4 Do you know the health and safety representative/s at your workplace?	Yes | 1 No | 2	
2.1.5 Do you know health and safety	Yes | 1 No | 2	

officer/s at your workplace?		
2.1.6 Have you ever attended safety workshops at your workplace?	Yes 1 No 2	
2.1.7 Do you know what to do in case of accidents at your workplace?	Yes 1 No 2	

2.2 Awareness of workplace emergencies preparedness and first aid service provision at the construction sites

2.2.1 Have you ever received training regarding possible emergencies at work?	Yes 1 No 2	
2.2.2 Do you have plans regarding cases of emergency at your workplace?	Yes 1 No 2	
2.2.3 Do you know the First aider/ s at your workplace?	Yes 1 No 2	
2.2.4 Do you know where First aid kits are located at your workplace?	Yes 1 No 2	

2.3 Awareness of hazard reporting and control

2.3.1 Do you know where to report identified OHS hazards?	Yes 1 No 2	

2.3.2 Are you aware of any hazard control that is performed at your workplace?	Yes 1 No 2	

Section 3: Occupational hazards at the construction sites

3.1 Presence of occupational hazards at the construction sites

3.1.1 Are the following hazards present at your workplace? **3.1.1.1Physical hazards:** a) Noise b) Dust c) Vibration	Yes No 1 2 1 2 1 2	
3.1.1.2 Chemical hazards e. G. paints	Yes No 1 2	
3.1.1.3 Psychosocial hazards: a) Discrimination b) Victimization	Yes No 1 2 1 2	

Section 4: Occupational accidents at the construction sites

4.1 Have the following accidents ever happened on this construction site:

	Yes	No	
a) Falls from above	1	2	
b)Electrocution	1	2	
c)Struck by moving vehicle	1	2	
d)Cut by machinery	1	2	
e)Struck by falling objects	1	2	
f)Motor vehicle crashes	1	2	
g)Trench burying	1	2	

Section 5: Self reported health problems

5.1 Have you ever experienced the following health problems during the past 6 months:

	Yes	**No**	
a) Back pain			
b) Breathing difficulties			
c) Skin problems			
d) Hearing difficulties			

Section 6: Occupational health and safety provision in the construction site

6.1 Provision of welfare facilities in the construction sites

6.1.1 Do you have access to toilet facilities at your workplace?	Yes 1 No 2	
6.1.2.2 Are toilet facilities demarcated for male and female?	Yes 1 No 2	
6.1.3 Is hand washing soap available?	Yes 1 No 2	
6.1.4 Are you allowed to have a rest break during lunch time?	Yes 1 No 2	
6.1.5 Are rest rooms available at your workplace?	Yes 1 No 2	
6.1.6 Do you have a smoking designated area at your workplace?	Yes 1 No 2	

6.2 Personal Protective Equipment (PPE) provision and usage

6.2.1 Are you provided with Personal Protective Equipment (PPE) at your workplace?	Yes 1 No 2	
6.2.2 Do you pay to get PPE?	Yes 1 No 2	

6.2.3 Does PPE fit well (is it the correct size)?	Yes 1 No 2	
6.2.4 Do you feel comfortable when wearing PPE?	Yes 1 No 2	
6.2.5 Do you get a replacement when your PPE is worn out?	Yes 1 No 2	
6.2.6 Do you use PPE every time you perform your duty?	Yes 1 No 2	

6.3 Enterprise community involvement

6.3.1 Do you receive training regarding how to dispose waste?	Yes 1 No 2	
6.3.2 Are you provided with assistance regarding transport to and from work?	Yes 1 No 2	
6.3.3 Are you provided with medical aid benefits?	Yes 1 No 2	

6.4 Occupational health and safety (OHS) improvement

6.4.1 Do you think something should be done to improve OHS in the construction industry?	Yes 1 No 2	

6.4.2 What should be done to improve OHS in the construction industry? …………………………………………………………………………………………… …………………………………………………………………………………………… …………………………………………………………………………………………… …………………………………………………………………………………………… …………………………………………………………………………………………… ………………………………………………………………………

Thank you for your participation.

TRANSLATED QUESTIONNAIRE TO OSHIWAMBO

OMUKANDAPULO **ONOMOLA**

Oshitopolwa shotete: Eeedjo doundjolowele wopaumwene

1.1 Ouyelele wopaunhu nonghalafano

Alikana yandja okangobe pehoololo loye Omunambelewa

1.1.1 Oukwashike koo okanhu	Omulumenhu	1	
	Omukainhu	2	
1.1.2 Ouna eedula ngapi? (Dishangapo)			
1.1.3 Owahombolwa/ la	Inandihombola/lwa	1	
	Ondahombola/lwa	2	
	Ondahengwa/ngana	3	
	Ondafilwa	4	
	Otwatopoka	4	
	Otuli pamwe ashike inatuhombola	6	
1.1.4 Oulongelwe	Kosiputudilo shopombada	1	
	Poshekundofikola	2	
	Peengudu dopetameko	3	
	Inandilongwa	4	
1.1.5 Oilonga yoye yomomatungo	Omutungi	1	
	Omupaindi	2	

	Omulongi womalusheno	3	
	Omulongi wominino domeva	4	
	Omudindoli	5	
	Omulongi woipilangi	6	
	Omushingi	7	
	Omulongi wokomake	8	
	Oilonga imwe inaitumbulwa	9	
1.1.6 Omukalo wakutwa moilonga	Otokalelele	1	
	Owakutwa efimbo langabekwa	2	
	Oholongo fikulimwe ngee waufanwa	3	

Oshitopolwa oshitivali: Eshiivo ngee moilonga omuna elandulafano lekalekepo loundjolowele neameno

2.1 Eshiivo leyandjo leameno noundjolowele moilonga

2.1.1 Moilonga yeni omuna omilandu dekalekepo loundjolowele neameno ngaashi eevete nomilandu edi dina kulandulwa ?	Eheno	1	
	Ahawe	2	

2.1.2 Omilandu neevet dekalekepo woundjolowele neameno odatulwa poluheela todulu kudimona ngee wedipumbwa?	Eheno 1 Ahawe 2	
2.1.3 Owamona omadeulo oundjolowele neameno nghee watameka oilonga ponele apa?	Eheno 1 Ahawe 2	
2.1.4 Oushii ovakalelipo veameno noundjolowele poilonga yeni?	Eheno 1 Ahawe 2	
2.1.5 Oushii omunambelewa woundjolowele neameno moilonga yeni?	Eheno 1 Ahawe 2	
2.1.6 Owa kala nale poihongi taipopi eameno moilonga poilonga yeni?	Eheno 1 Ahawe 2	
2.1.7 Oushii kutya ngee poilonga opaholoka oshiponga otoningi ngaipi?	Eheno 1 Ahawe 2	

2.2 Eshiivo kombinga yelongekido loikumungu inaiteelelwa poilonga neyandjo lekwafo lopakafimbo

2.2.1 Owamona nale omadeulo enasha noikumungu inaiteelelwa taidulu kuholoka poilonga yeni?	Eheno 1 Ahawe 2	
2.2.2 Poilonga yeni oushii ngee opena omalongekido ongee paholoka oikumungu inai teelelwa?	Eheno 1 Ahawe 2	
2.2.3 Oushii ovakwafeli vekwafo lopetameko moilonga yeni?	Eheno 1 Ahawe 2	
2.2.4 Ouna eshiivo kutya oukefa vekwafo lopetameko ovaama peni moilonga yeni?	Eheno 1 Ahawe 2	

2.3 Eshiivo okulopota oinima oyo taidulu okuetifa oiponga nokuingabeka

2.3.1 Oushii apa todulu kulopota oinima oyo taidulu okweetifa oiponga moilonga?	Eheno 1 Ahawe 2	
2.3.2 Oushii ngee oinima oyo taidulu kweeta oiponga moilonga ohaingabekwa?	Eheno 1 Ahawe 2	

Oshitopolwa oshititatu: Oyeetifi yomikundu moilonga

3.1 Ekalepo loyeetifi yomikundu moilonga

<table>
<tr>
<td>3.1.1 Poilonga yeni opena oyeetifi yomikundu moilonga ei tailandula apa?
3.1.1.1 Oyeetifi yomikundu palutu nopamidingonoko:
a) Omaweelelo
b) Ondwi
c)Omakakamo</td>
<td><table><tr><td>Eheno</td><td>Ahawe</td></tr><tr><td>1</td><td>2</td></tr><tr><td>1</td><td>2</td></tr><tr><td>1</td><td>2</td></tr></table></td>
<td><table><tr><td></td></tr><tr><td></td></tr><tr><td></td></tr></table></td>
</tr>
<tr>
<td>3.1.1.2 Oyeetifi yomikundu yoikwaudiyo ngaashi eepainda</td>
<td><table><tr><td>Eheno</td><td>Ahawe</td></tr><tr><td>1</td><td>2</td></tr></table></td>
<td><table><tr><td></td></tr></table></td>
</tr>
<tr>
<td>3.1.1.3 Oyeetifi yomikundu domadilaadilo nonghalafano
a) Okatongotongo
b) Efindilo kongudi</td>
<td><table><tr><td>Eheno</td><td>Ahawe</td></tr><tr><td>1</td><td>2</td></tr><tr><td>1</td><td>2</td></tr></table></td>
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</tr>
</table>

Oshitopolwa oshitinhe: Oiponga ypeenhele domatungo

4.1 Poilonga yeni opaholoka nale oiponga yoludi eli:	Eheno	Ahawe	
a) Okuwa pombada	1	2	
b) Okutjokwa kolusheno	1	2	
c) Okulyatwa kosheendifo	1	2	
d) Okutetwa keshina	1	2	
e) Okudengwa koshiima shawa pombada	1	2	
f) Eetuwa delidenga mumwe	1	2	
g) Okufufilwa metelendja	1	2	

Oshitopolwa oshititano: Omauvela moilonga

5.1 Meemwedi hamanho dapita oweehama omaudu taashikula apa:	**Eheno**	**Ahawe**	
a) Ouyehame wombuda			
b) Okufuda noudjuu			
c) Ouvela woshipa			
d) Okuudako noudjuu			

Oshitopolwa oshiti hamano: Eyandjo loundjolowele neameno peenele domatungo

6.1 Eyandjo loikwafifo yopaunhu peenhele domatungo

6.1.1 Poilonga yeni opena oundjuwo?	Eheno 1 Ahawe 2	
6.1.2. Oundjuwo owatopolwa vaakainhu naalumenhu?	Eheno 1 Ahawe 2	
6.1.3 Moundjuwo omuna ofewa yokwiikosha keenyala?	Eheno 1 Ahawe 2	
6.1.4 Pefimbo lomusha ohamuefiwa mufudepo?	Eheno 1 Ahawe 2	
6.1.5 Poilonga yeni opena eenduda dokufudilapo?	Eheno 1 Ahawe 2	
6.1.6 Poilonga yeni opena onhele yokunwina omakaya?	Eheno 1 Ahawe 2	

6.2 Eyandjo nelongifo yoilongifo yeameno yopaumwene

6.2.1 Poilonga yeni ohamupewa oilongifoyeameno?	Eheno 1 Ahawe 2	
6.2.2 Ohamufutu opo mupewe oilongifo yeameno?	Eheno 1 Ahawe 2	
6.2.3 Moilongifo yeameno ohowanamo nawa (onomola yoye)?	Eheno 1 Ahawe 2	
6.2.4 Ohokala wuudite wamanguluka ngee tolongifa oilongifo yokuliamena?	Eheno 1 Ahawe 2	
6.2.5 Ngee oilongifo yeameno yakulupa ohopewa imwe?	Eheno 1 Ahawe 2	
6.2.6 Oholongifa oilongifo yeameno keshe efimbo tolongo?	Eheno 1 Ahawe 2	

6.3 Elitulemo lehangano mokukwafela oshiwana shopomudingonoko

6.3.1 Owa deulwa kombinga yeekeleshi loimbodi?	Eheno 1 Ahawe 2	
6.3.2 Oho mono ekwafelo linasha nosheendifo shokuya nokudja koilonga?	Eheno 1 Ahawe 2	
6.3.3 Oho pewa omakwafo enasha nepango?	Eheno 1 Ahawe 2	

6.4 Enawapaleko loundjolowele neameno moilonga

6.4.1 Ouna edilaadilo kutya opapumbwa ngeno kuningwasha kombinga youndjolowele neameno moilonga yomatungo?	Eheno 1 Ahawe 2	

6.4.2 Oshike uwete tashidulu kuningwapo okunawapaleka onghalo youndjolowele neameno moilonga yomatungo? …………………………………………………………………………………………………… …………………………………………………………………………………………………… …………………………………………………………………………………………………… …………………………………………………………………………………………………… …………………………………………………………………………………………………… ……………………………………………………………………

Tangi unene eshi wakufa ombinga.

ANNEXURE H

CONSTRUCTION SITE INSPECTION CHECKLIST

CONSTRUCTION SITE INSPECTION CHECKLIST NO…………..

Study title: Development of practical guidelines to promote occupational health and safety for workers in the construction industry of Windhoek, Namibia.

The aim of the study is to develop practical guidelines that seek to promote occupational health and safety in the construction industry in Windhoek, Namibia. The checklist is based on the WHO healthy workplace model (2010) and Regulation No 156 (1997) relating to the health and safety of employees at work. This checklist will be used to inspect the construction sites for data collection purposes.

Section 1: Occupational health and safety practices in the construction sites

1.1 Personal Protective Equipment (PPE) at the construction sites

Elements	**Yes 1**	**No 2**	**Comment**	**For office use**
1.1.1. Do workers put on personal protective equipment (PPE)?				☐
1.1.2 Is the PPE in good condition (not worn out)?				☐
1.1.3 Does the company keep a list of workers who would have been trained on the use of PPE?				☐

SECTION 2: Occupational hazards in the construction industry

2.1 The presence of occupational hazards at the construction sites

Elements	Yes 1	No 2	Comment	For office use
2.1.1 Physical hazards				
a) Noise				
b) Dust				
c) Vibration				
d) Non-ionized radiation				
2.1.2 Chemical hazards				
a) Gases				
b) Fumes				
c) Paints				
2.1.3 Ergonomic hazards				
a) Repetitive motion				
b) Awkward postures				
c) Lifting heavy loads				

2.2 Hazard identification and control

Elements	Yes	No	Comment	For office use
2.2.1 Are hazardous operations identified at the workplace?				
2.2.2 Are safety checks carried out before work commences?				
2.2.3 Is there a system put in place to manage the hazards and risks?				

2.2.4 Are there any surveys that are conducted to determine the noise level at the construction site?				
2.2.5 Is there any safety measure put in place to control vibration?				
2.2.6 Are there details of how incidents shall be notified?				
2.2.7 Are there measures put in place to prevent the generation of dust on the site?				
2.2.8 Is there a waste management policy seeking to prevent environmental pollution?				

SECTION 3: Occupational health and safety provision at the construction sites

3.1 Occupational health and safety management system

Elements	**Yes 1**	**No 2**	**Comment**	**For office use**
3.1.1 Is there any Safety Officer at the construction site?				
3.1.2 Is there any health and safety Committee?				
3.1.3 Has a Labour inspector visited the site since the commencement of the project?				
3.1.4 Is there a mechanism to control the movement of people and transport on the site?				
3.1.5 Are safety signs displayed on the construction site?				

3.2 Provision of welfare facilities at the construction sites

Elements	Yes 1	No 2	Comment	For office use
3.2.1 Are the available toilets adequate for males and females as per Regulation 156 (1997) and depending on the number of workers?				
3.2.2 Are there any change rooms that are available?				
3.2.3 Are there any restrooms that are available?				
3.2.4 Is there any smoking designated area?				
3.2.5 Is the available drinking water separate from the toilet?				

3.3 Electric safety at the construction sites

Elements	Yes1	No 2	Comment	For office use
3.3.1 Is there any notice prohibiting unauthorised persons from handling or interfering with electrical apparatus?				
3.3.2 Are plugs, sockets, extension cords and electrical equipment defect or damaged?				
3.3.3 Are electrical conductors protected through insulation?				
3.3.4 Is the switchboard closed or locked?				

3.3.5 Are the electrical conductors grounded?				
3.3.6 Is there any instruction on emergency isolation switch and supply cutting?				
3.3.7 Are there any electrical wires that are lying in water?				
3.3.8 Are portable electrical equipment safely checked and label tagged for the next inspection?				
3.3.9 Are electrical cables clear from walkways?				

3.4 Work equipment safety at the construction sites

Elements	**Yes 1**	**No 2**	**Comment**	**For office use**
3.4.1 Are ladders in good condition and not damaged?				
3.4.2 Are machines guarded?				
3.4.3 Are the user instructions available for machinery equipment?				
3.4.4 Is the inspection record for work equipment kept on site?				

3.5 Emergency preparedness at the construction sites

Elements	Yes 1	No 2	Comment	For office use
3.5.1 Does the construction site have an emergency plan?				
3.5.2 Is the list of emergency telephone numbers for the police, ambulance and fire department displayed on the station?				
3.5.3 Are safety box minute present?				
3.5.4 Is the register for emergency equipment available?				

3.6 Provision of first aid services at the construction sites

Elements	Yes 1	No 2	Comment	For office use
3.6.1 Is there a first aid station on the site?				
3.6.2 Are there first aid kits on the site?				
3.6.3 Are there any certified first aiders that are available?				
3.6.4 Are there first aid manuals?				
3.6.5 Is there any written procedure for transporting injured workers to the hospital?				
3.6.6 Is the first aid register kept on the site?				

3.7 Fire safety services at the construction sites

Elements	Yes1	No 2	Comment	For office use
3.7.1 Are there any fire prevention procedures that are in place?				☐
3.7.2 Are fire instructions informing the workers what to do in case of discovering fire posted on the site?				☐
3.7.3 Is there any fire warden who has been appointed to coordinate fire activities?				☐
3.7.4 Are fire drills performed and recorded for workers to know what is required in case of a fire?				☐
3.7.5 Are there any fire extinguishers that are available?				☐
3.7.6 Are the fire extinguishers valid and not expired?				☐
3.7.7 Are workers trained on how to use fire extinguishers?				☐
3.7.8 Is the emergency escape route kept clear?				☐
3.7.9 Is the assembly point known to all workers for evacuation procedures?				☐

Researcher’s name ……………………………………………………………………

Signature ………………………………………………………………………………

Date ……………………………………………………………………………………..

ANNEXURE I
DOCUMENT REVIEW CHECKLIST

DOCUMENT REVIEW CHECKLIST NO:

Study title: Development of practical guidelines to promote occupational health and safety for workers in the construction industry of Windhoek, Namibia.

The aim of the study is to develop evidence-based practical guidelines to promote the occupational health and safety of workers in the construction industry in Windhoek, Namibia. A checklist was used to review the OHS related documents at all ten different construction sites and notified occupational accidents, injuries and diseases from the Ministry of Labour, Industrial relations and Employment creation and the Ministry of Health and Social Services in the construction sites for data collection purposes.

SECTION 1: CONSTRUCTION SITE DOCUMENT REVIEW

1.1 Personal health resources documents at the construction sites

Element	**Yes 1**	**No 2**	**Comment**	**For office use**
1.1.1 Are job descriptions available for each workers' job category?				☐
1.1.2 Are health and safety responsibilities stated in the workers' job descriptions?				☐
1.1.3 Does the company keep a pre-employment medical questionnaire that is filled by each worker?				☐
1.1.4 Are there any pre- employment screening reports that are available?				☐
1.1.5 Are the list of names and positions of workers with specific health and safety responsibilities available?				☐

1.2 Documents on hazard identification and control available at study sites

Element	Yes 1	No 2	Comment	For office use
1.2.1 Is there any accident or injury register on site?				
1.2.2 Are the accident investigation procedures available?				
1.2.3 Are injury on duty report forms available?				
1.2.4 Are incidents reporting procedures available?				
1.2.5 Is there any document indicating that workplace inspection is carried out regularly?				
1.2.6 Are checklists used for workplace inspection available?				
1.2.7 Are procedures for action after inspection findings available?				

1.3 Documents pertaining to the provision of occupational health and safety management at the construction sites

Elements	Yes 1	No 2	Comment	For office use
1.3.1 Is there a health and safety policy statement?				
1.3.2 Is the approval letter for construction work by the Ministry of Labour and Social Welfare available?				
1.3.3 Are copies of the Labour act, No11 of 2007 available?				

1.3.4 Are copies of Regulation no156 (1997) Regulations relating to the health and safety of employees at work available?				
1.3.5 Is the health and safety plan for the project available?				
1.3.6 Is the scope of work clearly stated in the plan?				
1.3.7 Are the major activities described?				
1.3.8 Are the types of work described?				
1.3.9 Are there any safe working procedures that are available?				
1.3.10 Are the available company safe work procedures relevant to the project?				
1.3.11 Are safety box minutes present?				
1.3.12 Are there any medical surveillance reports that are available?				
1.3.13 Is there any sickness absence monitoring procedure that is available?				
1.3.14 Is a smoking policy available?				
1.3.15 Is a job risk assessment policy available?				

1.4 Documents related to occupational health and safety induction and training at construction sites

Element	**Yes 1**	**No 2**	**Comment**	**For office use**
1.4.1 Are the induction procedures for new employees stated?				
1.4.2 Are induction modules or an induction course content available?				
1.4.3 Does the company keep register that are signed by workers who would have completed the induction programme?				
1.4.4 Are the registers for periodic safety and health training available?				
1.4.5 Are training registers signed by the workers would have been trained?				

1.5 Documents regarding the psychosocial work environment at the construction site

Elements	**Yes 1**	**No 2**	**Comment**	**For office use**
1.5.1 Is there a stress management policy that is available?				
1.5.2 Is there a policy for rewarding workers on health and safety promotion?				
1.5.3 Is there a policy preventing harassment at work?				
1.5.4 Is there a policy preventing the stigmatisation of HIV infected workers?				

1.5.5 Is there a policy preventing Ethnic group discrimination?				
1.5.6 Are there policies allowing workers to register with trade unions?				
1.5.7 Is there a policy preventing bullying at work?				
1.5.8 Is there a wellness policy that is available on site?				
1.5.9 Is there a policy preventing discrimination on religious grounds?				

SECTION 2: NOTIFIED OCUPPATIONAL ACCIDENTS AND INJURIES IN THE CONSTRUCTION INDUSTRY OF WINDHOEK, NAMIBIA

Please fill in the answers on the space provided or tick the relevant answer

No	Statement	Please fill relevant information
2.1	Sex of injured worker	Male 1 Female 2
2.2	Age (Please specify)	
2.3	Worker's occupation	Bricklayer 1 Painter 2 Electrician 3 Plumber 4 Engineer 5 Carpenter 6 Driver 7 Labourer 8 Other 9
2.4	Date of accident	

2.5	Nature of accident	Minor	1
		Major	2
		Fatal	3
2.6	Source of accident (specify)		
2.7	Body part injured	Head	1
		Eye	2
		Neck	3
		Trunk	4
		Finger	5
		Hand	6
		Arm	7
		Toe	8
		Foot	9
		Leg	10
		General	11
2.8	Nature of injury	Contusions	1
		Abrasions	2
		Burns	3
		Scalds	4
		Arc eye	5
		Concussions	6
		Lacerations	7
		Puncture	8
		Amputation	9
		Dislocation	
		Sprains	10
		Fracture	11
		Asphyxiation/poisoning	12
		Drowning	13
		Electric shock	14

SECTION 3: NOTIFIED OCUPPATIONAL DISEASES FROM THE CONSTRUCTION INDUSTRY OF WINDHOEK, NAMIBIA

Please fill in the answers on the space provided or tick the relevant answer

3.1	Sex of worker	Male 1 Female 2
3.2	Age (please specify)	
3.3	Worker's occupation	Bricklayer 1 Painter 2 Electrician 3 Plumber 4 Engineer 5 Carpenter 6 Driver 7 Labourer 8 Other 9
3.4	Occupational disease	
3.5	Date of diagnose	

Researcher's name ……………………………………………………………………………

Signature ……………………………………….. Date ……………………………………