HEALTH AND SAFETY RISKS AMONG THE THULAMELA MUNICIPALITY WASTE HANDLERS IN THE LIMPOPO PROVINCE, SOUTH AFRICA

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DECLARATION

I, **Takalani Ngobeni** declare that the mini-dissertation "**Health and Safety Risks among the Thulamela Municipality Waste Handlers in the Limpopo Province, South Africa.**" hereby submitted for the degree of Master of Public Health (MPH) at the University of Venda has not been submitted previously by me at this university or any other institution; that it is my own work in design and in execution, and that the sources that I have quoted have been indicated and acknowledged by means of complete references.

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Signature Date

DEDICATION

I would like to dedicate this mini-dissertation to my kids, Rifumo, Risana and Rivoningo Ngobeni, as they are the reasons I wake up every morning and work hard. I am so thankful to God for blessing me with these beautiful children.

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LIST OF ABBREVIATIONS AND ACRONYMS

CBD	Central Business District
COIDA	Compensation for Occupational Injuries and Diseases Act
ILO	International Labour Organisation
MSDs	Musculoskeletal Disorders
NEMWA	National Environmental Management: Waste Act, 2008 (Act No.59 of 2008)
OHSA	Occupational Health and Safety Act
PPE	Personal Protective Equipment
USA	United States of America
TB	Tuberculosis

ABSTRACT

Health and safety issues pertaining to workers are global concerns and a major priority to the employers and government respectively. Employees in general across industries are faced with various health and safety risks. Epidemiological research has shown consistently that waste handlers are mostly exposed to various risks and hazards during their work as compared to other professions globally. This study focused on waste handlers employed by the Thulamela Municipality in the Limpopo Province, South Africa. The study employed qualitative explorative design and targeted all municipal waste handlers. Municipal waste handlers were sampled using non probability purposive sampling. In-depth interviews, using an interview guide, were conducted by the researcher and a voice recorder was used to record data from the participants after obtaining permission from them. The sample size comprised of 18 participants and was determined by data saturation. A thematically analysis technique was used to analyse data. Data from the participants were clustered into main theme, categories and sub-categories. The following themes emerged from data analysis: physical hazards, psychological hazard, biological hazards and chemical hazard. The study revealed that the municipal waste handlers are exposed to various occupational risks and are experiencing shortage of personal protective equipment, ranging from hand gloves, safety helmets, rain coats, overall uniforms, safety jackets and boots, to keep themselves safe from health problems and occupational injury when collecting waste. It is recommended that the Thulamela municipality should prioritise the working conditions for municipal waste handlers, by distributing suitable personal protective equipment such as hands gloves, safety helmet, rain coats, safety jackets and boots) and overalls

Key terms: Health and safety risks, Waste handlers

CHAPTER 1

OVERVIEW OF THE STUDY

1. INTRODUCTION

The purpose of the study was to investigate health and safety risks faced by Thulamela Municipality waste handlers in the Limpopo Province, South Africa. This chapter covers the following aspects: background of the study, problem statement, rationale of the study, significant of the study, aim and objectives of the study, theoretical framework, definition of concepts and the chapter outline.

1.1 Background to the study

Urbanisation and industrialisation continues to grow at an accelerated rate across the world. Urbanisation refers to the growth of cities due to industrialisation and economic development. Consequently, waste from different households, commercial establishments, institutions, markets, industries and on the streets, needs to be managed. This implies that there is a need for proper management of the waste produced in the cities. Waste generation varies across the countries, towns, municipalities and areas in general, depending on the level of industrialisation and urbanisation (McGranahan & Satterthwaite, 2014). In most developed countries solid waste is managed through waste collection which is often done by automated machines. In developing countries, waste is collected by individual workers employed by the city to collect waste (Sthiannopkao and Wong, 2013). In Africa, solid waste in household yards is stored in plastics bag or bins until the collection day. Residents in low-income areas who are using plastic bags are given six plastic bags per household, a minimum of one refuse bag to be used on a weekly basis (Otieno & Kgaogelo in Godfrey & Oelofse, 2017).

Employees who collect solid waste are called by different names, such as waster collectors or waste handlers. Generally, within individual households and in certain areas in towns or cities they are allocated a trash bin where people can put waste. These are placed in various strategic points in the city as part of the waste management strategies. In addition, businesses and other establishments have their own trash bins for depositing waste (Guerrero, Maas & Hogland, 2013).

Unfortunately, these trash bins do not take much time to fill, hence, solid waste handlers or waste handlers are tasked with the duty of picking up waste from households, business areas and other areas around the city. In addition, people do not only put waste in the provided trash bins but they deposit waste around the bins and waste handlers are left to deal with the mess (Guerrero, et al., 2013). The work of the waste handlers includes picking up waste, emptying refuse bags and disposing waste to landfills. In general, waste handlers labour involves the lifting, pushing, pulling and carrying of waste (Borowski, et al., 2015). Pulling, lifting, pushing and carrying of objects act as a stimulator to musculoskeletal disorders (Lunde, 2017). Furthermore, waste handlers are exposed to raw waste and decomposed waste which sometimes produces bad odours and poses health hazards from infectious diseases and toxic gases. In addition, the refuse handlers are victims of endotoxins, irritant inhalants, moulds, noise and bacteria attacks (Tsovili, et al., 2014). Furthermore during their work, waste handlers are exposed to hazardous waste such as human waste, poisonous gases, sharp objects, spilled chemicals, pesticides and health care waste (Tsovili, et al., 2014).

Consequently waste handlers experience occupational health risks due to the nature of their work. Available evidence suggests that waste handlers are exposed to occupational risk that may affect their health (Brauer, 2016). A study conducted in the USA suggests that municipal solid waste workers 20 times more likely to experience occupational accidents as compared to other profession (Kuijer, et al., 2014). The study further highlighted that the injuries experienced by the refuse workers was as a result of loading, driving and work shift (Kuijer & Frings-Dresen, 2014). Likewise a study conducted in India concluded that waste handlers suffered from occupational related ailments such as eye disorders, breathing problems and skin infections (Jayakrishnan, et al., 2013). Furthermore the study indicated that they experienced frequent accidents which resulted in injuries and water borne diseases (Jayakrishnan, Cherumanalil Jeeja, & Bhaskar, 2013).

In another study carried out in Ethiopia among local council refuse workers, a high rate of occupational accidents prevalence was found 43.75 within a period of 12 months signifying much higher than in other sectors (Bogale, et al., 2014). Additionally, waste handlers are also victims of musculoskeletal disorders (MSDs). Also an Egyptian study concluded that waste handlers had a 60.8% chance of experiencing musculoskeletal disorder as compared to other employees in the public sector (Abou-ElWafa, et al,. 2012).

The rate of urbanisation and industrialisation continues to grow including in South Africa (Fox & Goodfellow, 2016). Major urban hubs such as Johannesburg, Pretoria, Cape Town and Durban are experiencing accelerated urbanisation growth. This comes with increased demands for establishing and implementing effective waste management, as the population continues to increase in these cities (Fox & Goodfellow, 2016). South African municipalities rely on manual garbage collection by waste handlers. However, they use automated vehicles for the transportation of garbage. Thus, like other regions and countries, garbage collectors are exposed to health and safety hazards, as they are involved in carrying, lifting and emptying bins and sorting waste either raw or decomposed (Battaglia, et al., 2015). Employees in South Africa are subject to a number of protective legislation. The major legislation governing these issues is the Occupational Health and Safety Act (OHSA) and Compensation for Occupational Injuries and Diseases Act COIDA). The OHSA safeguard the employee wellness and provides technical guidance on health and safety issues affecting employees. COIDA seeks to compensate employees or worker for injuries caused at work, and diseases that are caused by work related activities. These two pieces of legislation are nationally recognised and enforced through the labour laws and the constitution. Thus, all organisations, institutions and municipalities in the country, including the Thulamela Municipality, are required by the law to follow these health and safety guidelines stipulated in the OHSA.

1.2 Problem statement

The Thulamela Municipality is experiencing problems regarding the high number of sick days and work-related accidents among the waste handlers. According to the health and safety records for the Thulamela Municipality, in 2016 the waste handlers had the highest number of people who requested for sick leave, and were absent from work (Thulamela Municipality OHS report, 2016). Most of the sick leaves requests were due to work-related incidents. The waste handlers, through their union representatives, lodged complaints regarding the safety of the employees. The Thulamela Municipality's health and safety records show that in 2016, 35 occupational injuries were reported and in 2017 43 were reported. Simultaneously, the number of sick days in 2016 was 148, and in 2017 were 153 among municipality waste handlers.

1.3. Rationale of the study

Despite, the growing evidence of these health and safety hazards to waste handlers there is little documentation of health and safety risks in the country and Thulamela. Also, the available literature does not clearly indicate the extent of health and safety hazards for waste handlers in the Limpopo Province with reference to the Thulamela Municipality. Therefore, the study sought to investigate health and safety risks among the Thulamela Municipality waste handlers in the Limpopo Province, South Africa.

1.4 Significance of the study

This study should assist to provide up to date evidence about health and safety in Thulamela and beyond. To date there are few studies that have attempted to document health and safety hazards affecting waste handlers in South Africa. The insights gleaned from the study could assist municipality officials to come up with innovative answers so as to ameliorate and better the working conditions of waste handlers. Also, the study offers suggestions for suitable safety precautions for waste handlers and the provision of necessary safety clothing to prevent and minimise these health hazards. The findings of the study may significantly expand knowledge about occupational risk associated with waste handling. Although occupational injuries are increasing globally much is not understood about the health risk facing waste handlers. Lastly, the outcomes from this study could assist future researchers who want to conduct studies on related topics, as they may use the recommendations of the study to shape their studies.

1.5. Aim of the study

The purpose of the study was to investigate health and safety risks among the Thulamela Municipality waste handlers in the Limpopo Province, South Africa.

1.5.1 Objectives of the study

The objectives of this study were to:

- Explore the work-related health and safety risks among the Thulamela Municipality waste handlers.
- Describe the work-related health and safety risks among the Thulamela Municipality waste handlers.

1.6 Definition of concepts

Waste handlers

Borowski, et al., (2015) defined waste handlers as people who one way or the other are involved in pushing, pulling, lifting and carrying waste or solid matter to disposal or processing facilities. In this study, waste handlers refer to municipal employees, employed as general worker who are involved directly or indirectly in picking up waste, emptying refuse bags, delivering waste to the disposal and processing facilities, lifting, pushing, pulling and carrying of waste or waste.

Health and safety risk

Health and safety risk refers to the "probability that injury or damage will occur, it means a source of or exposure to danger" (OHSA (85 OF 1993). In this study, the above definitions will be adopted because this is the standard definitions used in health and safety literature.

Waste

Waste means "any substance or object which the holder discards or intends or is required to discard" (Selin, 2013). The study understands waste as anything that households, businesses or any institution discard when no longer in use.

1.7 Chapters outline

The thesis is comprised of the following chapters:

Chapter 1: Overview of the study

Chapter 2: Literature Review

Chapter 3: Research Methodology

Chapter 4: Presentation and Discussion of study findings

Chapter 5: Summary, Conclusions and Recommendations

1.8 Summary

This chapter introduced the study undertaken.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature review focuses on global municipal waste management process, occupational hazards and occupational health legislations in South Africa. The research searched recent research literature about waste management around the world which focuses on occupational health problems, common to municipal waste handlers, including respiratory diseases, musculoskeletal disorders, and water-borne diseases, dermatology, eye problems and gastrointestinal diseases. In addition, the waste handlers are involved in serious workplace accidents more than any other profession globally.

2.2 Municipal solid waste management

Municipal solid waste management involves waste collection, transfer, resource recovery, recycling, and treatment. The main objective is to protect the health of the population, promote environmental quality, develop sustainability and support economic productivity. The local municipalities are the custodians of waste management in South Africa. In South Africa solid waste management is a very complex process involving a set of processes such as storage, collection, sorting and segregation, transportation, and finally disposal of waste in sanitary landfill sites (Department of Environment Affairs 2012). The typical municipal solid waste management system implemented in most municipalities in South Africa comprises of collection of waste from the point of generation, transportation of waste to the treatment or landfill site, treatment of waste including sorting and separation of waste at disposal sites, disposal and recycling (Department of Environment Affairs 2012). These are discussed in detail as follows:

2.2.1 Waste generation and storage

Waste generation is normally at the source of waste where it is either thrown away or gathered for disposal. The best place to separate is at the source. The storage of waste at the source is substantially lacking in most urban areas in South Africa. There bins in South Africa are the common source of storage and non-separation is practiced. There are different types of bins in South Africa for site storage of waste which include 85 litre black plastic bins, 85 litter rubber or

steel bins and 120 mobile bins for community collections (Department of Environment Affairs 2012) **(See Figure 1).**

2.2.2 Waste collection

The aim of waste collection is to separate the generated waste from the point of source for health reasons and for the protection of the environment. Waste collection in South Africa is typically carried out using conventional motorised collection vehicle-based systems, often with compactor vehicles. In areas without a formal refuse removal service there is fairly widespread use of communal collection. There is limited but increasing use of labour intensive collection, and of non-motorised collection in non-urban areas (Department of Environment Affairs 2012). **(See Figure 1).**

2.2.3 Transfer of Waste

A transfer station is a facility for transferring waste from the collection vehicle to a more appropriate vehicle. The purpose is to reduce the transport unit cost (Department of Environment Affairs 2012). First, the waste is transferred from a smaller collection vehicle to larger transport equipment. The waste is then transported, usually over long distances, to a processing or disposal site. **(See Figure 1)**

2.2.4. Waste disposal

The current approach to general waste treatment and disposal in South Africa is typical of a developing country in that treatment of the waste generally involves only a reduction of its volume, although some limited incineration and composting is practiced. The emphasis remains on disposal of general waste by landfill without treatment as landfill airspace is still fairly readily available in South Africa and it remains the lowest cost disposal option. According to the National Treasury (2011), 95% of all South Africa's waste is disposed of in landfill sites. The land fill sites are governed by section 20 of Environmental conservation Act 73 of 1989 and should meet the minimum requirement for waste disposal. Disposal of waste at the landfill involves burying the waste and this remain a common practice in most countries. The landfill is structurally engineered and operated to compact and cover waste (Department of Environment Affairs 2012). **(See Figure 1)**

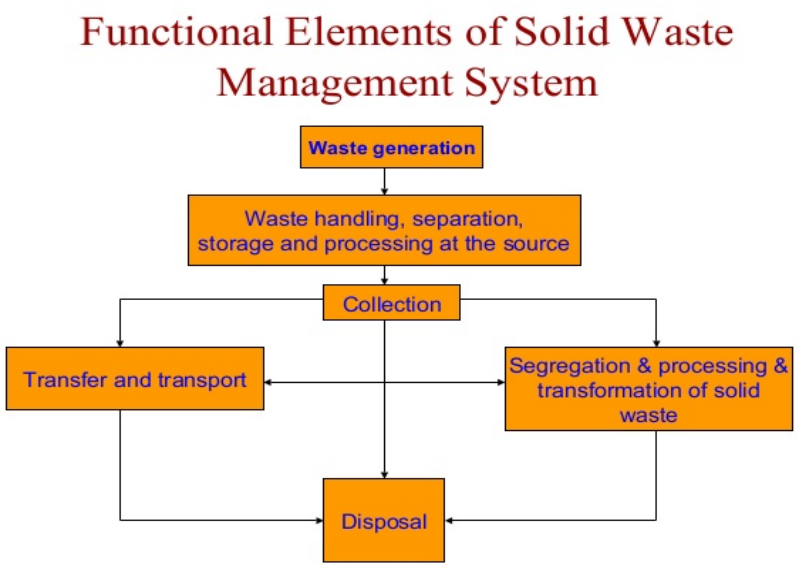

Figure 1: Municipal solid waste management system(Department of Environment Affairs 2012)

2.3 Occupational health and safety hazards associated with municipal solid waste management.

According to Nkosi (2014), solid waste management is a risky job associated with physical, chemical, biological, mechanical, psychosocial hazards which pose health problems to the workers. In most countries in the developing world municipal solid waste is collected manually which poses health problems to waste handlers. The hazardous components of waste pose physical, chemical, radiological and/or microbiological risks to the public and those involved in their handling, treatment, and disposal. They are discussed in detail below:

2.3.1 Biological Hazards

According to Laitinen & Rantio, (2016) "these are waste materials that contain nutrients and are often moist, thus providing a favorable environment in which micro-organisms can thrive". For example health care related waste contains pathogenic micro-organisms and poses a risk of infection.

According to a review conducted in the European Union, municipal solid waste handlers in comparison to general public were six times more likely to contact infectious diseases, allergic pulmonary diseases, chronic bronchitis, and hepatitis (Salkin, & Kennedy, 2001). A study conducted by Ncube, et al., (2017) confirms that waste handlers are bitten by insects and, cut by broken glass or razor blades and as a result, they reported to suffer from a number of occupational health diseases. This is a cause for concern since a number previous studies have linked continuous exposure of workers to the above mentioned conditions has led to developing diseases such as asthma, hay fever, malaria and cancer (Jerie, 2016).

Literature also suggests that waste handlers suffer from respiratory ailments as a result of their work. According to an epidemiological survey conducted among 400 waste handlers in India suggest that the majority of them suffered from respiratory ailments such as coughs and dyspnoea (Jayakrishnan, et al., 2013). Similar findings were reported in a study conducted in Thailand which shows that waste handlers suffered from bronchitis (World Health Organization, 2004). Nkosi (2015) observed that waste handlers in South Africa are exposed to dust particles and odour in landfills, during sorting and collection of waste and hence they develop chest problems.

Eye problems due to waste management activities have been reported in a number of studies. For instance a study conducted in the USA suggests that waste handlers reported eye injuries due to cuts by sharp objects inside waste bags and exposure to highly concentrated chemicals (Rojers et al 2010). Highly concentrated chemicals have been responsible for burning eyes, watery discharge and dimness of visions (Jayakrishnan, et al., 2013).

2.3.2 Physical Hazards

According to a systematic review conducted in Brazil solid waste handlers are exposed to solar radiation, with intense heat or cold alongside exposure to climatic changes. In addition, they are subject to noise and intense vibrations caused by work equipment, therefore leading to hearing loss (Pereira-de-Paiva, et al., 2017).

Solid waste management is highly physical and manual occupation, therefore most waste handlers in the literature are exposed to physical hazards (Jirwe, 2016). These ranges from being cut by bottles and razors, bruises, fractures and slipping from moving trucks. In regard to the sharp objects most of them are so sharp that they tear off gloves hence the tetanus and other skin infections emanate (Jerie, 2016). Studies among recyclers in Vietnam revealed that

17 % of them were exposed to garbage trucks accidents in either minor or major collision (Binion & Gutberlet, 2012). While solid waste workers occasionally wear gloves, they are quickly worn out and rendered useless exposing them to needle punctures or glass cuts (Jerie, 2016). Furthermore Pereira-de-Paiva, et al., (2017) also concluded that waste collectors are exposed to the risk of being run over by trucks and other hazards, including animal attacks, especially dog attacks, and amputations through equipment used at work.

2.3.3 Chemical hazards

According to Milczarek,Schneider, et al., (2009) chemical hazards in waste management is produced by waste during collection, transportation and disposal. Waste handlers who are exposed to these hazardous chemical substances during waste management activities have been reported to suffer from serious health risk.For instance waste workers in USA who inhaled arsenic waste in incinerators have been reported to suffer from increased incidence of hypertension, cardiovascular disease, diabetes, skin cancer and genital disorder (Pohanish, 2017). Furthermore waste handlers exposed to Cadmium a heavy toxic in Europe, which when inhaled in sufficient quantities damages organs and causes, cancer, respiratory tract infections, lung oedema and kidney impairment (Cogliano, et al., 2011).

Binion and Gutberlet (2012), contend that exposure to chemicals is associated with anatomical poisoning and skin irritations or injuries, such as burns and respiratory diseases. Jerie (2016) finds that chemical exposure causes dermatitis, respiratory system inflammation, liver damage, and central nervous system disruption. The main routes of chemical absorption are through inhalation, dermal contact and ingestion. Although chemical contaminants occur in solid waste in negligible quantities, they have serious health implications for solid waste handlers.

A study conducted in Ethopia reveals that waste handlers exposed to chemical hazards in literature has been linked to blood cancers, skin infections, burns, irritations , allergies, and respiratory ailments (Eskezia, et al., 2012). An epidemiological study revealed exposure to chemical has been linked to gastro intestinal, dermatitis, liver or kidney damage and brain damage (Jerie, 2016). Sarkar's (2003) study in India, reveals that waste recyclers working in landfills had high levels of lead in their blood and the findings led researchers to associate solid waste work with increased bioaccumulation. Furthermore, exposure to waste dumpsites has indirect effects on the health of nearby dwellers. Studies conducted by Medina (2005) and Cointreau (2006) in Mexico and developing countries, respectively, found that breast milk from women living near landfills was contaminated with lead and dioxin-related compounds.

Some of the more commonly reported occupational health and injury issues among municipal waste workers are respiratory disease (due to particulate inhalation, bio-aerosols and volatile organics during waste collection), infections (due to direct contact with contaminated materials, dog and rodent bites, or eating waste - fed animals), punctured wounds (may lead to HIV, tetanus and hepatitis) and noxious content of waste and odour may lead to headaches and nausea (Cointreau, 2006). Another occupational health problem linked to waste management activities is dermatological disorders. A review which collated municipal studies conducted in developed and developing countries suggests that waste management activities are usually done by hand, hence workers suffer from skin problems because their hands come into direct contact with waste laced with poisonous chemicals (Contreau, 2006). Likewise, a cross sectional study conducted in India suggests that skin and nail infections resulting from work were the most self-reported problem (Jayakrishnan, 2013). Priyanka, Patil, Kamble (2017) in their study in Central India found that most handlers had skin problems such as skin itching and rashes.

2.3.4 Ergonomic Hazards

Waste collection work is a physically demanding occupation characterized by lifting heavy loads that cause musculoskeletal problems to develop (Jerie, 2016). The job tasks may be characterized by activities such as lifting heavy objects, sitting and/or standing for long periods of time, reaching objects and repetitive tasks that contribute to the development of musculoskeletal disorders (MSDs). Previous studies have linked the occurrence of musculoskeletal disorders and handling in developing and developed countries (Kuijer & Fringe-Dresen, 2004). This is supported by a study conducted in Iran which reported that municipal waste handlers complained about lower back pain, and stiff, or painful neck and shoulders which are all symptoms of musculoskeletal disorders. Similar findings were reported by a study conducted in Pakistan which suggested that waste collection which involves lifting was linked to back pain, stiff neck, swollen shoulders, joints pain and arms (Jayakrishnan, et al., 2013). In another study conducted in India similar symptoms such low back pain were reported, elbow pain and wrist pain (Priyanka, et al., 2017).

A study conducted in Egypt by Abou-ElWafa, et at., (2012) on the prevalence of MSDs revealed that low back, then shoulders, neck, knees and thighs and elbows are the most frequently affected body regions among solid waste workers. In Denmark, the frequency of musculoskeletal complaints among refuse collectors was two times higher than for the total

Danish workforce. A similar outcome was reported in Taiwan where the risks of low back and elbow or wrist musculoskeletal complaints among refuse collectors were more than twice as high than those of their colleagues working in the office (Cointreau, 2006).

2.3.5 Psychosocial hazards

Another common hazard affecting waste handlers is psychosocial hazard. Waste workers continue to suffer from historical discrimination, with the devaluation of their work by society, government and employees, as well as precarious working conditions and a general lack of training (Pereira-de-Paiva, et al., 2017).

2.4 Regulatory framework governing waste handling personnel in South Africa.

The following regulations were developed to protect the workers, including waste handlers in a working environment:

2.4.1 The Occupational Health and Safety Act No 1993

According to the Occupational Health and Safety Act (Act 85 of 1993) (OHSA) the employer is responsible for the safety of the employees. This means the employer should make sure that employees works in an environment free of hazards. The employer is supposed to take extra cautionary measure so as to make sure that employees are safe. Furthermore it mandates the employer to provide the necessary equipment such as personal protective equipment to the workers. The employer is supposed to give technical guidance to employees in regards to work place safety. The Act has sub regulations which specify the requirements for facilities. These are discussed below.

2.4.1.1 Sanitation

Every employer shall provide sanitary facilities at a workplace such as free toilet paper, water closet pan designed with a seat, a towel to every employee, toilet soap or a similar cleansing agent, running hot and cold or premixed hot and cold water for washbasins. Furthermore, in regards to showers the walls should be smooth and impermeable, slip-free and sloped for effective drainage and with windows. In respect of each room in which there are closets, urinals, showers or washbasins, every employer shall be provided with a conspicuous sign outside the entrance to such a room to indicate the gender of the persons for whom the room is intended. The rooms shall be ventilated in accordance with the provisions of the National Building Regulations with screen walls, partitions or doors in order to provide privacy; and that water

feeding to showers or washbasins on his or her premises which is not obtained from the water supply system of a local authority, complies with SABS 241.

2.4.1.2 Facilities for Safekeeping

An employer in a workplace shall provide every employee in his or her service, excluding office workers, with a personal facility for safekeeping in which clothes or other personal items of the employee can be kept safely and in a good condition. Every employer shall ensure that every employee referred in this sub-regulation shall store his or her clothing and other personal items in his or her facility for safekeeping. The provisions of this regulation shall not apply in respect of activities for which specific types or numbers of facilities for safekeeping are prescribed.

2.4.1.3 Changing rooms.

In respect of employees for whom showers are prescribed; or who need to undress, the employer shall provide separate changing rooms for males and females respectively, in accordance with Part C of SABS 0400. (2) An employer contemplated in sub-regulation (1) shall (a) ensure that a changing room is not connected directly by means of a door or of any other opening to any room in which there is exposure to a hazardous chemical substance or a hazardous biological agent; or in which untanned hides or skins or unwashed wool or mohair are treated, processed or stored;(b) provide adequate seating in the form of chairs or benches in every changing room for the maximum number of employees that will be using such changing room at any one time;(c) not store any material, tools or other goods not related to use of a changing room in such changing room or allow such items to be stored therein;(d) where a change-room has windows, glaze such windows in obscure glass or similar material;(e) screen the entrance of every changing room in order to afford privacy; (f) provide a conspicuous sign at the entrance to a changing room to indicate the gender of the persons for whom the changing room is intended;(g)provide facilities for the drying of wet clothes, if the employees for whom the changing room has been provided, may become wet in the course of their work;(h) ensure that every changing room is naturally or artificially ventilated in accordance with Part O of the National Building Regulations; and (i) ensure that no employee referred to in subregulation (1) changes his or her clothing at any other place at a workplace than in the changing room provided for him or her. (3) Subject to the provisions of regulation 5 an employer may allow a changing room to be used for the partaking of meals provided that—(a) an obscure partition that reaches the ceiling or roof is installed between showers and eating places; and (b) there is no direct communication between the changing room and the toilet facilities.

2.4.2 National Environmental Management: Waste Act, 2008 (Act No.59 of 2008)

According to the NEMWA No.59 of 2008) (NEMWA), suggests that in regard to health and welfare of waste personnel they are supposed to be subjected to (i) Regular medical check-ups to ensure their health and well-being, (ii) provided with personal protective equipment, gloves, masks, overalls and raincoats, gumboots and (iii) provided with on-going training on health and safety issues. These regulations are meant to serve as guide to employers in regard to health and safety of employees. They can be effective if the regulatory mechanism is supported by all stakeholders such as employers and inspectors alike.

2.5. Theoretical framework

The study was guided by the epidemiological triad model. The epidemiologic triad involves the interrelationship between the environment, host and the agent and how the environment, host and agent affect the health of municipal waste handler.

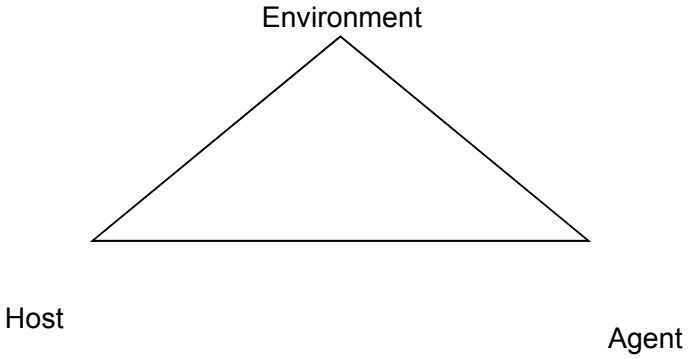

Figure 2: Epidemiological triad (Ncube, 2017)

2.5.1 Environment

According to Ncube (2017) “the environment is all that is external to the host and these are extrinsic factors that affect the agent and the opportunity for exposure”. Municipal solid waste handlers find themselves working in an environment with great exposure to hot and cold temperatures. Ncube (2017) suggests that the environment in which waste handlers work in such as streets, landfills, and household are linked to a plethora of occupational health risk that affect these workers.

2.5.2 Host

The host in this case is the workers. Municipal waste handlers are exposed to a number of factors in the workplace therefore they experience disease or injuries.

2.5.3 Agent

In this study the agent is the equipment which the workers use for example, the municipal waste handlers use vehicles such as compactor trucks, half trucks, skip loaders, and other equipment such as refuse bins. Climbing on a municipal vehicle can also affect their health. If the trucks are not well-serviced, it can also affect the workers' hearing. The interaction of the agent, host and environment determines an individual's state of health. These three elements work hand-in-hand, meaning that if one is affected, it automatically affects the other. If the working environment is not conducive, it affects the health of employees and lead as to health risks.

2.6 Summary

The municipality waste collection is work done manually and requires physical strength in lifting bulky waste containers. This literature review revealed that by the nature of the work for waste handlers they are much exposed to various occupational health and safety risk associated with the characteristic of the waste they are handling, the method of waste collection, the use and the nature of the environment they are working on. Lack of personal protective equipment can cause risk for the waste to experience health and injury problems. Therefore, the municipal waste handlers should be given adequate personal protective equipment and training should be given on health and safety issues, in order to reduce the health and safety risk problems at their working environment.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introductions

This chapter covers the following aspects: research design, study setting, target population as well as the sampling method and sampling procedure that was utilized. Furthermore, this section focuses on the instrument and method that the researcher used for data collection, as well as data quality measures, data analysis and ethical issues.

3.2 Research design

Babbie and Mouton (2010) state that “a research design refers to a plan or a blueprint of how one intends conducting the research”. A qualitative approach using an exploratory design was utilised. According to Bernard (2017), a qualitative approach is used in the circumstances whereby not much is understood about the issue. Therefore, this study warrants the need for a qualitative study, so as to gather a deeper understanding o the work-related health and safety concerns among waste handlers. An explorative design’s purpose is to uncover new facts, and establish patterns in the data (Corbin & Strauss, 2015). An explorative design was employed so as to gain more facts on the health and safety risks among the Thulamela municipality waste handlers in the Limpopo province, South Africa.

3.3 Study Setting

The study was conducted in the Thulamela Municipality which is located in the Vhembe District, of the Limpopo Province, in South Africa. The Thulamela Municipality is the largest of five municipalities in the Vhembe District. The Thulamela municipality has a fast-growing population according to the IDP (2011/12). In fact he Thulamela Municipality is one of the largest of all the municipalities falling in the Limpopo Province. A recent census report showed that there about 618,427 residents currently living in the Thulamela Municipality. It is home to the major towns of Thohoyandou, Sibasa and Mutale, which are the largest populated towns in the municipality. Urbanisation and industrialisation of these three cities continue to rise, thus dangerous chemicals and products are becoming part of the waste that is collected by waste handlers. Tshivenda is the common spoken language in the area. The municipality has seven

departments namely: Roads Services, Human Settlements, Community Services, Town & Regional planning, Corporate Services, Municipal Managers office, and Governance. The Community Services department is among the seven departments which has following divisions:

- Registration & Licensing,
- Traffic Law Enforcement,
- Environmental & Waste Management,
- Sports, Arts and Culture
- Parks & Cemetery services

Municipal waste handlers are responsible for waste collection within the Environment & Waste Management division. Collections are done every day in the Central Business District (CBD) and once a week in households and villages within the municipality. The municipality collects 5761 cubic meters of the waste each year and more than 47, 7% of the population of Vhembe District reside in Thulamela Municipality (Thulamela Municipality, IDP 2016/FINANCIAL, 2016).

Figure 3: Thulamela Municipality Area (Study Area) (Thulamela Municipality IDP 2016)

3.4 Study population and sampling

3.4.1 Population

Polit (2013) refers to “study population as the total number of subjects or objects from where data will be collected and results inferred”. The study targeted all employees who were

employed as waste handlers in the Thulamela Municipality. The Thulamela Municipality, Environment and waste division consists of 54 employees.

3.4.2 Sampling

It is the process of selecting the participants to take part in the study (Neuman & Karen, 2014). In this study, the researcher used purposive sampling to select the participants due to the special characteristics that they possessed. The rationale to use this sampling was based on the researchers' judgement on the key participants that possess the needed information or who have the knowledge about the research problem or question (Brink, Van der Walt & Van Rensburg, 2012; Creswell, 2014). About 18 respondents participated in this study and they were determined by data saturation.

For a participant to be included in the sample, he or she was supposed to meet the following criteria:

Be a

- Municipal employee within the Environment & Waste division working as a waste handler (Male & Female)
- Must have at least 3 months working experience as a waste handler, and
- Be willing to participate in the study

3.5 Data collection Method

Individual in-depth interviews were used to collect data from 18 participants. An interview guide was used to collect data from the municipal waste handers. It comprised of open-ended questions that allowed the researcher to probe for more information. One central question was used by the researcher: **"May you please explain to me the health and safety risks that you experience in your day to day work"**. Probing questions were raised by the researcher, in response to the information provided by participants during data collection.

3.6 Pre-test

Before collecting the actual data the researcher conducted a pre-test with five waste handlers. This assisted the researcher to check if the information provided was relevant to the topic and helped in improving the interviewer skills of the researcher. The findings from the pre-test interviews were included in the study as they provided valuable information.

3.7 Data collection procedure

Data collection was collected after the ethical clearance and permission was granted by relevant authorities first written permission was granted by Municipal Manager at the Thulamela Municipality and prior arrangements were made with the participants. The researcher made appointments with each respondent and availed herself at the time and date convenient to the participants for the interview. The researcher informed the participants about the study and its main rationale. Participants were also informed about their right to withdraw during the interview if ever they wish to do so. The researcher used probing questions in response to the answers provided by the participants during data collection in order to fully understand their experiences with regard to health and Safety risks that they are exposed to on their day to day work.

Various techniques, such as field notes, observation, audio tape, were used during data collection. The researcher used field notes in order to record non-verbal cues displayed by the waste handlers during the interview such as sighing and nodding. A voice recorder was used with the consent of the waste handlers, to record the conversation during the interview. The voice recorder was tested if it was working before data collection and waste handlers were shown the stop button, so that they could stop the recording whenever they were no longer comfortable with it. Data was collected by the researcher in Tshivenda and Xitsonga languages, to allow the participants to freely express themselves. The researcher is fluent in both Tshivenda and Xitsonga languages. Individual in-depth interviews were conducted for approximately 40-45min during data collection.

3.8 Data analysis methods

A thematic analytical approach to analyse the data was used by the researcher to analyse data in this study (Braun & Clarke, 2013). The researcher used the following steps recommended by Braun& Clarke, 2013 to analyse becoming familiar with the data, transcription of verbal data,

generating initial codes, reviewing categories, defining and naming categories and producing the report.

3.9 Measures to ensure trustworthiness

To ensure that the findings for this study are a true reflection of a human experience, the researcher used four criteria, for establishing trustworthiness, namely: credibility, dependability, transferability and confirmability (Creswell, 2014) were used to describe various aspects of trustworthiness.

3.9.1 Credibility

Credibility in this study was achieved since the researcher was involved in a prolonged engagement with the participants, by spending time with them during data collection and not displaying any act of being in a hurry. The interaction resulted in good rapport development between the researcher and respondents. During data collection the interviewer confirmed with the participants if the findings represented their opinions accurately.

3.9.2 Dependability

To ensure dependability an auditable trail and use of tape recorder were used to increase reliability when doing all interviews (De Vos., et al.,2013).

3.9.3. Confirmability

Discussion of the results with an independent coder was done to ensure confirmability. Furthermore an audit procedure was utilised in which all interviews details were recorded.

3.9.4. Transferability

A detailed description of all the study procedure ranging from methodology, findings and interview extracts was provided to ensure transferability. In addition assistance of an experienced qualitative researcher was obtained to read and help with themes and subthemes (Marshall & Rossman, 2016).

3.10. Ethical considerations

The following ethical procedures were considered during data collection with the participants.

3.10.1 Permission to conduct study

The right to conduct the study was granted by the University of Venda Ethics Research Committee, and written permission was sought from Thulamela municipality Managers (Appendix B).

3.10.2 Informed consent

Before collecting data written informed consent was secured from the participants. The researcher verbally explained what the research was about and read the information sheet with them. The researcher then took responsibility of making the waste handlers aware that their taking part in the study was upon their willingness to do so. In addition, they were not deceived into participating in the study. The participants were also fully informed that their participation was voluntary in such a way that was able to discontinue their participation at any time.

3.10.3 Confidentiality and Anonymity

To ensure confidentiality the data was kept confidential, under encrypted password and no other person had access to data except to supervisors. The researcher recorded field notes without the use of the personal identification information of the participants. In addition, the researcher ensured anonymity as an ethical principle for the study by making use of pseudo names instead of real names of participants so that the information remained anonymous. The findings were not linked in any way with the participants.

3.10.4 Harm to participants

The study was conducted in a conducive environment at worker offices and it did not pose any harm to the participants. The interview was conducted in a professional way and the questions asked did not in any way inflict discomfort among participants.

3.11 Dissemination of findings

The insights gleaned from this study will be distributed in three ways. First the finding s will be presented at a national and international conference, thereafter it will be published in a DHET

accredited journal. In addition the mini thesis will be catalogued by the University of Venda library.

3.12 Summary

The focus of this chapter was to describe the methods used to achieve the research objectives. The research methodology denotes the research design study setting, study population and the sampling, data analysis, data quality control and the research ethics.

CHAPTER 4

RESULTS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter focuses on the findings and presents the results. The findings are described in themes, subtheme, categories and subcategories. This purpose of the study was to investigate the health and safety risks amongst the Thulamela Municipality waste handlers in the Limpopo Province, South Africa. The study results are presented in line with the objectives as follows.

- Explore the work-related health and safety risk among the Thulamela municipality waste handlers.
- Describe the work-related health and safety risk among the Thulamela Municipality waste handlers.

The researcher collected data using an interview guide with the 18 participants from Thulamela Municipality. The researcher asked open-ended questions which allowed her to probe for more information from all participants. Data saturation occurred after interviewing 13 participants when the participants were no longer giving new information. However, interviews were continued until i stopped at participant number 18 to ensure data. All the interviews were conducted in the Tshivenda and Xitsonga languages as they were the languages preferred by the participants.

4.2. Participants' demographic information

This section provides participants' demographic information which they were requested to provide during the interview. Table 1, presents the demographic profiles of the participants. 18 waste handlers participated in the study and the participants' age ranged from 25-45 years.

Table 1: Demographic profiles of the participants

Participants	**Age**	**Gender**	**Marital status**	**Working experience**	**Position**	**Temporary / permanent employee**
Participant A	34	Female	Single	06 years	General Assistant	Permanent employee
Participant B	40	Male	Married	06 years	Driver Operator	Permanent employee
Participant C	36	Female	Married	06 years	General assistant	Permanent employee
Participant D	54	Male	Married	28 Years	Driver operator	Permanent employee
Participant E	27	Male	Single	06 Month	General Assistant	Temporary employee
Participant F	29	Female	Single	11 Month	General Assistant	Temporary employee
Participant G	36	Female	Single	06 years	Driver operator	Permanent employee
Participant H	49	Male	Single	06 Years	General Assistant	Permanent employee
Participant I	54	Female	Married	06 years	General employees	Permanent employee
Participant J	33	Male	Married	06 years	Driver operator	Permanent employee
Participant K	28	Female	Single	06 Month	General Assistant	Temporary employee
Participant L	32	Female	Single	06 Month	General Assistant	Temporary employee
Participant M	34	Male	Single	08 Months	General Assistant	Temporary employee
Participant N	34	Female	Single	08 years	Driver operator	Permanent employee
Participant O	53	Female	Married	06 years	General Assistant	Permanent employee
Participant P	42	Male	Married	06 Years	General Assistant	Permanent employee
Participant Q	53	Male	Single	04 years	General Assistant	Permanent employee
Participant R	33	Female	Single	11 month	General Assistant	Temporary employee

4.3 Presentation and discussion of the findings

The aim of the study was to investigate the health and safety risks amongst the Thulamela Municipality waste handlers in the Limpopo Province, South Africa. Data was analysed using a thematic analytical approach, which is detailed in the previous chapter. The data collected from the Thulamela Municipality waste handlers with regards to their health and safety risk is summarised in Table 2. One main theme, four categories and ten sub-categories were derived from the data analysis.

Table 2: Main theme, categories and sub-categories emerged from the findings

Main theme	**Categories**	**Sub-categories**
4.3.1 Health and safety risk among municipal waste handlers	4.3.1.1 Physical hazards	4.3.1.1.1 Lack of personal protective equipment 4.3.1.1.2 Muscular-skeletal disorders 4.3.1.1.3 Exposure to extreme weather conditions 4.3.1.1.4 Car accidents and Falling from trucks. 4.3.1.1.5 Noise from the waste trucks 4.3.1.1.6 Vibration
	4.3.1.2 Psychological hazards	4.3.1.2.1 Community harassment 4.3.1.2.2 Discrimination 4.3.1.2.3 Lack of training
	4.3.1.3 Biological hazards	4.3.1.3.1 Infectious disease from the contaminated wastes 4.3.1.3.2 Bites from insects and snakes
	4.3.1.4 Chemical hazards	4.3.1.4.1 respiratory problems

4.3.1 Main Theme: Health and safety risk among municipality waste-handlers

People who work as waste handlers are exposed to various work-related health hazards and safety risks. The Thulamela Municipality waste handlers described various factors that may put their health and safety at risk when doing their job on their daily basis. The following are categories that emerged from data analysis: physical hazards, psychological hazards, biological hazards and chemical hazards.

4.3.1.1 Physical Hazards

The duty of the Thulamela municipality waste handlers involves manually lifting heavy, door to door collection, loading refuse bags using either hydraulic lift or their physical strength. During the interview, the participants described how concerned they were about the health risks they are exposed to as they are doing their job on their daily basis. The following sub-categories were identified from the category: lack of personal protective equipment, muscular disorder and exposure to extremely weather condition (skin rashes, nose bleeding and eye problems).

4.3.1.1.1 Lack of personal protective equipment

The participants bemoaned the lack of personal protective equipment. The participants also complained that they are given only one uniform set, which includes hand gloves, a pair of trousers, a shirt and one pair of safety shoes. The participants complained that they work for five days and they have to repeat same uniform for the whole week. The findings further revealed when the participants lose one or both hand gloves, or if they got stolen, there were no replacements and they will have to tie the refuse plastics bags with bare hands. The study findings revealed that the participants do not receive dust masks regularly, to cover their noses, in order to protect themselves from dust and smoke. The participants also complained that even the dust masks distributed to them were not effective because they experienced respiratory difficulties and felt the smell during waste collections.

Participant M *said "We are not given enough uniform, we are only given one pair to use or the whole week, (shaking her head), just imagine the smell of the repeatedly clothes for five days without being washed, here we work with dirt and smelling things of which they might also get into contact with your clothes as you are busy lifting and emptying the dust bins into the truck"*

*Participant C said "it's very tough in this field, to tell you the truth, (quiet for a moment**),** sometimes we need to conduct our duty wearing refuse bags plastics on our hands as a replacement of hand gloves. We are only given one pair of gloves and if you lose it, it means that you have to steal from one of your colleagues or work without them. What if I got cut accidentally by a bottle or a jab from a syringe while collecting waste?"*

The findings show that the waste handlers receive insufficient personal protective equipment to protect themselves against health risk problems when doing their work on a daily basis. Working without proper personal protective equipment makes it difficult and exposes the waste collectors to different health risks. The literature indicates that there are various methods used to prevent injuries amongst waste handlers. These include personal protective equipment, personal protective clothing and safety warning. In the study conducted by Jerie (2016), it was reported that the waste handlers complained that the material used to make the dust mask to cover their nose against dust, bad smells and smoke were not effective because they experienced some respiratory problems during waste collection and waste burning. In the same study, it was further reported that some of the workers would rather operates without masks and mostly some waste handlers would not have masks because they are usually in short supply, which may also put their health at risk. UNEP (2013) argues that due to harsh economic experienced in most African countries including Sudan, the provision of occupational health services is limited, hence there are no finances to purchase personal protective equipment. In addition, proper infrastructure such as showers, sinks, soaps and clean running to use after finishing the shift. As a result, waste handlers wear the same personal protective equipment the whole week running the risk of contamination (UNEP 2013). While solid waste workers occasionally wear gloves, they are quickly worn out and rendered useless exposing them to needle punctures or glass cuts (Jerie, 2016). There is no doubt that these conditions expose them to bacteria, virus and toxic chemical and eventually affecting their health (UNEP 2013).

4.3.1.1.2 Muscular-skeletal disorders

During data collection it was revealed that the municipal waste handlers are experiencing muscular-skeletal disorders as a result of handling heavy containers, lifting, emptying the bins inside the trucks and walking for long distances collecting bags of wastes. The participants indicated that they experienced back pain as they spent more hours bending when collecting waste. Back ache was the most experienced ailment. The following verbatim quotes suggests that a waste handler suffers from musculoskeletal disorders.

Participant F said, "*You know what, every night when I go to sleep I can feel that I am very tired and I have a pain my back because of too much bending when collecting waste on the street".*

Participant L said that *"My whole body including knees and arms, is very tired after work because we will be running carrying plastic bags chasing a moving truck. We work under extreme pressure, in order to finish on time"*

Participant C said *"There is something strange about this job, as you are working you won't feel anything, but once you knock off and you are ready to go home, you will be dragging your legs as an indicator that you are very tired and you need to rest. I sleep like a log every day. My body would be very sore"*

The municipal waste handlers collect waste manually, which requires significant physical strength. Similar findings were reported by different studies around the world. A study conducted by Bogale, et al.,(2014) in Ethiopia, it was found that many of the participants have been troubled with muscular-skeletal symptoms such as joint pain and back pains. Similarly Dischrad (2017) observed that waste handlers experienced musculoskeletal symptoms and the study concluded that they were caused by shift work and manual handling heavy workload for long periods. Manual activities such as lifting, sorting, repetitive strain, twisting, loading and carrying heavy load are the common causes of muscular-skeletal problems among waste handlers (Rushton, 2003). In addition repetitive lifting, twisting and carrying causes fatigue, tendonitis, and musculoskeletal injuries of the feet, arms, shoulders, hands, lower and upper backs disorder (Ziaei, et al., 2018). This is supported by a study conducted in Iran which reported that municipal waste handlers complained about lower back pain, stiff neck, painful neck and shoulders which are all symptoms of musculoskeletal disorders. Similar findings were reported by a study conducted in Pakistan which suggested that waste collection which involves lifting was linked to back pain, stiff neck, swollen shoulders, joints pain and arms (Jayakrishna, et al 2013). In another study conducted in India similar symptoms such low back pain, elbow pain and wrist pain (Priyanka, & Kamble (2017).

A study conducted in Egypt by Abou-ElWafa, et al., (2012) on the prevalence of MSDs revealed that low back, then shoulders, neck, knees and thighs and elbows are the most frequently affected body regions among solid waste workers. In Denmark, the frequency of musculo-skeletal complaints among refuse collectors was two times higher than for the total Danish workforce. A similar outcome was reported in Taiwan where the risks of low back and elbow /

wrist muscular-skeletal complaints among refuse collectors were more than twice as high as those of their colleagues working in the office (Cointreau, 2006).

4.3.1.1.3 Exposure to extreme weather conditions.

The findings revealed that waste handlers are exposed to extreme weather conditions. They have to go to work when the sun is extremely hot or when there is heavy rain with lightning and thunder. The participants reported that they felt they were putting their health at risk because they were forced to go to their working points to collect waste no matter how hot the sun or whether or not it was rainy. The participants further indicated that they had to travel for long distances in the sun. This made them feel dizzy, experience unstoppable headaches, and skin itching. The participants further reported that they experienced nose bleeding when they were sleeping after work due to extreme high hot temperatures causing dryness of the mucous. The participants expressed concerns that they did not feel protected at all because two to three days after rainfall they would be suffering from flu as a result of working in a rainy weather without rain coats. They indicated that they were instructed to wear the plastic reuse bags in order to protect themselves against rain, which was also not ineffective.

Participant B said *"As you can see, today it is very hot (looking at the sun). Tell me, don't you think that working under that sun-light cannot put your health at risk? The way it is so hot, it is not normal, we get tired very easily and I might be putting my skin at risk of skin cancer".*

Participant F said "*You know what, working as a waste collector in this municipality is like you are a slave, we are forced to go to our working point even when there is heavy rain and lightning, and we will have no place to hide until the rain or lightning stops, because even when you sit under the truck you will be monitored to check If we are sitting down or still working, If we are found sitting it means that we going to be given a warning."*

Participant D said "*We work under extremely bad weather conditions, like now it's very hot and we are supposed to go back at work. I feel I'm putting my health at risk. It is better in the morning but after 12, the heat wave will be unbearable and we are supposed to be working. My duty is to collect waste, including picking up papers, so I end up getting a blurred vision as a result of spending lot of time looking at shiny things and white papers."*

Due to working under the extreme weather conditions, the participants complained that they experienced various health problems such as skin itching, rashes, headaches, eye problems, dizziness and flu. The researcher concluded that workers are vulnerable to skin health

problems, rashes, flu, and headache. Similar findings were conducted by Bogale, et al. (2014) who observed that the health problem of municipal waste handlers included skin problems, nose and eye problems, gastrointestinal problems, fatigue, headaches and allergies, as a result of working under extreme extremely weather conditions. In another study conducted by Robson, et al., (2012), revealed that the participants were not provided with the right weather clothing, such as rain coat, to wear in times of rain, long rain water proof boots, caps and work suits that cover their body and arms.

4.3.1.1.4 Car accidents and falling from trucks

The findings also revealed that the participants were being exposed to car accidents when they were on duty. The participants showed concern that the trucks that are used use air brakes which are not too reliable. This leads to unexpected accidents. They further mentioned that even when the driver is very careful with his driving, they are not sure whether the other drivers are careful too. One of the participants reported that he had twice been admitted to hospital as a result of a car accident while on duty. The participant indicated that they have to collect waste around the communities along gravel and tar roads. He pointed out that both road surfaces can be very difficult to drive on during rainy times. The findings also revealed that the participants believed that they were putting their lives at risk of falling from trucks as they stepped and held on the truck handles at the back of the truck on rainy days because the truck handles would be wet and slippery.

Participant J said "*The first risk you carry as you will be working, this truck uses air brakes; if they fail you might be involved in a car accident. I have been there (hospital) twice because of the accidents when I was at work, the first accident was when I was still working as a waste collector, not a driver, when I was holding on the back of the truck and then someone who was trying to overtake us came and hit me".*

Participant G said *"The compactor of the truck almost cut my toes as it was moving the waste in to the truck, and I was hanging from at the back of compactor tailgate".*

Participant E said *"You see, we are given points where we to start and finish waste collection, this job is done very fast, the only risk is that I might slip and fall as I will be jumping up and down the truck while it is moving. I might miss a step and fall."*

Similar finding were reported by Jerie (2016), that some of the roads, especially in Mkoba, Ascot, and Monomotapa's high density surbubs were rough and unpaved and hence posed

risks in the form of road accidents. Choobineh, et al., (2016) mentioned that due to lack of visible personal protective equipment, participants reported the risk of being knocked over by other cars as they are busy collecting waste around the street. Waste handlers usually jump up and down from the refuse truck to lift and throw in garbage bags. Accidents are frequent because they do not have the proper footwear, and as a result they fall off from the truck and that they work under pressure from the superiors (Ziaei et al, 2018). Pereira-de-Paiva et al (2017) also concluded that waste collectors are exposed to the risk of being run over by trucks and other hazards include animal attacks, especially dog attack, press, and amputations through equipment used at work.

4.3.1.1.5 Noise from the waste trucks

Another sub category which emanated from the study shows that waste workers work in busy streets where they are exposed to high levels of noise. This may induce early hearing loss in municipal waste handlers. The following extracts suggests that waste handlers are exposed to high levels of noise:

Participant G said "*We work in a busy street with many people and many vehicle I cant even here what my driver says we communicate with signs if I am not careful I can be knocked off by an oncoming truck"*

Participants said *"Where we work there is too much noise which irritates so much in such a way it affects our ear drums"*

This suggests that waste handlers work in busy streets where there is lot of traffic. Similar findings were reported in Zimbabwe and Brazil where noise has been blamed for causing most accidents which occurred among waste handlers (Jerie 2016; Pereira-de-Paiva et al 2017).In addition in China Liu et al. (2015) further propound that the large machinery used to dig, transport, and compact landfills can generate noise level higher than 85 dB. Similarly Kuijer and Frings-Dresen Stassen (2017) found personal noise exposure levels as high as 96.4 dBA among waste collectors in the Netherlands which induced hearing loss among waste workers. Ncube, et al, (2017) suggests that noise in municipal solid waste emanates glass and metal tins especially during emptying of metal bins on the metal floor of waste collection vehicles. Furthermore high working speed with regard to offloading of waste bins tended to produce a monotonous noise. Additionally, Jerie (2016) observes that, for informal waste workers, sources

of noise entail working closer to heavily frequented roads and other noise sources such as carpentry, metal work, and engineering workshops.

This suggests the need for waste managers, particularly in tropical countries, to consider rescheduling summer waste collection services for early morning hours or at night when temperatures are cooler and low and traffic volume low. Additionally, waste workers need to be encouraged to take regular breaks and rest in cooler shades where oral rehydration fluids can be given to refresh those (Ncube et al, 2017).

4.3.1.2 Psychological Hazards

Working as a waste collector has its psychological risks, it may result in depression and frustration. The findings of this study revealed that participants are harassed by people around the community that they collect waste from. The following sub-categories were identified from the category: community harassment, discrimination and lack supervisors support.

4.3.1.2.1 Community harassment

The findings revealed that municipal waste handlers are harassed verbally by the people along the town street where they will be collecting waste from. The participants expressed some concern that they were being sworn at by people who were drunk and they could not answer back as they feared that they might be physically attacked.

Participant A said *"We are not safe as we work here around the street, we come across drunken people and they will be swearing at us without provocation, and we are afraid that if we answer back we can be beaten".*

Participant C said *"Sometimes when we collect waste we come across drunken people, they swear at us, some of them threaten to beat us."*

Participant G said *"working as the municipal waste collector is not safe at all, as we are busy moving around with the truck, other drivers will be complaining about our work, swearing at us and obviously you cannot answer back because you don't know what will happen next, we also meet drunk people who say whatever they like about this job, this thing worries me a lot."*

The findings revealed that participants work in fear of being physically attacked by drunken people. WIEGO (2014) reported that municipal waste handlers are treated as a nuisance and

with disdain by people around the community. In Brazil waste workers continue to suffer from historical discrimination, with the devaluation of their work by society, government and employees, as well as precarious working conditions and a general lack of training (Pereira-de-Paiva, et al., 2017).

4.3.1.3.2 Discrimination

The study findings revealed that municipal waste handlers are not treated the same in terms of uniform distribution. The participants reported that in their municipality some waste handlers are permanent employees while some are working under contract. The participants contract complained that they were not given rain coats to protect themselves during rainfall when on duty while permanent workers had them. They further indicated that they were not given the dust masks to either cover their noses while working whereas permanent employees are given them. The participants also reported that this discrimination makes them feel reluctant to go to work because they were doing the same job but they were not given the same personal protective equipment. The findings also revealed that when the participants raised issues they were ignored by their seniors

Participant G said *"the other thing that I don't feel alright about this job is the discrimination within this place, when it's raining we are not given the rain coats or reflectors, it is only given to the permanent employee workers, they said us should use the refuse plastic bags to cover ourselves*".

Participant P added that "*we are given one pair of uniform here and when we send our complains that one pair of uniform cannot do for the whole week we get ignored, this is an indicator that we are not taken serious here".*

Participant A said *"sometimes I think it is better for me to quit, because even when we try by all means to raise our concerns to our senior, we won't get good answers, its either we are ignored or we're told that if we do not like this job, we should quit."*

The work place based discrimination that prevails at the municipal health workers various workplaces creates unnecessary stress. Byung, et al., (2016) observed that municipal waste handlers shy away of requesting personal protective equipment to their senior supervisors for fear of discrimination and not taken serious). In general municipal waste handlers around the world are looked down upon as a result they suffer from discrimination, emotional abuse and harassment form the society.

4.3.1.2.3 Lack of Training

The findings further revealed that the participants were continuing with their duties despite not being trained on the job and the important of using personal protective equipment/clothing. Therefore, they just work without proper knowledge. Participants further reported that if the employee is new, he or she just copied from the other employees who had been working before him or her.

Participant J added that *"I feel that, the municipal as a big organisations should hire a team that can strictly assist us in terms of health and safety education, because we just carrying on with our duties without any knowledge."*

Participant L said *"Umhh, in this job, honestly speaking there are no workshops or just even advice on how we should carry out our work in a safe manner. You as an individual just have to make sure that you work in such a manner that your health will be protected."*

Similar findings were also reported in Brazil whereby waste workers did not have knowledge about waste management because they were just hired as casual workers (Pereira-de-Paiva, et al., 2017). Education and training assist workers to improve the health and safety of workers (Robson, et al., 2012).

4.3.1.3 Biological Hazards

The other hazards related to solid waste collection including biological hazards. The findings revealed that municipal waste handlers spend many hours working at the dumping sites, where there are many flies and mosquitoes. The following sub-categories were identified from the main theme: bites from insects and snakes and Infectious disease from the contaminated wastes.

4.3.1.3.1 Bites from insects and snakes

The participants reported that due to lack of safety jackets they experienced mosquito's bites and contact with flies that had been eating rotten things.

Participant A said *"when working as waste handlers, we even work at the dumping site, so one thing that I see as a risk are the snakes that we see there. We see many different big snakes*

and you will find there is nothing that we can use to kill it. You will only be surprised when you are removing waste and when you see snakes, some can split their venom into your face or eyes and we don't have anything to protect our face."

Participant L said *"in the dumping site there are lot of flies and mosquitoes. We are getting bitten by mosquitoes every day when we go to the dumping site. There are also many dogs at the dumping site and this puts us at risk of getting bitten by them."*

Participant C said *"my main duty here is to collect wastes, I have once got cut by a bottle while discharging waste from the bins. We also struggle to breathe in this working situation because we collect even rotten dead dogs with worms."*

Similar finding were reported by Jerie (2016) who found that cases of snakes and insect bites were reported among waste handlers and this triggered allergic responses. This was exercabated by the fact that the workers had no gloves they were using bare hands (Jerie 2016). A study conducted by Ncube et al (2017) confirms that waste handlers are bitten by insects, cut by broken glass or razor blades and as a result they reported to suffer from a number of occupational health diseases.

4.3.1.3.2 Infectious disease from the contaminated wastes

The findings revealed that the participants feel unsafe when collecting waste without using appropriate personal protective equipment such as hand gloves. They mentioned they are afraid of being jabbed by the needles, syringes and cut by sharp objects such as razor blades, knifes and bottles. The findings also revealed that one of the participants was cut by a bottle on her leg as she was removing waste, while another participant indicated that she got a syringe jab on her hand. The participants reported that they fear that they might be infected by diseases such as HIV/AIDS through those sharp objects.

Participant A *said "Due to lack of hand gloves, many people here they tie refuse bags on their hands in order to protect themselves when collecting wastes, just imagine using a plastic on behalf of the gloves what if you get cut by a sharp bottle or stabbed by a used syringe and get the infections".*

Participant G said that *"The hand gloves that we are given are not protective enough because they are too short, the liquids might drop on your skin as you carry up the dirt container, this can put your health at risk".*

Participant C added that *"(Quiet a moment), sometimes we work without hand gloves and when we collect waste there is a section that we will have used syringe, if I get jabbed by a mistake, it means that I might get injured and also get infections."*

Participant D said "*I was once jabbed by a bottle while on duty as a result of working without hand gloves."*

The findings indicated that municipality waste handlers are exposed to infectious diseases and injury from sharp objects, such as bottles and knives as they work without proper personal protective equipment, such as hand gloves. The findings also revealed that the participants mostly work without safety boots and hands gloves, as they are given these once per year. In the study conducted by Decharat (2017), it was reported that municipal waste handlers also come into contact with dangerous items such as syringes and cotton bandages contaminated with blood and other body fluids, which can lead to infectious diseases. The UNEP (2013) observed that in South Sudan waste pickers were exposed to large amounts of health care waste such as bandages, syringes, needles, scissors and other hazardous waste hence workers were at risk of acquiring HIV/AIDS and Hepatitis. The risk of infection is heightened by the fact that most handlers carry the waste with bare hands exposing themselves to broken bottles, plates, empty tins and sharp objects (Mohammed & Latif 2014). The researcher further mentioned that the participants disagreed that hand gloves are adequately distributed amongst them. This makes the waste handlers to be without the proper essential instrument to discharge their duties in a sanitary manner and exposing them to risks of getting infected through jabs from razor blades and syringes (Mohammed & Lati, 2014). According to Laitinen & Rantio, (2016) "these are waste materials that contain nutrients and are often moist, thus providing a favorable environment in which micro-organisms can thrive". For example health care related waste contains pathogenic micro-organisms and poses risk of infection.

4.3.1.4 Chemical Hazards

Chemical hazard are characterized by physiological poisoning and dermatitis injuries. The findings revealed that municipal waste handlers were exposed to various chemical hazards. The study findings revealed that municipal waste handlers were worried about getting various respiratory problems such as asthma, tuberculosis, sneezing and cough problems as a result of

lack of affective dusk mask that they can use to cover their face during waste collections. The following sub-category was identified from the category: respiratory problems.

4.3.1.4.1 Respiratory problems

The findings also revealed that the dust masks that they were given to waste handlers were not regularly changed. The waste handler also complained that they were not effective because they inhale smell from the waste that they colleting.

Participant E *said "Eeh!! (Holding his cheek, our duty is to carry the dust bins which are sometimes broken and leaking and smelly, which means that once the liquid gets to drop onto our skin, there is a high possibility of experiencing health problems."*

Participant J said *"As we work for hours while inhaling dust, smelly things. We are indeed putting our health at risk of all diseases which goes along with diseases such as tuberculosis and respiratory disease."*

Participant G said "*The reason why I say my safety is at risk is that we work here without masks to cover our faces, going around inhaling the smoke from car exhausts and things that we burn at the dumping site. We sweep the roads and pour dirty staff in the trucks. Where do you think the dust is going? Obvious I am going to inhale it"*

Similar reports of respiratory ailments have been reported by previous studies. In Sudan UNEP (2013) observed waste handlers suffer from respiratory diseases since they are exposed to smoke coming from the dumping sites which triggers headache and fatigue. Rajapaksha et al, (2017), indicated that waste handlers who are regularly involved in handling waste are highly exposed to organic dust and bio aerosols which make them vulnerable to pulmonary infections such as asthma. In another study by Jerie (2016) they observed that large amounts of data are generated in landfills as a result waste handlers breathes large amount of dust which causes them to cough and have breathing problems. Nkosi (2015) observes that bad odour or smell which comes from the rotten waste also causes irritation to the respiratory system.

Binion & Gutberlet (2012), contend that exposure to chemicals is associated with anatomical poisoning and skin irritations or injuries, such as burns and respiratory diseases. Jerie (2016) finds that chemical exposure causes dermatitis, respiratory system inflammation, liver damage, and central nervous system disruption. The main routes of chemical absorption are through

inhalation, dermal contact and ingestion. Although chemical contaminants occur in solid waste in negligible quantities, they have serious health implications for solid waste handlers.

A study conducted in Ethopia has revealed that waste handlers exposed to chemical hazards in literature has been linked to blood cancers, skin infections, burns, irritations , allergies, respiratory ailments (Eskezia, et al., 2012). An epidemiological study revealed exposure to chemical has been linked to gastro intestinal, dermatitis, liver or kidney damage and brain damage (Jerie, 2016). Sarkar's (2003) study in India revealed that waste recyclers working in landfills had high levels of lead in their blood and the findings led researchers to associate solid waste work with increased bioaccumulation.

4.4 Summary

This chapter was about the discussion of the findings of the study. Raw data was analysed and reduced into categories, and sub-categories, in order to reflect the view on the health and safety risks among Thulamela municipality waste handlers when carrying out their duties. The findings further revealed that people who work as waste handlers are exposed to various work-related health hazards and safety risks. The physical risk which is associated with muscular-skeletal disorder as a result of pushing, pulling and carrying containers and working under pressure was identified as a major risk. The shortage of personal protective equipment (hands gloves, safety helmets, rain coats, overall uniforms, safety jackets and boots) was also identified as major risk and was associated with municipality waste handlers, exposing them to the risk of injuries and disease infections.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The previous chapter discussed the results and data analysis in relation to the health and safety risk among the Thulamela Municipality waste handlers in the Limpopo Province, South Africa. The discussion was compared to the literature from various authors in support or against the findings. This chapter outlined the summary, conclusion and recommendations based on the study findings.

5.2 Summary

This study was conducted in the Thulamela municipality, and the findings revealed that the participants are exposed to physical risks due to the nature of wok that they do on a daily basis. The participants are at risk of being physically injured as a result of working without the appropriate personal protective equipment.

The findings further revealed that participants are experiencing psychological hazards. In addition, they reported harassment, discrimination by their supervisors and lack of supervisor's support, as their major concern that drained them emotionally.

The research also show that the participants were at risk of getting diseases from infectious and contaminated waste, and were also afraid of dog and snake bites.

The findings also revealed that the participants were exposed to respiratory hazards due to lack of dust masks, the participants complained that they felt they were putting their health at risk of suffering from respiratory diseases, such as TB and Asthma, because of inhaling dust and contaminated air from the dumping site.

5.3 Conclusions drawn from the study

The study concludes that the municipal waste handlers are exposed to various work-related health hazards and safety risks. The municipality waste handlers were more concerned about the lack of personal protective equipment, ranging from hand gloves, sun hats, rain coats, overalls, work suits, safety reflective jackets and boots to keep them safe while collecting waste. The municipal waste handlers sometimes wore plastics refuse bags in an attempt to deal with the weather challenges such as rain. Plastic refuse bags were also used to protect the hands during shortage of gloves

The municipal waste handlers complained that they were experiencing muscular-skeletal disorders as a result of handling heavy containers, lifting, emptying the bins inside the trucks, working under pressure and walking for a long distance during litter picking.

The municipal waste handlers experienced health problems such as nose bleeding at night, regularly headaches, skin rashes and skin itches as a result of working under extreme hot weather condition. The findings revealed that the municipal waste handlers are exposed to occupational accident and injuries due to lack of induction training, standard speed limit for truck drivers and poor condition of their waste trucks.

The findings also revealed that municipal waste handlers are prone to various diseases from contaminated waste as a result of working without proper personal equipment (hand gloves and safety boots).

It was also noted that the waste handlers work in fear of being bullied and physically harassed by drunken people around the town and villages. Even though the temporary municipal waste handlers were given a uniform once per year, they felt discriminated by their seniors, as there were some personal protective (rain coats, reflectors and mask) which was only given to permanent waste handlers.

The findings further revealed that municipal waste handlers carried on with their work without safe working procedure training.

It was also noted that the participants spend some time working at the dumping site where they are being exposed to polluted air and dust.

5.4 Recommendations

The following recommendations were made based on the findings of the study.

5.4.1 Recommendations for Municipal waste handlers

It is recommended that the municipal waste handlers should wear personal protective equipment/ clothing while at work, as provided by employers, for the sake of safeguarding their health and for proper recognition. The use of personal protective equipment will significantly reduce their risk for occupational injuries and diseases.

It is also recommended that municipal waste handlers should take reasonable steps to ensure their personal safety and also the safety of fellow employees, waste handlers should also follow instructions given to them by their supervisors.

It is also recommended that municipal waste handlers should comply with occupational health and safety (OHS) act 85 of 1993 and its regulations, attend induction training and workshops in order to gain knowledge and understanding with regard to their job performance.

5.4.2. Recommendations for the municipality managers

The municipal management should conduct a risk assessment for the institution to minimise all health and safety risk within waste handlers.

The municipal management should ensure that waste handlers undergo routine medical check-ups in order to check if employees are in good health conditions to perform their duties and truck drivers should undergo medical fitness tests.

In order to improve the health safety condition for municipal waste handlers, the municipality must distribute suitable personal protective equipment (hand gloves, rain coats, safety reflective jackets, sun hats and boots) and some forms of overalls and worksuits, which are highly visible to reduce the risk of vehicle accidents.

The municipal should also appoint a qualified health and safety officer who will assist the municipality with OHS compliance, monitoring the workers to ensure that they are all wearing personal protective equipment.

Management should comply with the Occupational Health and Safety (OHS) Act 85 of 1993 and its regulations as stipulated.

The municipalities should also hold workshops and induction training programme which focus on capacitating the municipal waste handlers to acquire knowledge and skills relevant to their jobs and to take responsibilities on health and safety measures.

The municipality should have an Occupational health and safety policy (truck drivers speed limit policy, PPE policy, etc..) and safe working procedure for all employees, OHS policy and safe working procedures need to be approved by an Accounting officer (Municipal Manager) and adopted by Council.

Management should ensure that health & safety representatives and first aiders appointed within the institution are trained and capacitated.

In terms of the OHS Act Section 8, management should provide and maintain a workplace that is not harmful to the health of their employees.

5.4.3 Recommendations for future researchers

This study focused on the health and safety of the Thulamela municipality waste handlers in Limpopo Province South Africa. The findings revealed that the municipal waste handlers are exposed to various work-related health and safety risks on a daily basis. The present researcher therefore, recommends that further research be conducted in the other areas and organisations in relation to this topic, so that the findings can be compared, in order to improve the generalisation.

5.4.4 Summary

This qualitative study focused on the health and safety risks among Thulamela municipality waste handlers in Limpopo Province, South Africa. The study objectives were to explore work related health risks among Thulamela Municipality waste handlers, and describe the work-related safety risks among Thulamela Municipality waste handlers. In conclusion Thulamela Municipality waste handlers are exposed to various work-related health and safety risks in their everyday lives within their working environment. Recommendations were also made to

employees and management based on the various health hazards and safety risk in their working activities. Recommendations for future researchers to further research in relation to this study were also discussed in this chapter.

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APPENDICES

APPENDIX A: INTERVIEW GUIDE

TITTLE: HEALTH AND SAFETY RISKS AMONG THE THULAMELA MUNICIPALITY WASTE HANDLERS IN THE LIMPOPO PROVINCE, SOUTH AFRICA

Demographic information

1. How old are you?
2. What is your marital status?
3. What is your educational status?
4. What is your current position?
5. How long have you been working?

Central question: Please explain the health and safety risk that you experience in your day to day work?

Guiding questions

1. What are the factors related to your working environment which may affect your health?

2. What are the factors related to your working environment which may affect your safety?

APPENDIX B: LETTER REQUESTING PERMISSION TO CONDUCT RESEARCH

Thulamela Local Municipality
Vhembe District,
Limpopo, South Africa
16 February 2018
Dear Sir/Madam

RE: LETTER OF PERMISSION TO CONDUCT RESEARCH AT YOUR INSTITUTION

I do here by write this letter in application for permission to do research at the municipality. My name is Takalani Ngobeni. I am studying towards Master's Degree in Public Health at the University of Venda.

My study is titled, "Health and safety risks among the Thulamela municipality waste handlers in the Limpopo province, South Africa". The study seeks to explore and identify the health and safety risks and its causes among the waste handlers. The targeted people to take part in the study are the contract waste handlers, permanent waste handlers, driver of waste vehicles and office personnel working with and in the waste management department at the municipality.

Thus, this study is aimed at broadening the understanding the health and safety risks and hazards that face waste handlers with particular focus on how best they can be minimised. The identification of these hazards is just the beginning, fortunately in this case, workers and participants will be asked to suggest the best solutions on how to deal with this concern thus active participation in solving their own problems.

If granted permission I will systematically interview at randomly to consenting workers without interfering with their daily routine. Within two weks, data collection will be completed. In one of the days the I request to be able to conduct a group discussion with the consenting workers for a broader reflection of the causes of these concerns and how best they can be dealt with. Worker identity will not be obtained and only willing participants will be interviewed and included in the focus group discussions.

Your cooperation will be greatly appreciated and I am looking forward to your positive response

Yours faithfully

Takalani Ngobeni

Cell: 060 9760 363

APPENDIX C: INFORMATION LETTER

Title of the Research Study : Health and Safety Risks among the Thulamela Municipality waste handlers in the Limpopo province, South Africa

Principal Investigator/s/ researcher : T. *Ngobeni , (B.Tech Environmental Health*)

Co-Investigator/s/supervisor/s : *Dr N.S Mashau ,(PHD*)

Brief Introduction and Purpose of the Study:

Health and safety issues pertaining to workers are global concerns and major priority to the employers and government respectively. Workers in general across industries are faced with various health and safety risks. Waste handlers are more at risk of health hazards than other workers globally. This study seeks to explore the health and safety risks among the waste handlers within the Thulamela Municipality, Limpopo province,

Purpose:

To investigate health and safety risks among the Thulamela Municipality waste handlers in the Limpopo Province, South Africa

Outline of the Procedures:

A qualitative approach will be used; the researcher will make use of individual interview to collect data from the municipal waste handers. An interview guide with open-ended questions will be used during data collection. Waste handlers will be allowed to use Venda and Xitsonga languages, which will allow them to fully express themselves. An estimated time of 40-45min will be spent during data collection. The researcher will make sure the interviews are collected during lunch time at the Thohoyandou Town Hall for waste handlers. Techniques such as field notes, observation, audio tape, interview guide will be used during data collection.

Risks or Discomforts to the Participant:

No samples (bloods) will be taken during the study.

Benefits:

Benefits will be achieved from the study, because waste handers will gain knowledge and information. The findings from the study may be published in peer-reviewed and accredited national and international journals as well as presented at seminars and conferences.

Reason/s why the Participant May Be Withdrawn from the Study:

The researcher will take the responsibility of making the waste handlers aware that their participation is voluntary. Participants will not be deceived into participating in the study andmay withdraw if they feel like doing so.

Remuneration:
Participation is voluntary, no remuneration will be given.

Costs of the Study:

No costs will be required /covered or given during the study

Confidentiality:
Information provided will be treated with confidentially and only the researcher and supervisors will have access to the data; the tape/Audio used will be kept in a safe place where no one can reach them, and the use of pseudo names will help ensure anonymity.

Research-related Injury :

Participants will not be compensated for research related injury

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher (tel no.060 976 0363), my supervisor DR Mashau N.S (tel no.082 458 4689) or the University Research Ethics Committee Secretary at 015 962 9058. Complaints can be reported to the Director: Research and Innovation, Prof GE Ekosse on 015 962 8313 or Georges Ivo.Ekosse@univen.ac.z

APPENDIX D: CONSENT FORM

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Ngobeni.T, about the nature, conduct, benefits and risks of this study
- I have also received, read and understood the above written information (Participant information sheet) regarding the study.
- I am aware that the results of the study, including personal details, will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerized system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant	Date	Signature
.....	.....	.....

APPENDIX G: INTERVIEW TRANSCRIPT. P J

P J**= Participant J**

R= Researcher

DEMOGRAPHIC INFORMATION

R= How old are you?

P J said “I am 33 years old”

R= Are you married?

P J said “Yes”

R= What is your educational status?

P J said “I have passed grade 12”

R= What is your current position?

P J said “driver operator”

R= How long have you been working?

P J said “I have been working as a driver for 06 years now”

R= are you hired permanently or temporarily?

P J said “I’m a permanent employee

CENTRAL QUESTION

R= Can you please explain the health and safety risk that you experience in your day to day work

P J said “There are lot you that can say as you are working as the driver operator, ummm, you are working with dirt from different things, which the compactor has carried, they have different smells, meaning you will be inhaling that smell. Sometimes it will depend on your heath. We are required to work overtime and its very tiring due to the fact that we sometimes have to knock off late.”

R= yaa,

P J said “we are not only affected by the smell of the dead things, even the smoke from our trucks and other vehicles on the roads also affect our health, within our municipality we have old truck that releases smoke.”

R= ok,

P J said even when we go to landfill side to dump waste, the place is very smelly and we are expected to go directly inside and dispose waste. Not only waste affects our health, due to the fact that some of the trucks are old, there’s also noise that is released by those trucks.

R= Tell me more about the safety risk within your workplace

P J said “**umh**, you are not safe at all in this position as a driver operator. Sometimes pedestrians will be walking on the streets which requires the driver to be more observant. People and other vehicles are not patient with you during waste collection, they are so impatient. Sometimes people will start swearing at you, meaning that if you can answer back, your life might be attacked. This is the first thing I see as a risk, we meet lot of drunk people who don’t even mind their language when they talk to us. I feel that I am not safe at all, even the people that I will be working with I can see they also don’t feel safe by the way people are treating them or the way they speak bad about the municipality. We can end up being attacked emotionally, more especially when collecting waste here in town and within households”

R= hmm

P J said “on the gravel road, what really affects our health mostly are the humps, you feel it after work that your body is sore, though I am not really sure what it is but I can feel after work that something is wrong in my body, on the road. This truck that we are using uses air brakes, and the municipality didn’t give us speed limits , we using the roads speed limits, meaning that there is a possibility of brakes failure and you might find yourself in a big accident. When it is raining we continue to work and waste handler’s general employees will be riding behind the trucks without rain coats and that employee is at risk because there is a possibility of slipping and falling because the steps and truck handles will be wet.”

R= Ok

P J said “we drive and travel long distance far from the office with employees on a truck, so if something happens on the road you are left stranded”.

R= omething happens on the road like what?

P J said “something like car accident, or injury of other employees and we are not trained as first aiders if we come across some minor injuries, also we don’t have first aid box inside our trucks”.

R= have you ever experienced any injuries or someone in your truck got injured?

P J said “**ehh**, as for me yes, I have been in an accidents twice and that has happened when I was at work, where I had to be taken to a hospital.

R= can you explain those accident?

P J said “The first accident was when I was still working as a waste collector, not a driver operator when I was holding on the back of the truck and someone was trying to overtake us and hit me”

R= Tjo

P J said “It is very risky when you are holding on a truck during waste collection anything can happen to you”.

R = what can happen

P J said “you get tired by holding on at the back of a truck for a long distance where even your muscles and bones get tired”

R= ok

P J said “We are not even trained on how to ride that truck while collecting waste and management expect us to be physically fit to run.

R=really

P J said “**Uhmm**, in this job, honestly speaking there is no advice we are given because even those from the health workers do not come to us and give us some tips or advice, meaning that you as the worker should work and ensure that you protect yourself”

R= is there anything that you are given by the municipality in order to protect yourself?

P J said “yaa we are given a dust mask, it is the only thing that we are given daily, but uniforms are given maybe once or twice a year and sometimes sizes is a serious problem, where you can find yourself without a protective clothing that fits you.

R= Yaa

P J said “The other problem is that there is no one monitoring or checking if we are wearing them or not. They get torn and do not get replaced, but we are given dust masks every day. In our municipality we do not have a person working with OHS recently, the one we used to have had resigned.”

R= What do you think the municipal can do in order to minimise the risk?

P J said “I feel that, the municipal as a big organisations should hire a team including an OHS officer that can strictly assist us in terms of health and safety education, induction and training, because we just carrying our duties without any knowledge.”

R= Mhh

P J said “This can assist in making our work less risky. The other thing is there should be workshops that can maybe select certain people to be offered a first aid training, so that we can get assistance on time, in case anything happens especially drivers”

What is your motive for going to work even though there are such risks in your workplace?

P J said “**Ahh**, by nature I am that person who loves working, I love my job and I enjoy rendering services to our communities by collecting waste”

R= Is there any other risk you can mention concerning the truck you use?

P J said “what I can say is that the sound of the truck will ends up affecting our hearing, we spend lot of hours going up and down with this truck making a loud noise”

R= You have indicated that you have twice been in an accident while on duty, how did the accident affect you?

P J said “**Ehh, ei**, I can’t really say it, but what I know is that I was hit by a car and ended up being in hospital and someone from OHS came and attended me and then I got discharged

with a report saying that I didn't sustain any damage internal or external injury, it was just anxiety"

R= Mhh

P J said "I was angry with the way colleagues treated me, I was not given enough support, but then I have accepted that It has happened, now I am fine."

R= when you are working what are environmental exposure you experience?

P J said "tjo tjo tjo tjo **(shaking head),** the sun is burning us like nobody's business"

R= mhh

P J said "As you can see, it is very hot now. After 14h00 we are expected to go back to work at our working points until 17h00 pm"

R= Yaa

P J said "Yes and we are exposed to extreme weather without water to drink or cap to protect us against the heat, which means that I can collapse anytime or my eyes can be damaged"

R= okay, so, since you are working under this heat, are you allowed to rest in the shades or knock off early?

P J said "no, never, by who? (eyes wide open and shaking the head), there is no sitting down here and you will be monitored to check if you're working or not"

R= Okay

P J said that "every day when i leave here it's either my head will be aching because of the heat or I will be feeling exhausted. Working in this area is too bad for our health"