ASSESSMENT OF THE USE OF PERSONAL PROTECTIVE CLOTHING AMONG HEALTH CARE WORKERS IN SELECTED HOSPITALS OF VHEMBE DISTRICT IN LIMPOPO PROVINCE, SOUTH AFRICA.

BY

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UNIVERSITY OF VENDA

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DECLARATION

I, **Cecilia Mukhawa**, declare that the dissertation entitled ***'Assessment of the use of protective clothing among health care workers in selected hospitals of Vhembe District in Limpopo Province, South Africa***', that I am submitting, is my own work, contains no section copied in whole or in part from any other source unless explicitly identified in quotation marks and with detailed, complete referencing, and has not been submitted for another degree at this University or any other institution.

Signature **Date**

Cecilia Mukhawa 30/05/2019

DEDICATION

This study is dedicated to patients and all nurses.

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ABSTRACT

This study was carried out to assess the use of protective clothing among health care workers in selected hospitals of Vhembe District in Limpopo Province, South Africa. Protective clothing is the corner stone of health care facilities and it remains the most cost effective measure which is currently available in public health intervention. Although personal protective clothing is one of the best lines of protection against hazardous exposures, many healthcare workers either shun this protective apparel or do not wear it in an appropriate manner at the appropriate time. The purpose of the study was to assess the use of protective clothing of health care workers in selected hospitals of the Vhembe District, in the Limpopo province of South Africa. The study followed a quantitative approach using a cross-sectional design. The population comprised of all health care workers in purposefully selected hospitals and the sample was 205 health care workers who were 21 years and older. A questionnaire was self-designed in English, translated into Tshi-Venda, Se-Sotho and Xi-Tsonga languages. Data was collected by the researcher in selected hospitals of Vhembe District. The statistical package for social sciences (SPSS version 25) was used to analyse the collected data. Validity and reliability were ensured. Permission to conduct research was obtained from the University of Venda Higher Degree Committee, Department of Health in Limpopo Province for Ethical Clearance, and the institutions where the study was conducted. The use of protective clothing among health care workers was found to be relatively low (8, 3%) probably due to unavailability of protective clothing in the hospitals, allergic reactions and ignorance. Lack of knowledge regarding the use of protective clothing could also explain the low yield of the detected cases for not using protective clothing while on duty in this study. Based on the findings, the study conclusions and recommendations were that all health care workers should follow the stipulated policy on protective clothing and periodic awareness campaigns to be held to conscientise workers on the importance of wearing personal protective clothing.

Key words: Assessment, use, protective clothing, health care workers.

LIST OF ACRONYMS

HIV	Human Immunodeficiency Virus
HBM	Health Belief Model
HBV	Hepatitis B Virus
HCA	Health Care Acquired infection
HCV	Hepatitis C Virus
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus
MRC	Medical Research Council
NH's	National Health Service
NIOSH	National Institute for Occupational Safety and Health
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Administration
PC	Protective clothing
RSA	Republic of South Africa
TB	Tuberculosis
WHO	World Health Organization
UK	United Kingdom
SA	South Africa
USA	United State of America

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CHAPTER 1

OVERVIEW OF THE STUDY

1.1 INTRODUCTION AND BACKGROUND

The use of protective clothing (PC) among healthcare workers is one of the most effective, safe and efficient health interventions in the workplace (Loosli, 2012:90). In this study, (PC) is the specialized clothing or equipment worn by employees for protection against health and safety hazards. Protective clothing is designed to protect many parts of the body, such as eyes, head, face, hands, feet and ears. The Occupational Health and Safety (OHS) medical report in the Republic of South Africa (RSA) indicated that about 50 thousand deaths are reported globally; the statistics from Occupational Health and Safety between the year 2000 until April 2017 shows an increase number of deaths from occupational health diseases from 40% to 67% respectively, including 30 thousand deaths among health workers co-infected with occupational health diseases due to negligence of wearing protective clothing in the workplace (Loosli, 2012:91).

In one of the selected hospitals of Vhembe District in the Limpopo Province, South Africa, there seems to be a high number of sicknesses leading to absenteeism of employees, and these employees were found not to be wearing protective clothing while on duty. According to the Department of Health, Limpopo Province (2012: 213) Vhembe District, the statistics of occupational health disease indicated a high rate of absenteeism in hospitals. Among the reasons, there were those suffering from asthma, bronchitis, and tuberculosis.

Failure to use protective clothing represents a risk to both patients and healthcare workers (HCWs). A lack of access to protective clothing (PC) can contribute to reluctance to volunteer in a treatment centre (Lehman, Herm, Baron & Gerick, 2012:457). However, organisations, such as World Vision, are tasked to supply HCWs

with the PC required (World Vision, 2015:332). Requirements of provision of protective equipment are laid down by Regulation under the Factories Act no 98 of 2007. Knowing more about the experiences of occupational health diseases will enhance health care workers to use protective clothing effectively.

In the United Kingdom (UK), a study by Lehman, Herm, Baron and Gerick (2012:809), on knowledge of protective clothing, showed that occupational health diseases such as asthma, bronchitis, and tuberculosis accounted for 85% of illnesses in 2007, with about 23,000 cases significant enough to cause permanent hearing problem. Each day, about 2000 United States (US) health care workers have a job related eye injury that requires medical attention. Similarly in South Africa (SA), occupational health diseases such as hearing and visual problems have developed into most of the worst sicknesses in the country (WHO, 2012:99).

The use of clothing among health care workers has to be known and practised effectively especially now that there may be co-infection with HIV and AIDS (Hutchinson, 2013:901). Health care workers who get infected from occupational health diseases often experience many health challenges and become sick and absent from duty. Protective clothing (PC) is specialized clothing worn by health care workers for protection against infectious agents. PC prevents contact with an infectious agent or body fluid by creating barrier between the potential infection and nurses. The component of PC includes gloves, gowns, shoe, head cover, and masks (PC at Work Regulations, 2011:68).

Health care workers who are exposed to needles in their clinical activities are at increased risk of acquiring needle stick injuries, which may lead to serious or fatal infection with blood-borne pathogens, such as hepatitis B virus (HBV). Health care workers come into contact with various groups of people from all walks of life. Act no102 of 2010, outlines the general duty of employers to protect staff at work and implement safe systems, while Management of Health and Safety at Work Regulations (2013:212) require employers to carry out risk assessment (Sepkowitz, 2013:213).

According to the institution of medical report in Singapore (Craig, 2011:119), there was an outbreak of severe acute respiratory syndrome, with 238 probable cases with 33 deaths due to lack of using protective clothing among health care workers. Healthcare workers who spend the most of their time transferring, bathing and dressing patients, have the highest rates of musculoskeletal injuries (Nelson, 2011:212; Steinke & Stemmer, 2013:123; Deliver, 2012:99). More than two thirds (67,8%) of health care workers do not wear eye protection while assisting other health care workers during procedures, although it is possible to prevent or reduce healthcare worker exposure to these hazards. Employers are responsible for providing a safe and healthful workplace for their employees. The use of protective clothing is an essential measure for people responsible for care, treatment, transport, preventive measures and decontamination, not only for their own safety, but also for that of their environment (Taylor et al., 2012:174; Koradeck & Furnham, 2013:132).

The primary role of protective clothing is to protect staff and reduce opportunities for transmission of microorganisms in hospitals (Welman, Kruger & Mitchell 2005:122-125). Over the past 20 years there has been a trend to eliminate the inappropriate wearing of aprons, gowns and masks in general care settings because of a lack of evidence that they are effective in preventing healthcare acquired infection (HCAI) (Welman, Kruger & Mitchell 2005:221).

1.2 PROBLEM STATEMENT

The researcher is a professional nurse at a local hospital in Limpopo Province. During her day to day activities she observed that there seem to be high number of sicknesses in the units leading to absenteeism. At another hospital employees were found not to be wearing protective clothing while on duty as required by the Occupational Health and Safety Regulation No.42. According to the Department of Health, Limpopo Province (2012:213), the Vhembe District statistics of occupational health disease absenteeism of employees indicated a high rate in hospitals. Among them, some were suffering from

pneumonia, asthma, bronchitis, tuberculosis and other contagious illnesses. An employee in one of these hospitals, she also observed employees suffering from occupational health diseases, such as bronchitis and allergic reactions, in spite of the government having provided PC to employees. Absenteeism seemed to be due to diseases caused by non-use of protective clothing. Below, Table 1.2.1 indicate hospital facilities in Vhembe District with high number workers sickness due to Occupational health Diseases. The researcher therefore sought to find out the reasons for non-use of protective clothing selected hospitals of Limpopo Province.

Table 1.2.1: Number of health care workers sickness per facility (%) across Vhembe sub-district, 2014-2017.

Sub-district	Facility	Data element name	2014	2015	2016	2017
Makhado	Louis Trichardt Hospital	Number of sicknesses	23.5%	23.8%	24.0%	24.2%
Thulamela	Donald Fraser	Number of sicknesses	17.7%	17.9%	18.1%	18.5%
Thulamela	Tshilidzini (Regional Hospital)	Number of sicknesses	20.2%	21.1%	21.5%	22.0%

Source: DHIS data file 2016

Between 2014 and 2017 there was a fluctuation in the ratio in facilities in Vhembe District, according to DHIS data 2016.

1.3 RATIONALE OF THE STUDY

A study by Wynn (2015:678) regarding knowledge of protective clothing, its complications and management in Durban, South Africa in 2012, recommended that further studies should be done to assess the use of protective clothing in other provinces among health care workers in the workplace. Studies related to non-use of protective clothing were found to be limited in South Africa (Mokoka et al, 2012:319 & Lewin, 2012:99).

1.4 SIGNIFICANCE OF THE STUDY

Health workers who perform their duties in hospital settings without wearing protective clothing face many challenges of suffering from occupational health diseases which lead to sickness, absenteeism and early retirement. Recommendations from the study may assist the Department of Health to revise policies regarding protective clothing. The Department will benefit, because the findings may be used to enforce policy makers from national to keep employees updated. The results of the study may benefit the employer because if employees' rate of absenteeism is reduced, quality service will be provided. Findings from the study may have benefit to health workers in encouraging wearing personal protective clothing while on duty so that they may not suffer occupational health disease and also to minimize sickness and absenteeism. Patients may also benefit from the study as there will not be transmissions of diseases from health workers to patients, as well as from patients to health workers.

1.5 PURPOSE OF THE STUDY

The purpose of this study was to assess the use of protective clothing among health care workers in selected hospitals of the Vhembe District in the Limpopo Province of South Africa.

1.6 OBJECTIVES OF THE STUDY

The objectives of the study are to:

- Determine the use of protective clothing among health care workers in the Vhembe District Hospitals.
- Describe the perceived challenges of the use of protective clothing faced by health care workers in the Vhembe District Hospitals.

1.7 RESEARCH QUESTION

Why are health workers of selected hospitals of the Vhembe District in the Limpopo Province of South Africa not wearing protective clothing while performing their duties?

1.8 THEORETICAL FRAMEWORK

1.8.1 The Health Belief Model

This study was guided by the Health Belief Model (HBM). A theoretical framework is a group of related ideas that provide guidance to a research project or business endeavour. The appropriateness of a theoretical framework that a marketing department is using to promote its corporate and product image to the consuming public can be an important determinant of its ultimate success (Polit & Beck, 2011:155). Based on the model, Willington (2013:12), states that the likelihood that the individual will take action to prevent sickness depends on their perception that they are personally vulnerable to the actions; the consequences of the condition would be serious, the precautionary behaviour effectively prevents the condition and the benefit of reducing the threat of the condition exceeds the cost of taking action (Beckerman, 2013:56).

The Health Belief Model also addresses the relationship between people's beliefs and behaviours. It provides a way to understanding and predicting how clients will behave in relation to their health and how they will comply with health care therapies.

1.8.1.1 Perceived susceptibility

Personal risks are one of the most powerful perceptions in promotion of people to adopt healthier behaviours. The greater the perceived risk, the greater the likelihood of engaging in the behaviour to decrease the risk. Perceived susceptibility motivates health workers to use personal protective clothing. It is only logical that when health workers believe that without wearing protective clothing while on duty are at risk of getting sick, they will be more likely to do something to prevent it from happening. Unfortunately, the opposite also occurs when health workers believe they are not at risk or have a low risk of susceptibility, unhealthy behaviour tends to occur. Perception of increased susceptibility or risk is linked to healthier behaviour and decreased susceptibility or risk is linked to unhealthy behaviour (Mosby & Potter, 2013:23).

1.8.1.2 Perceived benefit

The construction of perceived benefit is a health worker's opinion of the value or usefulness of the new behaviour in decreasing the risk of developing the disease. Perceived benefit plays an important role in the adoption of secondary prevention behaviour such as screening for occupational health disease. Among health workers, those who perceive a benefit from occupational health disease screening for early detection are more likely to undergo screening than those who do not see screening as having benefits (Nolan & Sakraida, 2013:133).

1.8.1.3 Perceived barriers

This is an individual's own evaluation of obstacles in the way for him or her to adapt to a new behaviour of the constructs. Perceived barriers are the most significant in determining behavioural change in order for a new behaviour to be adopted. Health workers had to use personal protective clothing while on duty more effectively. This enables barriers to overcome the new behaviour to be adopted trying to increase occupational health disease screening (Stardom, 2013:112).

1.8.1.4 Self-efficacy

Efficacy is the belief in one's own ability to do something. People generally do not try to do something new unless they think they can do it. If someone believes a new behaviour is useful, but does not think they are capable of doing it, perceived barriers are that it will not be tried. The Health Belief Model is the most commonly used theory in health education and health promotion (Karen, 2012:104).

1.8.2 Application of the Health Belief Model

Based on the Health Belief Model, the researcher found it imperative to outline that health workers who perform their duties without wearing protective clothing are susceptible to get affected with illnesses, which result in suffering from occupational

health diseases. There is a lack of policies and workshops that have a strong impact on using protective clothing among health workers. The model is useful for determining the main aspects that might influence positively or negatively the health workers uptake of occupational health disease screening and predicts the adoption and maintenance behaviour (Montgomery, 2013:98).

1.8.3 Reason for choosing the Health Belief Model

The Health Belief Model was selected as the conceptual model for the study because of its focus on individual perceptions about illness, their beliefs about actions related to prevention of the disease, and how these factors affect their health actions. The model emphasizes individual health beliefs, and can be used to explain and intervene in occupational health disease screening behaviour. A number of health belief model variables are believed to influence health care workers for occupational health disease screening beliefs and practices such as perception of susceptibility and perceived benefits and barriers.

The model claims that health care workers are more likely to participate in health promoting behaviour if they believe they are susceptible to a health condition and that the condition is serious. An increase in perceived susceptibility and severity has been linked to an increase in occupational health disease screening. The model focuses on prevention and asymptomatic factors, such as occupational health disease and early detection (Stanhope & Lancaster, 2004:312).

1.9 DEFINITION OF CONCEPTS

- **Protective clothing:** According to Loosli (2012:90) protective clothing is a specialized clothing or equipment worn by employees for protection against health and safety hazards. Protective equipment is designed to protect many parts of the body, such as eyes, head, face, hands, feet, and ears. In this study,

protective clothing would mean clothing required to shield or guard the wearer from infections while engaged in employment.

- **Health:** The World Health Organisation (WHO, 2013:89) defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. In this study, health would mean the state of being free from illness or injury.

- **Health care worker:** According to Loosli (2012:94), a health care worker is someone who works in the hospital or health centre in the provision of what is necessary for the health, welfare, maintenance, and protection of someone or something. In this study, health care worker would mean all people delivering health care services, including students, laboratory staff, nurses, medical practitioners and occupational health and safety.

- **Hospital:** The Oxford Advanced Learners Dictionary (2013:1109) defines a hospital as an institution providing medical and surgical treatment and nursing care for sick or injured people. In this study, hospital would mean a place where sick or injured people are given care or medical treatment.

1.10. SUMMARY

This chapter outlined the introduction and background, the purpose, the rationale, the significance, purpose of the study, objectives, research questions, theoretical framework and definitions of concepts.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter addressed the background research problem, aim and significance of the study, definition of key concepts and foundations of the study. This chapter describes the literature review conducted for the study. A literature review is a systemic organized written source relevant to the topic in order to identify and retrieve possible gaps in the existing body of knowledge. It involves finding, reading, understanding and forming conclusions about the published research and theory, as well as presenting it in an organised manner (Burns & Grove, 2009:96). Akinsola (2005:219) defines a literature review as an extensive, systemic, and critical review or examination of all relevant publications to the topic being investigated.

Historically, the local health department did not have extensively developed protective clothing. For most local health departments, either no such programs were in place or the programs focused only on protection against tuberculosis. Today, protective clothing is the cornerstone of health care facilities, and it remains the most cost effective method which is currently available in public health interventions. Although personal protective clothing is one of the best lines of protection against hazardous exposures, many healthcare workers either shun this protective apparel or do not wear it in an appropriate manner at the appropriate time. Using protective clothing as an infection control measure lessens the exposure and transmission of infectious diseases.

This literature review consists of one main topic and its sub topics, which are: challenges faced by health care workers on non-use of protective clothing, improper types of protective clothing, lack of training and awareness about the use of PC amongst employees, and reaction of healthcare workers to PC.

2.2 CHALLENGES FACED BY HEALTH CARE WORKERS ON NON-USE OF PROTECTIVE CLOTHING

2.2.1 Improper types of protective clothing

The non-use of protective clothing is a serious challenge among health care workers across the country, as the health status of employees leads many to absenteeism from duty, and others end up losing jobs due to excessive sickness or death. The employers are to organize and analyse the data so that it may be efficiently used in determining the proper types of protective clothing required at the workplace. The employers have to be aware of the different types of protective clothing available and the levels of protection offered. It was found that many female health care employees are facing challenges of inappropriate sizes of protective clothing which are provided at their workplaces, whereas others do not have them at all (Lehman, 2012:58) .

According to Wynn (2015:679), as manufacturers continue to develop protective clothing that can reduce the job-related constraints, healthcare institutions and individual healthcare workers need to improve their adherence to appropriate protective clothing use. Healthcare employers need to provide a work environment that values worker safety, including provision of personal protective clothing that is effective against the hazards faced in the healthcare workplace. In turn, healthcare workers need to take responsibility to properly use PC, and managers should ensure that the staff members they supervise also make proper use of PC.

According to Sepkowitz and Holguin (2013:502) all protective clothing and equipment should be of safe design and construction, and should be maintained in a clean and reliable fashion. Employers should take the fit and comfort of protective clothing into consideration when selecting appropriate items for their workplace. Protective clothing that fits well and is comfortable to wear encourages employees to use them. Most protective devices are available in multiple sizes and care should be taken to select the proper size for each employee. If several different types of PC are worn together, make sure they are compatible. If PC does not fit properly, it can make the difference between

being safely covered or dangerously exposed. It may not provide the level of protection desired and may discourage employee use (Sepkowitz & Holguin, 2013:501).

In Canada, a study by George Miller (2012:116) indicated that there already was a short history of people not wearing surgical masks, even though they were available, creating a culture of casualness among the health workers. Other officials stated that the air was safe to breathe, which undermines the success of any effort to get health workers to wear surgical masks when performing their duties. The nature of the respirators themselves was an impediment. Not only can they be uncomfortable to wear, especially when not fit-tested, but the design itself did not allow people to communicate with one another; important if a first responder has to warn others of potential dangers in the work place.

According to a study done by Pear (2011:13), the effect that occupation may have on a worker's health is dependent on the exposure (expressed quantitatively) to relevant agents, and on host factors. Taking a history is often very important in identifying relevant exposures and linking them to ill-health. The concept of ‘cumulative exposure’, in other words, a quantitative measure of the intensity of exposure and the duration of exposure is important, since generally it is the main determinant of risk. Health may be harmed by occupational exposures in many different ways, and practically any organ system can be affected. Lee (2012:14) maintains that if a hazard assessment indicates a need for full body protection against toxic substances or harmful physical agents, the clothing should be carefully inspected before each use, it must fit each worker properly and it must function properly and for the purpose for which it is intended.

In Tanzania, a recent survey released by Kimberly-Clark Professional (2013:101), 89% of safety professionals said they had observed workers not wearing safety equipment when they should have been and 29% said this had happened on numerous occasions, problem being incorrect sizes of personal protective clothing where it can also lead to health workers being exposed to infections, for example, if the gloves are bigger than a health worker’s hands it can lead to contact of body fluids or blood from the patients.

The results of a longitudinal study conducted by Mesh, Kappor and Hutchinson (2011:119), in Sri-Lanka showed the reasons for such high levels of noncompliance. Of those respondents who observed protective clothing noncompliance in the workplace, 69% said the primary cause was health workers thinking that protective clothing was not needed. This was followed by protective clothing being uncomfortable, too hot, a poor fit, not available near the work task, and unattractive-looking. The top strategies taken by safety managers to encourage greater PC compliance were: improving existing education and training programs (61%) and increased monitoring of employees (48%), as well as purchasing more comfortable PC tying compliance to individual performance evaluations, purchasing more stylish PC, and developing incentive programs.

In the Limpopo province in South Africa, a study by Garg and Tjissen (2013:97) reported that health care workers face Occupational Health and Safety challenges related to the size and fitting of personal protective clothing that they use. Most of the health care workers who are experiencing these challenges are women, as they indicated that most of the protective clothing is designed for the male body structure, such as theatre gowns and trousers. Women reported having been diagnosed with various types of illnesses, such as ear infections and headaches. They also reported ailments such as back, joint, shoulder and abdominal pains, which are musculoskeletal disorders associated with labour-intensive tasks, coupled with prolonged standing involved in the hospital, as well as sore eyes, which they related to poorly fitting safety eye goggles, that could allow exposure to body fluids and blood. The study consistently report that women differ from men in terms of anthropometry, but the majority of available PC are designed for male workers, resulting in female workers being unprotected and unable to perform their tasks efficiently.

2.2.2. Lack of training and awareness about the use of PC among employees.

It was found that most health facilities are not conducting workshops regarding the use of protective clothing which results in non-compliance of the use of protective clothing among health care workers while on duty. Most of health care workers simply do not wear PC, and mostly this is due to lack of knowledge about the importance of protective clothing. The employer should become aware whether the employees are complying on the use of protective clothing or not so that training or workshops should be offered after identifying problems which employees experience due to not using protective clothing while on duty (Lehman, 2012:56).

Moline (2011:112) found that in some health facilities of South Africa, health care workers were wearing surgical masks on their chins. They did not know what to do with them. This shows that employers seriously need to conduct workshops for the employees on how to properly use surgical masks and other protective clothing. Lewin and Smith (2012:67) state that employees required to wear surgical masks must receive training. Retraining must take place annually or when changes in the workplace make it necessary, employees demonstrate deficient understanding of required knowledge. Employees who wear surgical masks even if exposures are below the acceptable exposure limit must be provided with basic information on safe selection and use.

Poor understanding regarding the use of protective clothing among health care workers was a main reason for non-compliance as identified by the study of Leedey, Rinehart and Pear (2012:52) conducted in Durban, South Africa. Weiner (2011:83) indicates that employers are required to train each employee who must use protective clothing, and that employers should make sure that each employee demonstrates an understanding of the protective clothing training, as well as the ability to properly wear and use PC before they are allowed to perform work requiring the use of the PC. If an employer believes that a previously trained employee is not demonstrating the proper understanding and skill level in the use of PC, that employee should receive retraining.

A study by Mokoka, Oosthuizen and Ehlers (2012:261), reports from their quantitative study conducted in Malawi that some health participants mentioned that there are no benefits from attending workshops or awareness due to language problems, therefore,

training should involve peer educators and draw from a range of healthcare occupations and professions as well as involving workers proficient in various languages. Training and workshops should also target the educational level of the intended audience. The employer must document the training of each employee required to wear or use PC by preparing a certification containing the name of each employee trained, the date of training and a clear identification of the subject of the certification. This will help as an evident to the employer when the employee starts complaining of occupational health diseases or any hazard which might occur when an employee is not using protective clothing while performing duties.

According to Lewin and Smith (2012:109), health care workers while on training, should be given a chance to put theory into practice in a controlled environment by demonstrating how to put on and to take off protective clothing, for them to have much more understanding.

A study conducted by De Joy (2011:112), found that healthcare workers who had repeated occupational exposures to blood and body fluids, but who did not acquire infection, had poorer PC compliance, and may have perceived a decreased risk of acquiring infection compared to those who had not been exposed. This experience may lead to a false sense of invulnerability, resultant noncompliance with standards, and increased risk taking, which will prepare the worker for the next unknown infectious disease, therefore: training and continuing education efforts focused on understanding risks and engraining the rationale and policies of the institution's safety culture are needed. Further, they reported that on-going work to delineate the critical elements of risk communication relevant to the use of PC should be conducted. Training should focus on helping workers to reduce barriers in working with patients and performing their job duties while wearing PC and complying with infection control standards.

Duchscher and Cowin (2013:78) reported that cases in their study conducted in Uganda were more likely to report that participants were not receiving enough training about the use of personal protective clothing as they were just being taught theoretically and not practically; therefore they ended up without having enough knowledge. In the

systematic review conducted by Kaerstener (2011:29), results showed that long period employees are the ones not complying on the use of personal protective clothing, claiming of having more experience in the field. In contrast with Lorbergs (2012:187), compliance does not seem to correlate with the working period or experience of an employee, but protective clothing should be used for the reduction of risk and barriers against infection. In this case, Healthcare facilities need to foster and promote a strong culture of safety that includes a commitment to worker safety and extensive training efforts that utilize protocols requiring specific safety actions and detailing consequences for noncompliance.

In China, a study conducted by Cater (2011:101), to assess the compliance of protective clothing among health care workers indicated poor compliance and insufficient knowledge was the main obstacles. Either way, noncompliance to PC increases resulted in health care workers suffering from occupational health diseases which also increase the number of absenteeism on duty. Therefore, supervisors should reinforce the importance of PC and provide training so that noncompliance is the rare exception and not the rule. The legal responsibility for employee on PC usage and adherence falls to the employer.

Occupational Safety and Health Administration (OSHA, 2012), requires the use of protective clothing to reduce employee exposure to hazards. Given the importance of PC in ensuring worker safety, the survey examined the reasons for such high levels of noncompliance. Employers are required to train each employee who must use PC. Employees must be trained to know at least the following:

- When PC is necessary.
- What PC is necessary for.
- How to properly put on, take off, adjust and wear the PC.
- The limitations of the PC.

2.2.3 Reaction of healthcare workers to pc

According to the findings, 35% of health care workers were found experiencing problems of reaction, especially from hand gloves. Infection was one of the most important problems in health care services worldwide. It constitutes one of the most important causes of sicknesses and absenteeism among health care workers. Health care workers are at a high risk of occupational health diseases as they perform their clinical activities in hospitals. They are exposed to blood-borne infections by pathogens, such as human immunodeficiency virus (HIV), hepatitis B and hepatitis C viruses, from contacts with blood and other body fluids. Interventional measures have been proposed to minimize exposure of healthcare workers and patients to infection with the implementation of protective clothing as one of the strategies (Taylor, 2012:114).

According to Koradeck and Furnham (2013:188), protective clothing required by the health care workers include an N95 mask, a surgical mask, a paper mask, protective goggles, gowns, gloves, and hair cover. During the use of these protective clothing, many health care workers experience different problems of different kinds. One of the problems connected with the use of protective clothing (PC) at the workplace was allergy. This was usually because this clothing caused various kinds of problems, with regard to eyes and face protectors and respiratory system protection - a reduction of the visual field and perception of visual signals while using spectacles, goggles, and full-face masks. Acceptance of all protectors by their users mainly depends on the material of the clothing which should be carefully chosen: elasticity of fabrics, their flexibility, and comfort experienced by the users. That is why when designing PC, it is so important to consider not only when designing PC properties determining optimal protection level against selected factors, but also ergonomic aspects ensuring comfort when this equipment is used (Stommel & Will, 2011:401).

The results in a study by Bugajska, Szmauz-Dybko and Soltynski (2012:59), undertaken in Columbia reported that majority of health care workers were suffering from an itching rash, which developed during the use of protective clothing while on duty. The study indicated the type of clothing like gowns being the cause of the problem; it was revealed that the amount of sweat absorbed in the layers of clothing was higher than plastic aprons. This was caused by a sudden increase of the inner temperature of the human

body and of skin temperature. In a hot environment, an increase of inner body temperature is still observed after the end of the effort. This may prove that thermal stress causes heat accumulation in the body, even when the strain factor was not active any more (Lamsal, 2012:105).

Strachota, Lorbergs and Pullan (2013:700) conducted a study regarding factors contributing to the use of PC among health care workers in Turkey and the findings revealed that biophysical properties of available materials used for manufacturing clothing for health service workers were the main cause of reaction or allergy among health care workers. Research conducted in this study on materials used for medical protective clothing showed that woven fabrics and unwoven fabrics without any additional polymeric coating layer cannot ensure full protection against blood and micro-organism penetration. On the other hand, in most cases coating layers have detrimental effect on multilayer materials which resulted into high rate of health care workers suffering from skin problem. However, composite materials have a much worse laying coefficient and much bigger bending rigidity.

Results from an evaluation done by the Medical Research Council (MRC, 2013:99), in South Africa, described opinions from health care workers about the Department of Health on provision of protective clothing as unsatisfactory in terms of quality. Furthermore, cases were In the occupational health disease case study done by Wilson and Booth (2011:201) in Cape Town, it was reported that 48% of health care workers were found suffering from impaired hearing problem due to poor protection of ear protectors; for example, employees who perform welding activities due to noise. More likely to report reaction of health care workers after the use of paper masks which was found that the problem was due to the manufacturer. In this case, many health care workers were suffering from sneezing, rhinorrhoea (runny nose) and coughing immediately after the use of these types of masks. The department was buying the cheaper equipment without following the quality of the product.

The hospital was not just only a place where sick people recover from their illness, but also where the healthy get infected. Workplace exposure and hazards could cause

devastating effects on health and quality of life. Health care workers are at risk of exposure to diseases like Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Human Immunodeficiency Virus (HIV) and other blood borne diseases as they are in direct contact with patients. Health care staffs are at risk of acquiring infections from patients at the workplace. The knowledge and awareness of protective clothing is thus essential for all health care workers and other people in at risk occupations. Protective barriers reduce the risk of exposure of the health care workers. skin or mucous membranes to potentially infectious materials and the risk of exposure to blood and other body fluids to which protective clothing apply by preventing contact with potentially pathogenic microorganisms, this is done by creating a physical barrier between the potentially infectious materials and the health care workers. Allergic skin and respiratory reactions are quite common in personnel working with protective clothing as they are made from different manufacturers and with different materials. Hypersensitivity reactions to PC are serious occupational health problems that develop in many individuals after repeated exposure. Hypersensitivity reactions include nasal congestion, rhinorrhoea (runny nose), sneezing, Itching of the eyes, asthma and a variety of skin manifestations such as redness localized Itching and flaking skin and hives (Scherer & Winter, 2012:543).

Nigerian study conducted in Lagos state by Kalu Odusanya (2011:86) also reported of the reaction of health care workers to PC. The study reported that 48% of health care workers reported skin reaction called dermatitis and during the research study it was found that clothing was found to be the cause of occupational dermatitis. Clothing can be a cause of occupational dermatitis. The source of dermatitis can be the fabric itself for chemical additives used in processing the fabric. The physical or occlusive effect of clothing can result in dermatitis. Contaminated clothing from workplace chemicals, friction from clothing rubbing the skin, or heat retention from perspiration-soaked clothing in hot working environments can cause distinctive dermatologic conditions.

Since medical history and examination cannot reliably identify all patients harbouring blood borne pathogens, protective clothing during exposure to blood and body fluids were mandatory. Gloves should be worn for direct contact with blood or body fluids and for direct contact with non-intact skin or mucous membrane. They can be disposal or

non-disposable, depending on what procedure is to be carried out. The specific types of gloves which should be worn for direct contact with blood or body fluids should fit well and be made with latex because latex gloves are comfortable to wear and feature outstanding textile strength, elasticity and temperature resistance. Latex gloves may cause allergic reactions in some individuals and may not be appropriate for all employees. Another common example was dermatitis on the hands caused by use of protective latex gloves (Donnelly & Selgren, 2011:55).

(Welman, Kruger & Mitchell 2005:200) reported that studies done in Zambia showed that health care workers were facing hardships during the use of gloves as there were individuals reacting on the use of gloves while performing their duties in the hospital. The reaction can be an irritant contact dermatitis from occlusion of the skin by the gloves and constant exposure to the irritant effects of hand washing or the less common allergic reaction to the chemicals used in processing latex (rubber additives, anti-oxidants, preservatives, etc.) or the latex protein.

A study conducted in South Africa by Thomson and Ekvall (2011:188) maintain that with all items of protective equipment, the need for gloves and the selection of appropriate materials must be subject to careful assessment of the task to be carried out and its related risks to patients and healthcare workers. The integrity of gloves cannot be taken for granted and hands may become contaminated during the removal of gloves. In addition, provided evidence showed that vancomycin resistant enterococcus remained on the hands of healthcare workers after the removal of gloves, which may also be the possible cause of reaction to health care workers.

Therefore, the use of gloves as a method of barrier protection reduces the risk of contamination but does not eliminate it and hands are not necessarily clean because gloves have been worn. Gloves should not be worn unnecessarily because prolonged and indiscriminate use may cause adverse reactions and skin sensitivity.

2.3 SUMMARY

Protective clothing was found to be the most precious gift that a health care worker can use at the workplace, as the purpose of PC in South Africa is to prevent infection and reduce suffering of occupational health disease that can be prevented. Health care workers should use protective clothing to reduce occupational health disease and absenteeism at their workplace.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter presented introduction of literature review and challenges faced by health care workers on use of protective clothing of the study. This chapter discusses the research methodology. The study was conducted among health care workers in selected hospitals of Vhembe District in Limpopo province of South Africa in order to determine and assess the use of protective clothing. The study followed quantitative approach using cross-sectional design. Sample was selected, data collected and analysed. The following methodological steps were followed: research approach, research design and research settings.

3.2 Research approach

The approach for this study was quantitative; the researcher chose quantitative study in order to get more information than in qualitative. Quantitative approach is a blue print, pattern or recipe for the study and determines the methods used by the researcher to obtain subjects, collect data, analyse the data and interpret the results (Brink & van Rensburg, 2012:99).

3.3 Research design

Research design defined as a plan that shows how the study is going to look like, a plan according to which data will be assembled. Its purpose is to provide the scheme for achieving the objectives of the study either in form of research, question, hypothesis or study objectives (Brink & van Rensburg, 2012:99).

This study required a rich and deep understanding about the use of protective clothing among health care workers in selected hospitals of Vhembe District in Limpopo

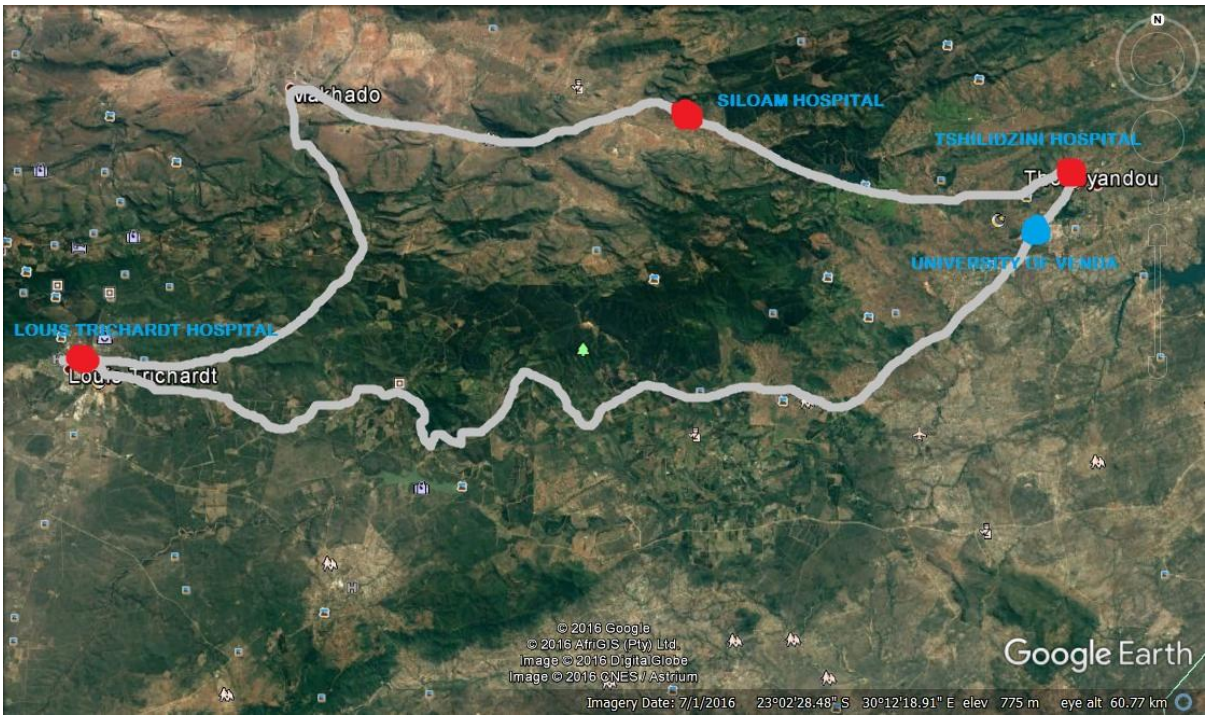
province. In this study, cross-sectional design was used where more information required in a particular field through the provision of one phenomena where data was collected only once with the same subjects. The design was suitable to this study because data were collected at one specific point in time.

3.4 Research Settings

The research setting is the environment in which the research study takes place and can be a natural or controlled environment (Creswell, 2013:181). Natural settings are real life study environment without any changes made for the purpose of the study.

The study was conducted at three selected hospitals. Two of those hospitals are in Vhembe District of Limpopo Province under Makhado municipality whereas the other one is under Thulamela Municipality (figure 1). All these hospitals were chosen as they were facing challenges of high sickness and absenteeism of health care workers in District.

Figure 1: Map of Vhembe District, Limpopo province.



3.5 POPULATION

Vhembe District has a total of eight hospitals, of which for the purpose of this study only three were selected. The target population for this study included students, laboratory staff, radiographers, dentists, nurses, occupational therapists, general assistants, laundry attendants staff, medical practitioners and occupational health and safety ;the total number was 2430 from three selected hospitals of Vhembe District in Limpopo Province. All the healthcare workers who worked in the three hospitals formed part of the population from which the sample was drawn. Health Information System (DHIS) (2014) was used to draw a population frame. There were about 2430 health care workers in the three selected hospitals of which 530 in Louis Trichardt Memorial Hospital (21.8%), 1010 in Tshilidzini Hospital (41.5%) and 890 in Siloam Hospital (36.6%) as shown in a table below:

Table 3.1: Population frame

Hospitals	**Total number of health care workers**
Louis Trichardt Memorial Hospital	530 (530/2430) x 100= 21.8%
Tshilidzini Hospital	1010 (1010/2430) x 100= 41.5%
Siloam Hospital	890 (890/2430) x 100= 36.6%
Total Population	2430 (100%)

(Department of Health, Vhembe District, 2013/2014)

3.6 SAMPLE AND SAMPLING

3.6.1 Sampling of the institutions

For the purpose of this study; three hospitals were purposefully selected for this study because of their high statistics of employees and high sickness and absenteeism in the district and high statistics of occupational health care challenges.

3.6.2 Sampling of participants

The total numbers of the sampled health care workers in three selected hospitals were 205; 45 in Hospital A, 80 in Hospital B and also 80 in Hospital B. Slovin's (1960) formula was used to calculate the sample size (n) given the population size (N) and a margin of error (e); it's a random sampling technique formula to estimate sampling size. It is computed as n = N. Convenient sampling was used. Only participant who were found in the selected hospitals were included in the study until desired sample size reached (Burns & Grove, 2009:343).

3.6.3 Sample size

To determine the sample size, Slovin's (1960) formula {n=N/ (1+Ne2)} was used as shown below, where N is the total number of population from three hospitals, n is the sample size and e is the level of error:

n = N/ (1+N (e) 2)

n = 2430 / (1+2430 x (0, 0 5)2)

= 2430 / (1 + 12.14)

= 2430 / 13.15

n =205 .7

Sample size (n) = 205

Table 3.2: Sampling frame

Hospitals	Total number of sample in each hospital	Percentage
LouisTrichardt memorial	205(/243) x 530= 40	21.7%
Tshilidzini	(205/2430) x 1010= 76	41,3%
Siloam	(205/2430) x 890= 67	36,4%
Total	205	100%

Table 3. 3: Sample of health care workers in selected hospitals

Hospital Names	Health workers	Frequency	Percentage
Louis Trichardt Hospital	Nurses	13	32,5%
	Students	05	12,5%
	Laboratory staff	01	2,5%
	Dentists	02	5%
	Medical practitioners	03	7,5%
	Radiographers	03	7,5%
	Laundry attendance	04	10%
	General assistants	05	12,5%
	Occupational therapists	02	5%
	Occupational Health and Safety	02	5%
Tshilidzini Hospital	Nurses	45	57,6%
	Students	07	8,97%
	Laboratory staff	02	2,5%
	Dentists	01	1,28%
	Medical practitioners	05	6,4%
	Radiographers	02	2,5%
	Laundry assistants	06	7,69%
	General assistants	00	0%
	Occupational therapists	04	5%
	Occupational Health and Safety	04	5%
Siloam Hospital	Nurses	22	32,8%
	Students	10	14,9%
	Laboratory staff	05	7,4%
	Dentists	03	4,47%

	Medical practitioners	05	7,4%
	Radiographers	02	2,5%
	Laundry assistants	05	7,4%
	General assistants	08	11,9%
	Occupational therapists	05	7,4%
	Occupational Health and Safety	02	2,98%
Total		205	100%

Vhembe district 2016 health care workers sample statistics.

3.6.4 Inclusion criteria

Health care workers who were 21 years and older, mentally competent (not with mental challenges) and were willing to participate in the study.

3.6.5 Exclusion criteria

Anyone below 21years was excluded from the study.

3.7 Pre-testing instrument

Pre-testing is the administration of the data collection instrument with a small set of respondents from the population for the full scale survey. Before the final data collection was conducted, pre-test was conducted in the institution that was not included in the main study. Pre-test study was done in order to test data collection instrument, it was done in a different hospital. Nothing was modified from pre-testing.

3.8 Measurement Instrument

A self-designed self-administered questionnaire was used for this study. Open and closed ended questions were used. This study involved the use of structured questionnaires. The questionnaire was designed in English, translated into 3 languages

namely TshiVenda, XiTsonga and SePedi by language expects and was divided into four sections soliciting the following information:

1) Biographic data such as gender, age, marital status and race group
2) Assessment of use of protective clothing
3) Challenges of use of protective clothing
4) Important of protective clothing

3.9 Data collection

The data collection dates and times were arranged with institutions management. Special room was reserved for this purpose by the hospitals so as to avoid distracting the routine activities of the hospitals. Questionnaires used for data collection (Appendix 1 and 2) and these were distributed to the health care workers. The researcher and her trained assistant assisted the participants. The researcher arranged the time with the participants and obtained their consent to be offered questionnaires. Data were collected at the venues arranged by the person in charge of the ward, in a quiet room free from noise to ensure good atmosphere. The researcher collected data after arranging with the hospitals management. The study comprised of 205 participants, therefore from the three hospitals, 80 participants in two hospitals and 45 in another hospital were interviewed per week. Self-administered questionnaires (see annexure A) were used for collecting data adopted from Stommel and will (2011:345) and modified to suit the context. The method was chosen because participants respond to the same questions, in the same order as data collected in the same manner to all participants (Devos, Strydom, Founce & Delport 2011:118).

3.10 Data Analysis

According to Brink and van Rensburg (2012:321) data analysis entails categorizing, ordering, manipulating and summarizing the data and describing in meaningful terms. A descriptive approach employs measures such as frequency distributions and measures of central tendency. Descriptive statistics (means, standard deviations and frequencies)

were used to describe and summarize data. Chi square (X2) test was used for relationships between categorical variables. Data were first checked using frequency tables, to see whether there are any missing/incorrect values. The research team converted and condensed a collection of data into an organized, visual representation, or picture in variety ways, so that the data have some meaning for the readers of the research report. The use of graphic was done to analyse data to be of value.

The researcher worked closely with a statistician, data was tabulated using Microsoft excel and analysed using Statistical Package Social Sciences (SPSS version23) which was a popular statistical analysis software package; it is one of the most popular team (Department of health, 2010:77).

The researcher was present during this period to help in deciding whether a graph, bar charts, tables or histogram suitable for each and every section to be analysed (Burns & Grove, 2009:116). Analysis of data collected in large investigation, mechanical and electronic facilities was used as far as possible and in order to use computer in the analysis of data, questionnaires were compiled in a certain manner. To successfully describe objective number two, the researcher used Chi-square test to investigate the association of the demographic data against variables in question. Chi-square test is usually used to test for independents or association between variables. Graphs and frequency were obtained

3.11 Validity and Reliability

3.11.1 Validity

Validity refers to the extent to which an empirical measure accurately reflects the concept it is intended to measure. Woods (2013:267) state that validity of a measurement process measures the variables it claims to measure. The instrument actually measures the concept in question and that the concept is measured accurately. Example, if participants are asked the following questions, “Do health workers view protective clothing as important in their workplace?” This question is applicable to the study that is being conducted. It has to do with whether measuring device covers the full

range of meaning or forms that would be included in a variable being measured. In this study, face validity and content validity were ensured.

- **Face validity**

To ensure validity of the measuring instruments, face validity which means that the instrument appears to measure what is supposed to measure was applied where the measuring instruments submitted to experts who judged the instrument and their judgement is based on their tuition in the field. During pilot study, validity of instrument was checked by administering same questions to participants who were included on the study having the same characteristics as the population under study (Brink & van Rensburg, 2012:132). In this study, to ensure face validity, the instrument was shaped by an extensive review of literature from similar studies conducted locally and internationally.

- **Content validity**

Content validity is defined as an assessment of how well the instrument represents all the different components of the variables to be measured. It is used mainly in the development of questionnaires. The researcher constructed the instrument based on literature review. To ensure content validity, after designing the questionnaire it was taken to the statistician for validity assessment. In this study, to ensure content validity, the instrument was also shaped by an extensive review of literature from similar studies conducted locally and internationally and scrutinized by both supervisors to provide assurance of validity.

3.11.2 Reliability

Reliability is defined as the extent to which the instrument yields the same results on repeated measures. Reliability of a measurement procedure is stability or consistency of the measuring instruments. This means that if the same variable is measured under the same condition it will yield the same results (Woods, 2013:97). According to Woods (2013:421) equivalence reliability is defined as test of equivalence that attempt to determine whether similar test is given at the same time yield the same results or whether the same results can be obtained by using different observers at the same time.

In this study, the reliability of the instrument was determined by the test-retest method, this type of reliability of an instrument is determined by administering the instrument to the same subjects on two or more occasions. The first set response was then compared with the second set. Test-retest reliability is done to find out if they are going to give the same results. To ensure consistency and precision of results, a structured questionnaire was used to collect data from participants. Consistency in answering of the questions was assessed using test-retest technique.

3.12 Ethical Considerations

The study was presented to the School Higher Degree Committee (SHDC) of the School of Health Sciences at the University of Venda, then to the (UHDC) University Higher Degree and recommended for ethical approval by the University Ethics Committee. Further permission was requested from Limpopo Provincial Department of Health and district managers as well as hospitals CEO s (**Appendix 8**).

- **Informed consent**

Informed consent means that the subjects have full knowledge of understanding about research projects in which they are being asked to participate. It includes providing subjects with a full description of the purpose of the project and its general value. All procedures used in a research and why, the amount of time and energy that the research will take, the manner in which data will be used (Polit & Beck, 2011:501). In this study, consent forms were given to participants to be completed (**Appendix 3**). Each of the participants was informed that their participation in the study was voluntary. The participants were free to withdraw from participation at any time should they wish to do so and that should not affect the service which they should receive.

- **Privacy**

Brink and van Rensburg (2012:111) defines privacy as the freedom an individual has to determine the extent and general circumstances under which private information will be shared with or withheld from others. Invasion of privacy occurs when private information is shared without the individual‘s knowledge and against his will or wish therefore data should not be collected without the subject‘s knowledge and consent. Individual who participate in research has the right to expect that the information collected from or about them will remain private and this can occur through either anonymity or

confidentiality. In this study, the researcher protected the rights of the participants for anonymity, confidentiality, informed consent, benefit and self-determination.

- **Confidentiality and Anonymity**

Confidentiality refers to the researcher not sharing private information shared by a respondent unless it is with the consent of the respondent (Burns & Grove, 2009:306). Brink and van Rensburg (2012:201) maintains that confidentiality entails that no information provided by the participant should be divulged or made available to any person. When a participant agrees to participate in research project; this right falls away since the information provided must be included in a research report. In this study, information gathered was treated as strictly confidential and only the researcher was aware of the origin of the data.

Anonymity means that participant`s names are kept separate from the data so that no one not even the researcher knows the identity of the data supplier (Brink & van Rensburg,2012:217) Project leader and all professional people participating in one research are responsible for this aspect of the research. If the anonymity of people is threatened, all research records should be destroyed. In this study, the participant`s identities were protected by not attributing participant`s names to be written on the questionnaires and also not to include anything that one can recall them with. A code was assigned to every participant so in that way they remain anonymous.

- **Harm**

In this study, the researcher planned to avoid any possible physical or psychological harm to subject. Participants were respected, not looked down upon. The researcher also ensured that she is at their level and also understood their culture not to say something that according to them is an insult, to ask questions that does not offend them (Brink & van Rensburg, 2012:324)

3.13 Summary

This chapter described introduction, research approach, research design, research settings, population, sample and sampling, pre-testing, data collection, data analysis, validity and reliability, ethical considerations and conclusion.

CHAPTER 4

RESULTS OF THE STUDY

4.1 Introduction

Chapter three discussed research methodology, measures to ensure trustworthiness and ethical consideration of the study. This chapter presents and describes the research findings based on the analysis of data obtained from three selected hospitals in the Vhembe district. The results include participant s biographic data, assessment of non-use of protective clothing, challenges of non-use of protective clothing.

4.2 Research results

Health care workers from three selected hospitals were targeted for this study. Of the 205 questionnaires distributed, 200 were completed and returned, giving a response rate of 95%.

4.3 Demographic data of participants

Demographic data collected included gender, age, marital status, race group, occupation, experience, sections and health status.

These results show that the sample is composed of gender, age, marital status, race group, occupation, experience, sections and health status.

Gender: The results show that the majority of the participants were females 150 (73, 5%) and males were 54 (26, 5%).
Age: The majority of the respondents were between the age of 25 and 40 years of age 114 (55, 9%), followed by respondents above 40 years of age 78 (38, 2%).

Marital status: The results show that 120 (58, 8%) were married whereas 84 (41, 2%) were single.

Race group: According to the participants 186 (93, 9%) were Africans, followed by 6 (3, 0%) who were Coloureds and Indians. The results also show 6 (3, 0%) which were missing.

Table 4.3.1: Frequency and percentage table of demographic data (gender, age, marital status, race, Occupation, experience and sections and health status)

		Frequency	Percentage %
Gender	Female	150	73.5%
	Male	54	26.5%
Age	Below 25	12	5.9%
	Between 25 and 40	114	55.9%
	Over 40	78	38.2%
Marital status	Married	120	58.8%
	Single	84	41.2%
Race group	African	186	93.9%
	Coloured	6	3.1%
	Indian	6	3.0%
	Other	0	0.0%
	Missing	6	3.0%
Occupation	Health Professionals	168	82.4%
	Allied workers	6	2.9%
	Housekeeping staff	30	14.7%
Experience	0-5 years	72	35.3%
	5-10 years	90	44.1%
	Above 30 years	42	20.6%
Sections	Nursing	120	58.8%
	Clinical Services	30	14.7%
	Allied services	6	2.9%
	Dental	24	11.8%
	Housekeeping	24	11.8%
Health status	Excellent	72	35.3%
	Very good	72	35.3%
	Good	48	23.5%
	Fair	6	2.9%

	Poor	6	2.9%

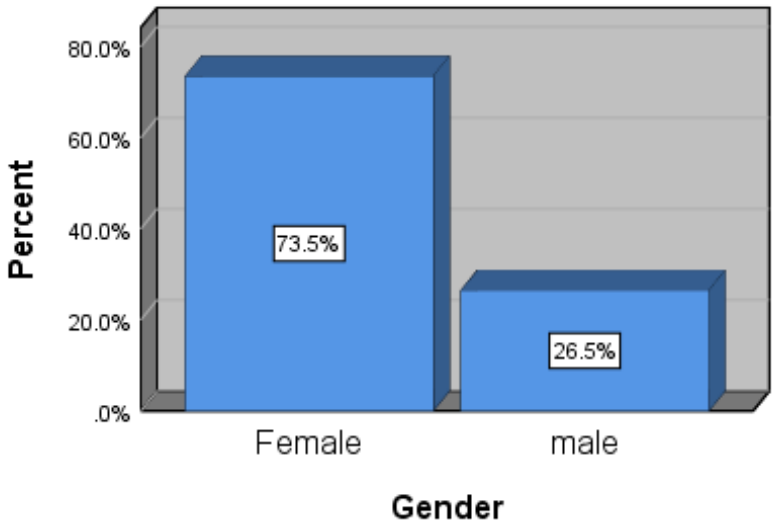
Occupation: The majority of the respondents were health professionals 168 (82, 4%), followed by housekeeping staff 30 (14, 7%), followed by 6 (2, 9%).

Experience: The results show that 90 (44, 1%) were 5 to 10 years experienced, followed by 72 (35, 3%) who were 0 to 5 years experienced, followed by 42 (20, 6%) who were above 30 years.

Sections: Most of the correspondents were from nursing sections 120 (58, 8%), clinical services 30 (14, 7%), dental 24 (11, 8%), Allied 6 (2, 9%).

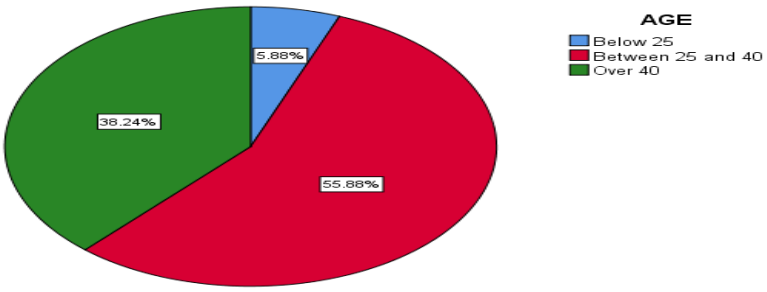
Health status: The results show that 72 (35, 3%) were excellent and very good in health status, 48 (23, 5%) were in good health status and 6 (2, 9%) were in fair and poor health status.

Graph 4.3.1: Gender distribution



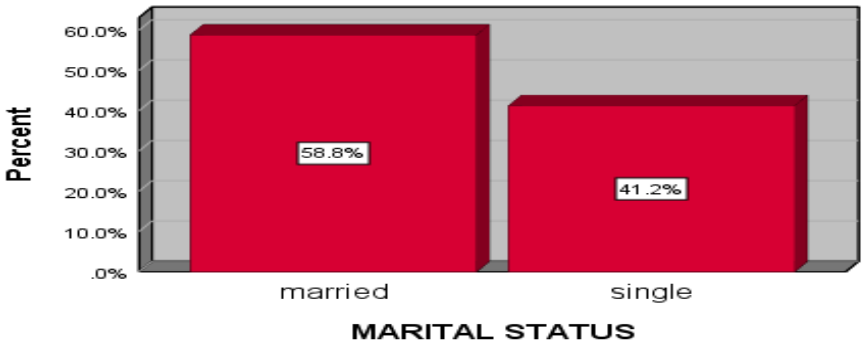
The results of the gender distribution according to the participants indicates that 73, 5% were females and 26, 5% were males.

Graph 4.3.2: Age distribution



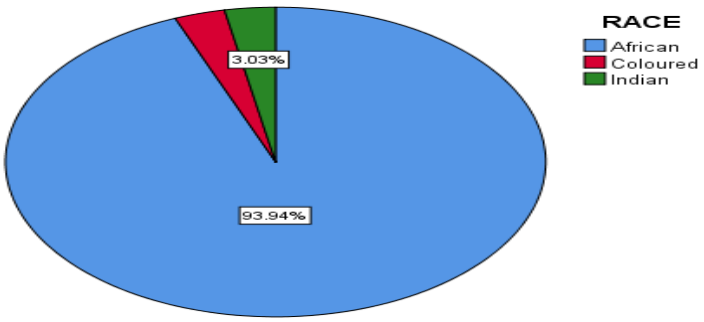
Graph 4.3.2 shows that in this research study the distribution of age were as follows (: 55, 88%) were below 25 years, (38, 24%) were between the age of 25 and 40 years whereas (5, 88%) were above 40 years.

Graph 4.3.3: Marital status distribution



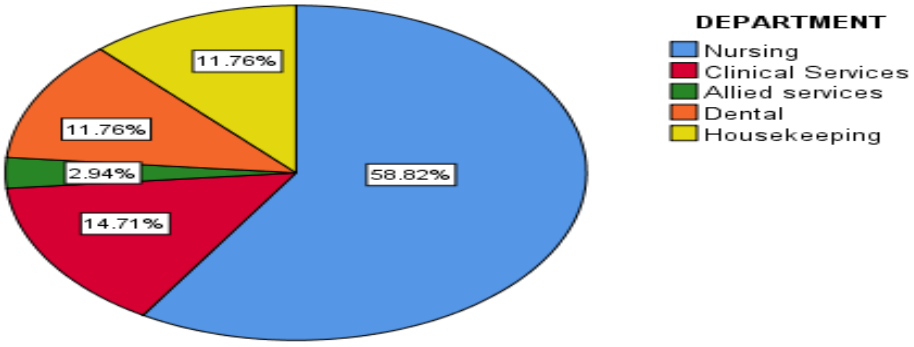
The results in graph 4.3.3 show that 58, 8% of participants were married and 41, 2% were single.

Graph 4.3.4: Race Group distribution



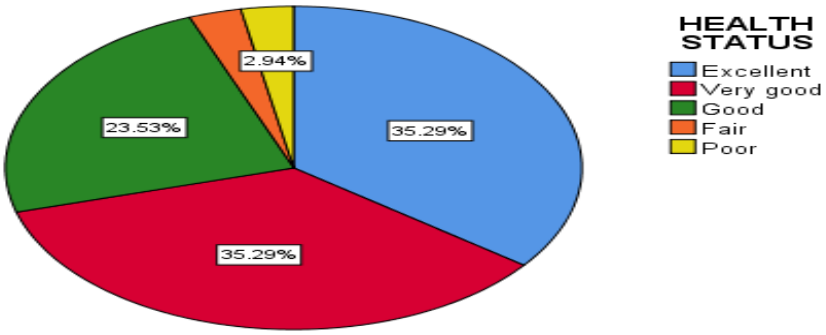
Graph 4.3.4 shows that in this research study the distribution of the race group were as follows: 93, 94% were Africans, 3, 03% were Coloureds and also Indians were 3, 03%.

Graph 4.3.5: Sections in which participants are working.



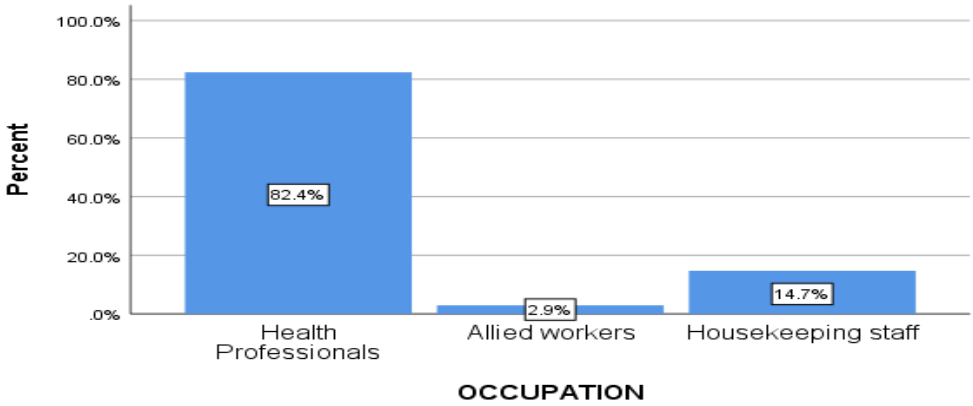
This graph shows the sections distribution of the participants. Sections distributions according to the participants indicate that about 58, 82% of health care workers are in Nursing. Followed by 14, 71% of the respondents who are in clinical services.11, 76% of health care workers are in dental whereas 2, 94% are in allied services section.

Graph 4.3.6: Health status distribution



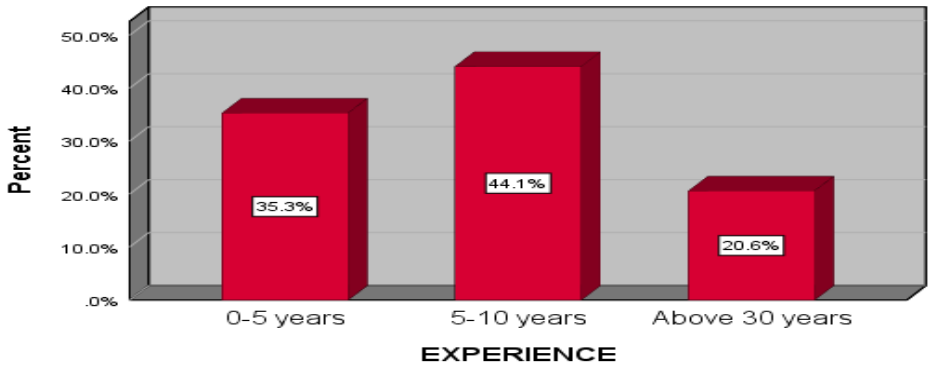
The health status according to the participants indicates that about 35, 29% of the respondents have excellent health status and very good health status. Followed by the 23, 53% of the respondents stated that their health status is good, followed by 2, 94% who have fair and poor health status.

Graph 4.3.7: Occupation distribution



The results in this study show distribution of occupation as follows: 82, 4% were health professionals, 2, 9% were allied workers and 14, 7% were housekeeping staff.

Graph 4.3.8: Experience distribution



Experience distribution according to the participants indicated that, 35, 3% were from 0-5 years, 44, 1% were from 5-10 years and 20, 6% were above 30 years. This simply means that majority of participants who were more experienced in this study were from 5 to 10 years.

4.4 Negative health symptoms during use of protective clothing

Table 4.4.1: Frequency and percentage table for negative health symptoms during use of Protective clothing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Respiratory	30	14	14.7	14.7
	Skin problems	30	14	14.7	29.4
	Body reactions	42	19.5	20.6	50
	None	102	47.4	50	100
	Total	204	94.9	100	
Missing	System	11	5.1		
Total		215	100		

The results in Table 4.4.1 show that majority of respondents answered this question. Of those who answered the question, 30 (14, 0%) indicated that they suffered respiratory problem, 30 (14, 0%) indicated that they had skin problems, 42 (19, 5%) indicated that had body reactions whereas 102 (47, 4%) indicated that they did not experience any problem.

Table 4.4.2: Distribution of "negative health symptoms during use of PC" across demographic data (that is, gender, age, occupation and experience)

Negative health symptoms during the use of PC.		Female	Male	Age			Occupation			Experience		
				Below 25yrs	25 - 40yrs	Over 40yrs	Health prof.	Allied Worker	House keeper	0-5 years	5-10 years	Above 10 years.
	Respiratory problem	16%	11,1 %	0%	15,8%	15,4%	10,7%	0%	40%	8,3%	26,7 %	0%
	Skin problem	20%	0%	0%	15,8%	15,4%	17,9%	0%	0%	16,7 %	20%	0%
	Body reactions	20%	22,2 %	0%	21,1%	23,1%	25,%	0%	0%	25%	6,7%	42,9%
	None	44%	66,7 %	100%	47,4%	46,2%	46,4%	100%	60%	50%	46,7 %	57,1%

The results of table 4.4.2 show that the sample is composed of the following aspects:

Gender: According to the participants, 16, 0% who suffered respiratory problem were females whereas 11, 0% were males. With skin problems, 20, 0% were females

whereas 0, 0% were males. Participants who suffered body reactions indicated that 20, 0% were females and 22, 2% were males. 44, 0% of females and 66, 7% of males indicated that they did not experience any reaction.

Age: The results show that majority of the participants 15,8% between 25 and 40 years suffered respiratory problem, followed by 15,4% above 40 years whereas below 25 years were 0,0%.The majority of participants 23,1% over 40 years suffered body reactions followed by 21,1% between 21 and 40 years of age. With skin problem, 15, 8% between 25 and 40 years had reaction. 100% below 25 years, 47, 4% between 25 and 40 years and 46, 2% above 40 years indicated no reactions experienced.

Occupation: According to the participants 40, 0% of Allied workers experienced respiratory problem, followed by 10, 7% of Health professionals and also 0, 0% of Allied workers. The skin problem only experienced by Health professionals with 17, 9%. Results also
Show that only Health professionals 25, 0% suffered body reaction.

Experience: The results show that majority of respondents from 5 to 10 years' experience 26, 7% suffered respiratory problem, followed by 8, 3% from 0 to 5 years.0 to 5 years experienced participants indicated that they suffered skin problem which was 16, 7%, followed by 20% from 5 to 10 years' experience participants.

4.5 Allergic reactions to protective clothing

Table 4.5.1: Frequency and percentage table of allergic reactions according to gender, age, occupation and experience

The use of latex gloves	Male	Female	Below 25yrs	Between 25 & 40 yrs.	Above 40yrs	Health Prof	Allied Worker	House keeper	0-5 yrs	5-10 Yrs	Above 10 yrs
Rash	95,8%	88,9%	100%	94,7%	91,7%	92,2%	100%	100%	100%	92,9%	85,7%
Swelling	4,2%	11,1%	0,3%	5,3%	8,3%	7,4%	0%	0%	0%	7,1%	14,3%
Disposable gown	71,4%	88,9%	50%	100%	50%	70,8%	100%	100%	81,8%	83,3%	57,1%
Plastic aprons	28,6%	11,1%	50%	0%	50,0%	29,2%	0%	0%	18,2%	16,7%	42,9%
Surgical gloves	25%	33,3%	0%	33,3%	23,1%	25,9%	0%	40%	16,7%	35,7%	28,6%
Surgical masks	75%	66,7%	100%	66,7%	76,9%	74,1%	100%	60%	60%	64,3%	71,4%
Hypersensitivity (bronchopneumonia)	8,3%	22,2%	0%	11,1%	15,4%	11,1%	100%	0%	16,7%	17,1%	14,3%

Hypersinsitivity (nasal congestion)		91,7%	77,8%	100%	88,9%	84,6%	88,9%	0%	100%	83,3%	92,9%	85,7%
Non-compliance	TB	56,5%	66,7%	50%	64,7%	53,8%	61,5%	100%	40%	81,8%	42,9%	51,7%
	HIV	43,5%	33,3%	50%	35,3%	46,2%	38,5%	0%	60%	18,2%	57,1%	42,9%
Actions after reaction	OHS	78,3%	75%	100%	77,8%	72,7%	84%	0%	60%	90,9%	71,4%	
	Doctor	8,7%	0%	0%	5,6%	9,1%	8%	0%	0%	0%	14,3%	
	Casualty	8,7%	25%	0%	11,1%	18,2%	4%	100%	40%	9,1%	7,1%	
Any OHS in the hospital	Yes	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
	No	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

The table illustrate the number and percentage of respondents on allergic reactions according to gender, age, age, occupation and experience.

The use of latex gloves

Age of respondents: the results shows that ages of respondents varied as follows; those who experienced rash problem were (100%) below 25 years, (94, 7%) between 25 and 40 years and (91, 7%) above 40 yrs. On swelling problem, below 25 years were (0, 3%), between 25 and 40 years (5, 3%) and above 40 years were (8, 3%).

Gender of respondents: results display that on rash problem (95, 8%) were males whereas (88, 9%) were females. On swelling problem, (4, 2%) were males whereas (11, 1%) were females.

Occupation of respondents: table 4.5.1 illustrates that those who experienced rash problem on health professionals were (92, 2%), allied workers were (100%) and housekeepers also (100%). With swelling problem, health professionals (7, 4%), allied workers (0%) and house keeper (0%).

Working experience of respondents: table 4.5.1 indicates that respondents who suffered rash problem with 0-5yrs experience were (100%), 5-10yrs experience (92, 9%) and those above 10yrs experience were (85, 7%). With swelling problem, respondents with 0-5yrs (0%), 5-10yrs (7,1%) and above 10yrs were (14,3%).

Body itching caused by PC

Age of respondents: table 4.5.1 indicates that respondents who suffered body itching due to disposable gowns below 25yrs were 50%, between 25 and 40yrs indicates 100% and above 40yrs indicates 50%. Body itching caused by plastic aprons indicates 50% below 25yrs, 0% between 25 and 40yrs and 50% above 40yrs.

Gender of respondents: disposable gowns results indicate 71, 4% were males and 88, 9% were females. Plastic apron results indicate 28, 6% males and 11, 1% females.

Occupation of respondents: table 4.5.1 summarizes the occupation of respondents. Body itching caused by disposable gowns were (70, 8%) health professionals, (100%) allied workers, (100%) house keepers.

Working experience of respondents: results indicate that body itching caused by disposable gowns between 0- 5yrs were (81, 8%), 5-10yrs were (83, 3%) and above 10yrs were (57, 1%). Body itching caused by plastic aprons between 0-5yrs were (18, 2%), 5-10yrs (16, 7%) above 10yrs (42, 9%).

Respiratory reactions due to PC

Gender of respondents: results show that on respiratory reaction due to surgical gloves males were 25% whereas females were 33, 3%. On respiratory reaction due to surgical mask results show that 75% were males whereas 66, 7% were females.

Age of respondents: table 4.5.1 illustrate that below 25yrs were 0%, between 25 and 40yrs were 33,3% and above 4yrs were 23,1% due to surgical gloves. Respiratory reaction due to surgical mask below 25yrs were 100%, between 25 and 40yrs were 66,7% and above 40yrs were 76,9%.

Occupation of respondents: table 4.5.1 indicated that respiratory reactions due to surgical gloves were as follows; health professionals (25, 9%), allied workers (0%) and house keeper (40%).Respiratory reactions due to surgical mask were also as follows; health professionals (74, 1%), allied workers (100%) and house keepers were (60%).

Experience of respondents: results show that reactions due to surgical gloves were 16,7% from 0 to 5yrs, 35, 7% from 5 to 10yrs and 28, 6% above 10yrs. On reactions due to surgical mask results show that from 0 to 5yrs were 83, 3%, from 5 to 10yrs were 64, 3% and above 10yrs were 71, 4%.

Hypersensitivity

Age of respondents: table 4.5.1 shows that the ages of respondents varied as follows: those who were below 25 years (0%) suffered bronchopneumonia and (100%) suffered nasal congestion. Those between 25 and 40 years (11 1%) suffered bronchopneumonia and (88, 9%) suffered nasal congestion. Above 40 years of age (15, 4%) suffered pneumonia and (84, 6%) suffered nasal congestion.

Gender of respondents: table 4.5.1 displays that (8, 3%) males and (22, 2%) females suffered bronchopneumonia. (91, 7%) males and (77, 8%) females suffered nasal congestion.

Occupation of respondents: table 4.5.1 illustrates that with allied workers; 100% suffered bronchopneumonia and 0% nasal congestion. 11, 1% health professionals suffered bronchopneumonia and 88, 9% suffered nasal congestion.0% housekeepers suffered bronchopneumonia and 100% suffered nasal congestion.

Experience of correspondents: table 4.5.1 summarizes the experience status of respondents, from 0 to 5 years (16, 7%) suffered bronchopneumonia and (83, 3%) suffered nasal congestion. From 5 to 10 years (17, 1%) suffered bronchopneumonia and (92, 9%) suffered nasal congestion. Above 10 years (14, 3%) suffered bronchopneumonia and (85, 7%) suffered nasal congestion.

Non-compliance

Gender of respondents: About (56, 5%) males suffered tuberculosis and (43, 5%) suffered immune deficiency virus due to non-compliance. (66, 7%) females suffered tuberculosis and (33, 3%) suffered immune deficiency virus due to non-compliance.

Age of respondents: table 4.5.1 shows that age of respondents varies as follows: those who were below 25 years (50%) suffered tuberculosis and (50%) suffered immune deficiency virus due to non- compliance. Those between 25 and 40 years
(64, 7%) suffered tuberculosis and (35, 3%) suffered immune deficiency virus. Above 40 years of age (53, 8%) suffered tuberculosis and (46, 2%) suffered immune deficiency virus.

Occupation of respondents: About 61, 5% health professionals suffered tuberculosis whereas 31, 5% suffered immune deficiency virus due to non-compliance. 100% allied workers suffered bronchopneumonia and 0% suffered immune deficiency virus. With housekeepers, 40% suffered tuberculosis and 60% suffered immune deficiency virus.

Experience of participants: report shows that respondents from 0 to 5 years' experience, (81, 8%) suffered tuberculosis and (18, 2%) suffered immune deficiency virus. From 5 to 10 years (42, 9%) suffered tuberculosis and (57, 1%) suffered immune deficiency virus. Above 10 years (51, 7%) suffered tuberculosis whereas (42, 9%) suffered immune deficiency virus.

Actions after reaction

Gender of respondents: table 4.5.1 indicates that 78, 3% males consult at Occupational Health and Safety, 8, 7% at the doctor and also 8, 7% at Casualty after reaction. 75% females consult at Occupational Health and Safety, 0% at the doctor and 25% at Casualty after reaction.

Age of respondents: the results display age of respondents as follows: those who were below 25 years 100% indicated that they consult at Occupational Health Safety, 0% at the doctor and also 0% at Casualty. Between 25 and 40 years 77, 8% at OHS, 5, 6% at the doctor and 11, 1% at Casualty. Above 40 years of age, 72, 7% at OHS, 9, 1% at the doctor and 18, 2% at Casualty.

Occupation of respondents: About 84% of health professionals reported that they consult at OHS, 8% at the doctor and 4% at Casualty. 0% of allied workers indicated OHS, 0% at Casualty and 100% at the doctor. With housekeepers, 60% indicated OHS, 0% indicated at the doctor and 40% indicated casualty.

Experience of respondents: table 4.5.1 illustrates that from 0 to 5 years (90, 9%) consult at OHS, 0% at the doctor and 9, 1% at Casualty. From 5 to 10 years (71, 4%) indicated OHS, (14, 3%) at the doctor and (7, 1%) at Casualty. Above 10 years of age (66, 7%) indicated OHS, (0%) indicated at the doctor and (3, 3%) indicated Casualty.

Availability of OHS in the hospital

Gender of respondents: results indicated that both males and females were 100% “yes” and 0%” No”.

Age of respondents: table 4.5.1 illustrates that both respondents indicated 100% “yes” and 0% “No”.

Occupation of respondents: table 4.5.1 display that all respondents indicated 100% “yes” and 0% “No”.

Experience of participants: according to table 4.5.1, results of all participants indicated 100% “yes” and 0%” No”.

Table 4.5.2: Frequency and percentage table of allergic reactions caused by protective clothing

		Frequency	Percent
The use of Latex gloves causes	Rash	186	93.9%
	Swelling	12	6.1%
Body itching is one of the reason caused by PC	Disposable gowns	138	76.7%
	Plastic aprons	42	23.3%
Respiratory reaction is quite common in personnel working with PC	Surgical gloves	54	27.3%
	Surgical mask	144	72.7%
Hypersensitivity	Bronchopneumonia	24	12.1%
	Nasal congestion	174	87.9%
Non-compliance for the use of PC lead to exposure	Tuberculosis	114	59.4%
	Immunodeficiency virus	78	40.6%
What to do if you develop one of the reactions	Health and Safety	144	77.4%
	Doctor	12	6.5%
	Casualty	24	12.9%
Do you have occupational health and safety in hospital	Yes	204	100%
	No	0	0.0%

Table 4.5.2 illustrate results of respondents as follows:

The use of latex gloves: results indicated that 186(93, 9%) of respondents had a problem of rash due to latex gloves whereas 12(6, 1%) had a problem of swelling.

Body itching: about 138(76, 7%) of respondents indicated that they suffered body itching due to disposable gowns and 42(23, 3%) suffered body itching due to plastic aprons.

Respiratory reaction: results display that 54(27, 3%) suffered respiratory reaction due to surgical gloves while 144(72, 7%) suffered due to surgical masks.

Hypersensitivity: about 24(12, 1%) respondents suffered pneumonia due to hypersensitivity while 174(87, 9%) suffered nasal congestion.

Non-compliance: according to results, respondents indicated that 114(59, 4%) who doesn't comply on the use of PC suffered tuberculosis and also78 (40, 6%) suffered immune deficiency virus due to non-compliance.

What to do if you develop one of the following reactions: on this question, respondents selected their answers from a list of options that were provided.

Table: 4.5.2 illustrates that 144(77, 4%) respondents indicated they consult at OHS after reaction from protective clothing, 12(6, 5%) at the doctor and 24(12, 9%) consult at Casualty.

Do you have occupational health and safety in the hospital: on this question, respondents selected their answers from a list of options that were provided.
Table 4.5.2 display that both respondents indicated that they do have OHS in the hospital.

Table 4.5.3: Allergic to any of the following: pollens, latex and medicines?

Valid	Frequency	Percentage	Valid Percent	Cumulative Percent
YES	78	36,3%	38,2%	38,2
NO	126	58,6%	61,8%	100
TOTAL	204	94,9%	100%	
MISSING SYSTEM	11	5,1%		
TOTAL	215	100%		

Table 4.5.3 illustrates that 78(38, 2%) respondents indicated that they were allergic to pollens, latex and medicines While 126(61, 8%) were not. Results also show that 11(5, 1%) were missing.

Table 4.5.4: Frequency and percentage table for prevention of protective clothing

PC helps prevent cross infection	Yes	198	97,1%
	No	6	2,9%

A nurse who uses PC is at risk	Yes	24	12,1%
	No	174	87,9%
It is not easy to the doctor who doesn't use PC	Yes	198	97,1%
	No	6	2,9%
Sterile hand gloves can be used twice	Yes	0	0%
	No	204	100%
Did you attend any workshop For PC?	Yes	84	41,2%
	No	120	58,8%

Table 4.5.4 summarizes the results as follows:

PC helps prevent cross infection: results show that 198 (97, 1%) respondents indicated that protective clothing helps on prevention of cross infection while 6(2, 9%) didn't agree with that. A nurse who uses PC is at risk: according to the results, 24(12, 1%) respondents supported that a nurse who uses PC is at risk while 174 (87, 9%) did not support that. It's not easy to the doctor who doesn't use PC: the results show that 198(97, 1%) answered" yes" while 6(2, 9) answered "No". Sterile hand gloves can be used twice: about 204(100%) of respondents answered "No" while none of respondents agreed. Did you attend any workshop for PC? Was intended to ascertain whether the respondents have ever attended any workshop about PC. The results show that 84(1, 2%) answered" yes" while 120(8, 8%) answered" No".

Table 4.5.4 below results show the frequency and percentage of the participants' prevention of protective clothing according to gender, age and occupation.

Protective clothing helps prevent cross infection

Gender of respondents: about 96% of males answered" yes" whereas 4% answered "No". In males results indicated 100% yes and 0%" No".

Age of respondents: table 4.5.4 display age of respondents as follows; below 25 years were 100% answered yes and 0%" No". Between 25 and 40 years 100% "yes" and 0%" No". Above 40 years were 92, 3% "yes" and 7, 7%' No".

Table 4.5.5: Frequency and percentage table for prevention of protective clothing according to gender, age, occupation and experience.

	Female	Male	Below 25yrs	Between 25 and 40yrs	Above 40yrs	Health prof.	Allied worker	House keeper	0-5yrs	5-10yrs
Protective clothing helps prevent cross infection	96% Yes	100% Yes	100% Yes	100% Yes	92,3% Yes	96,4% Yes	100% Yes	100% Yes	91,7% Yes	100% Yes
	4% No	0% No	0% No	0% No	7,7% No	3,6% No	0% No	0% No	8,3% No	0% No
A nurse who uses PC while performing duty is at risk	16% Yes	0% Yes	0% Yes	5,3% Yes	25% Yes	7,4% Yes	0% Yes	40% Yes	8,3% Yes	13,3% Yes
	84% No	100% No	100% No	94,7% No	75% No	92,6% No	100% No	60% No	91,7% No	86,7% No
It's not easy for the doctor who doesn't use PC while examining a patient	96% Yes	100% Yes	100% Yes	100% Yes	92,3% Yes	96,4% Yes	100% Yes	100% Yes	100% Yes	93,3% Yes
	4% No	0% No	0% No	0% No	7,7% No	3,6% No	0% No	0% No	0% No	6,7% No
Sterile hand gloves can be used twice from one patient to another	0% Yes	0% Yes	0% Yes	0% Yes	0% Yes	0% Yes	0% Yes	0% Yes	0% Yes	0% Yes
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Did you attend any workshop for PC	32% Yes	66,7% Yes	0% Yes	31,6% Yes	61,5% Yes	39,3% Yes	100% Yes	40% Yes	25% Yes	26,7% Yes
	68% No	33,3% No	100% No	68,4% No	38,5% No	60,7% No	0% No	60% No	75% No	73,3% No

Occupation of respondents: according to respondent's results, health professionals were 96, 4%" yes" and 3, 6%" No".

Experience of participants: results show that participants from 0 to 5 years were 91, 7%" yes" and 8, 3%" no".

A nurse who use PC while performing duty is at risk

Gender of respondents: table 4.5.5 indicated that female respondents answered 16%" yes" and 84%" No" whereas male respondents answered 0% "yes" and 100% "No".
Age of respondents: about 5, 3% of respondents between 25 and 40 years indicated 5, 3%" yes" and 94, 7%" No". Above 40 years were 25%" yes" and 75%" No"

Occupation of respondents: results show that health professional's results indicated 7, 4%" yes" and 92, 6%" No". Allied workers were 0%" yes" and 100%" No". Housekeeper's results indicated 40%" yes" and 60%" No".
Experience of participants: according to the results, participants from 5 to 10 years were 13, 3%" yes" and 86, 7% "No".

It's not easy for the doctor who doesn't use protective clothing

Gender of participants: about 96% of female respondents answered" yes" and 4% "no" whereas male respondents were 100% yes and 0%" no".

Age of respondents: results show participants below 25 years and those between 25 and 40 years indicated 100%" yes" and 0%" no". Above 40 years were 92, 3% "yes" and 7, 7%" no".

Occupation of respondents: table 4.5.5 illustrates that health professionals were 96, 4% "yes" and 3, 6%" no". Allied workers were 100% "yes" and 0%" no". Experience of participants: table 4.3.8 display that participants from 5 to 10 years of experience results were 93, 3%" yes" and 6,7%" no".

Sterile hand gloves can be used twice from one patient to another

Table 4.5.5 illustrate that both respondents including gender, age, occupation and experience were 0% yes and 100% no.

Did you attend any workshop for PC?

Gender of respondents: about 32% female respondents answered "yes" and 68% answered "no" whereas 66, 7% of male respondents answered "yes" and 33, 3% answered "no".

Age of respondents: results of participants between 25 and 40 years were 31, 6% “yes” and 68, 4%” no.” Above 40 years were 61, 5%” yes” and 38, 5%” no”.

Occupation of respondents: according to results, health professionals were 39, 3% “yes” and 60, 7% “no”. Allied workers were 100% “yes” ad 0%” no”.

Experience of participants: table 4.5.5 results display those participants from 0 to 5 years; 25%” yes” and 75%” no” whereas those with experience from 5 to 10 years were 26,7% “yes” and 73,3% “no”.

Table 4.5.6: Agreeing and disagreeing with the use of protective clothing according to gender, age, occupation and experience

		Gender		Age		Occupation			Experience			
		Female	Male	Below 25yrs	Between 25 & 40yrs	Above 40yrs	Health prof.	Allied worker	House keeper	0-5 yrs.	5-10 yrs.	Above 10 yrs.
The use of PC in the Hospital reduces occupational disease	Strongly agree	72%	66,7 %	100%	76,7%	61,5 %	75%	100%	40%	66,7%	73,3%	71,4%
	Agree	24%	33,3 %	0%	26,3%	30,8 %	21,4%	0%	60%	25%	26,7%	28,6%
	Disagree	4%	0%	0%	0%	7,7%	3,6%	0%	0%	8,3%	0%	0%
N95 should only be used in contact with patient suffering from infectious disease	Strongly agree	44%	44,4 %	0%	36,8%	61,5 %	50%	0%	20%	25%	53,3%	57,1%
	Agree	40%	44,4 %	100%	36,8%	38,5 %	35,7%	100%	60%	66,7%	20%	42,9%
	Disagree	8%	11,1 %	0,%	15,8%	0%	7,1%	0%	20%	8,3%	13,3%	0%
	Strongly disagree	8%	0%	0%	10,5%	0%	7,1%	0%	0%	0%	13,3%	0%
Boots should be worn by theatre staff only	Strongly Agree	12%	0%	50%	5,3%	7,7%	10,7%	0%	0%	8,3%	13,3%	0%
	Agree	32%	11,1 %	0%	26,3%	30,8 %	17,9%	0%	80%	33,3%	26,7%	14,3%
	Disagree	32%	55,6 %	50%	31,6%	46,2 %	39,3%	100%	20%	41,7%	20%	71,4%
	Strongly disagree	24%	33,3 %	0%	36,8%	15,4 %	32,1%	0%	0%	16,7%	40%	14,3%
Safety goggle cause sore eyes	Strongly Agree	0%	0%	0%	0%	0,%	0%	0%	0%	0%	0%	0%
	Agree	40%	0%	100%	21,1%	30,8 %	28,6%	0%	40%	41,7%	33,3%	0%
	Disagree	32%	55,6 %	0%	52,6%	23%	39,3%	0%	40,0%	41,7%	33,3%	42,9%

	strongly disagree	28%	44,4 %	0%	26,3%	46,2 %	32,1%	100%	20%	16,7%	33,3%	57,1%
Training of employees about PC should take place annually	Strongly agree	37,5%	33,3 %	100%	26,3%	41,7 %	37%	100%	20%	41,7%	26,7%	50%
	Agree	45,8%	44,4 %	0%	63,2%	25%	44,4%	0%	60%	41,7%	53,3%	33,3%
	Disagree	8,3%	0%	0%	0%	16,7 %	7,4%	0%	0%	8,3%	6,7%	0%
	Strongly disagree	8,3%	22,2 %	0%	10,5%	16,7 %	11,1%	0%	20%	8,3%	13,3%	16,7%

Table 4.5.6 results show frequency and percentage of participants for agreeing and disagreeing with the use of protective clothing while on duty according to gender, age, occupation and experience as follows:

The use of PC in the hospital reduces occupational disease.

Gender of respondents: results of participants on females were 72% strongly agree, 24% agree, 4% disagree while in males 66, 7% strongly agree, 33, 3% agree and 0% disagrees.

Age of respondents: about 100% of respondents below 25 years strongly agreed while none of them agreed nor disagreed. Between 25 and 40 years were 76, 7% strongly agreed, 26, 3% agreed while disagree and strongly disagree were 0%. Above 40 years were 61, 5% strongly agreed, 30, 8% agreed, 7, 7% disagreed while 0% strongly disagreed.

Occupation of respondents: results display with health professionals were as follows: 75% strongly agreed, 21, 4% agreed, 3, 6% disagreed while 0% strongly disagreed.
Allied workers were 100% strongly agreed while agree, disagree and strongly disagree had 0%. Housekeepers were 40% strongly agreed, 60% agreed while disagree and strongly disagree had 0%.

Experience of participants: results illustrate that experience of participants from 5 to 10 years had higher percentage of 73, 3% with strongly agree followed by experience of

about 10 years of 71, 4%. From 5 to 0 years' experience had 8, 3% of disagree while strongly disagree had 0% in all experiences.

Gender of respondents: table 4.5.6 display female results that 44% strongly agreed, 40% agreed, 8% disagreed and also 8% strongly disagreed. In males results were 44, 4% strongly agreed, 44, 4% agreed, 11, 1% disagreed while 0% strongly disagreed.

Age of respondents: results of participants below 25 years indicated that 0% strongly agreed, 100% agreed while disagree and strongly disagree were 0%.Between 25 and 40 years were 36,8% strongly agreed,36,8% agreed,15,8% disagreed and 10,5% strongly disagreed. Above 40 years indicated that 61, 5% strongly agreed, 38, 5% agreed while disagree and strongly disagree were 0%.

Occupation of respondents: table 4.5.6 illustrates occupation of respondents were: health professionals (50%) strongly agreed, (35, 7%) agreed, (7, 1%) disagreed while (7, 1%) also disagreed. Allied workers (0%) strongly agreed, (100%) agreed while disagree and strongly disagree had 0%.

Experience of respondents: results of respondents display that the highest percentages were 66, 7% agreed for above 10 years' experience followed by 57, 1% strongly agreed and lastly disagrees and strongly disagrees which had 0%.

Boots should be worn by theatre staff only.

Gender of respondents: the results show that 12% of female respondents strongly agreed, 32% agreed, 32% disagreed while 24% strongly disagreed. Males respondents indicated 0% strongly agreed, 11, 1% agreed, 55, 6% disagreed and 33, 3% strongly disagreed.

Age of respondents: figure 4.5.6 display that results of respondents below 25 years were 50% strongly agreed, 0% agreed, 50% disagreed while 0% strongly disagreed. Between 25 and 40 years were 5, 3% strongly disagreed, 26, 3% agreed, 31, 6%

disagreed while 36, 8% disagreed. Above 40 years were 7, 7% strongly agreed, 30, 8% agreed, 46, 2% disagreed while 15, 4% strongly disagreed.

Occupation of respondents: the highest percentages in strongly agree were health professionals with 10, 7%, followed by 80% agreed in housekeepers .Respondents who strongly disagreed were allied workers with 100% followed by 32,1% disagreed of health professionals.

Safety goggles cause sore eyes

Gender of respondents: results show that females were 0% strongly agreed, 40% agreed, 32% disagreed while 28% strongly disagreed. Males were 55, 6% disagreed, 44, 4% strongly disagreed while in strongly agree and agree were 0%.

Age of respondents: about 100% of respondents below 25 years agreed while in strongly agree, disagree and strongly disagree had 0%.Between 25 and 40 years were 0% strongly agreed, 21, 1% agreed, 52, 6% disagreed while 26, 3% strongly disagreed. Above 40 years were 0% strongly agreed, 30, 8% agreed, 23% disagreed and 46, 2% strongly disagreed.

Occupation of respondents: table 4.5.6 illustrate that health professionals were 0% strongly agreed,28,6% agreed, 39,3% disagreed and 32,1% strongly disagreed. Allied workers were 100% strongly disagreed while in strongly agree, agree and disagree had 0%.

Experience of respondents: results of respondents from 0 to 5 years' experience show that 0% strongly disagreed, 41, 7% agreed, 41, 7%disagreed while 16, 7% strongly disagreed. Respondents above 40 years of experience indicated 42, 9% disagree, 57, 1% strongly disagree while strongly agree and agree had 0%.

Training of employees about PC should take place annually

Gender of respondents: about 37, 5% females strongly agreed, 45, 8% agreed while in disagree and strongly disagree had 8, 3%. Males were 33, 3% strongly agreed, 44, 4% agreed, 0% disagreed while 22, 2% strongly disagreed.

Age of respondents: results of below 25 years respondents' show that 100% strongly agreed while in agree, disagree and strongly disagree had 0%. Between 25 and 40 years indicated 26, 3% strongly agreed, 63, 2% agreed, 0% disagreed while 10, 5% strongly disagreed. The highest percentages for above 40 years were 50% strongly agreed.

Occupation of respondents: the results in table 4.5.6 show the highest number of percentages of health professionals were 44, 4% agreed. In allied workers, results indicated 100% strongly agreed while in agree, disagree and strongly disagree had 0%.

Experience of participants: results show 0 to 5 years' experience of participants in strongly agree and agree were 41, 7% while disagree and strongly were 8, 3%. Above 10 years were 50% strongly agreed followed by 33, 3% agreed.

4.5.7: Frequency and percentage table for participants who agree and disagree with the use of PC while on duty.

		Frequency	Percentage
The use of PC reduces occupational diseases	Strongly agree	144	70,6%
	Agree	54	26,5%
	Disagree	6	2,9%
	Strongly disagree	0	0%
Boots should be worn by theatre staff only	Strongly agree	90	44,1%
	Agree	84	41,2%
	Disagree	18	8,8%
	Strongly disagree	12	5,9%
N95 mask should only be used during contact with patients suffering infectious disease	Strongly agree	90	44,1%
	Agree	84	41,2%
	Disagree	18	8,8%
	Strongly disagree	12	5,9%

Table 4.5.7 show results frequency and percentage for the participants who agree and not to agree with the use of protective clothing while on duty as follows:

The use PC reduces occupational diseases: results show 144(70, 6%) strongly agreed, 54(26, 5%) agreed while 6(2, 9%) disagreed with the statement.

Boots should be worn by theatre staff only: figure 6.1 display that 90(44, 1%) strongly agree, 84(41, 2%) agree, 18(8, 8%) disagree while 12(5, 9%) strongly disagree. N95 masks should only be used in contact with patients suffering from infectious disease: 90(44, 1%) strongly agreed with the statement.

Table 4.5.8:Chi-square results of negative health symptoms versus gender, age, occupation and experience.

Pearson Chi-Square Tests					
		Gender	Age	Occupation	Experience
Negative health symptoms during use of PC	Chi-square	15.621	12.866	35.211	44.898
	Df	3	6	6	6
	Sig.	.001	.045	.000	.000

In table 4.5.8: Pearson chi-square tests shows that the result of demographic data against the question “negative heath symptoms during use of pc”. the results show that the p-value (0.01) of gender is less than the chosen significant level (0.05) which implies that there is a statistical significant relationship between gender and the variable “negative heath symptoms during use the of pc”. Furthermore, age was also test against the same variable. It also shows that there is a statistically significant association between ages and “negative heath symptoms during use of pc” the same test provided the same results about their association with the variable in question.

Table 4.5.9: Pearson Chi-Square Tests

		Gender	Age	Occupation	Experience
The use of latex gloves	Chi-square	3,327	1,555	2,839	9,809
	Df	1	2	2	2
	Sig	.068	460	.242	007
Body itching caused by PC	Chi- square	6,442	62,609	13,696	11,717
	Df	1	2	2	2
	Sig	.011	.000	.001	003
Respiratory reaction caused by PC	Chi-square	1,375	7,192	4,848	7,137
	Df	1	2	2	2
	Sig	.241	.027	.089	.028
Hyper-Sensitivity	Chi-square	7,112	2,538	47,793	3,536
	Df	1	2	2	2
	Sig	.008	.281	.000	.171
Non-compliance	Chi-square	1,656	2,627	9,077	23,370
	Df	1	2	2	2
	Sig	.198	.269	.011	.000
Action after reaction	Chi-square	13,647	10,177	72,540	38,884
	Df	3	6	6	6
	Sig	.033	.117	.000	.000

Pearson Chi-square test were conducted to examine the allergic reactions versus gender, age, occupation and experience.

The use of latex gloves:

A Chi-square analysis was conducted to examine whether there were relationships between various demographic characteristics and the allergic reactions regarding the use of latex gloves among health care workers. Table 4.5.9 shows gender, age, occupation and experience are all significantly related to participants on the use of latex gloves while on duty. Health care workers gender, age, occupation and experience determine their level of allergic

Body itching caused by PC:

To determine whether some demographic factors cause allergic reactions related to protective clothing to participants, we conducted a Chi-square analysis to answer the question. The results show that gender, age, occupation and experience are all significantly related to participants with allergic reactions on body itching regarding the use of protective clothing.

Respiratory reaction caused by protective clothing:

Demographic factors also determine the allergic reactions on participants regarding the use of protective clothing. According to the Chi-square analysis which was conducted, the results indicated that gender, age, occupation and experience are shown to be statistically not having any influence on the dependent variable.

Participants' age (Table 4.5.9) and experience determine allergic reactions related respiratory problem regarding the use of protective clothing; age (sig= .000) whereas experience (sig=.028), respectively. Allergic reactions related to protective clothing does not depend on demographic factors.

Hypersensitivity:

A Chi-square analysis was conducted to examine the relationship between various demographic characteristics and allergic reactions regarding the use of protective clothing. Table 4.5.9 shows that occupation is insignificantly related to participants' allergic reactions regarding the use of protective clothing while age shown to be statistically significant to the dependent variable.

Table 4.5.10: Chi-Square Test

The use of PC in hospitals reduces transmission of occupational diseases	Chi-square	3,627	15,945	22,404	11,387
	Df	2	4	4	4
	Sig	.163	.003	.000	.023
N95 should only be used during contacts with patients suffering from infectious diseases	Chi-square	4,948	46,456	24,647	51,504
	Df	3	6	6	6
	Sig	.176	.000	.000	.000
Boots should be worn by theatre staff only	Chi-square	20,094	42,997	62,844	40,783
	Df	3	6	6	6
	Sig	.000	.000	.000	.000
Safety goggles cause sore eyes	Chi-square	30,681	48,300	15,220	31,002
	Df	2	4	4	4
	Sig	.000	.000	.004	.000
Retraining of employees about PC should take place annually	Chi-square	10,945	60,949	18,138	11,770
	Df	3	6	6	6
	Sig	.012	.000	.006	.067

To examine whether some participants agree or disagree on the use of protective clothing, a Pear Chi-square analysis was conducted to answer the question.

The use of PC in hospitals reduces the transmission of occupational diseases

A pear Chi-square analysis was conducted to examine participants who agree and disagree with the reduce of transmission of occupational disease while using PC in hospitals. Table 4.5.10 indicated age (.003), occupation (.000) and experience (.023) are all significantly related to the reduce of transmission of occupational disease.

To examine whether participants agree or disagree with the use of N95 mask should only be in contact with patients suffering from infectious disease or not, Pearson Chi-square tests were conducted. The results revealed that there were significant relationships between the variables which were tested at p<.000.

Boots should only be worn by theatre staff only.

The results show a significant association between agreeing and disagreeing of boots with the use of PC with respondents. Table 4.5.10 is an extract of those pairs of variables.

Safety goggles cause sore eyes

There was a significant association between age range and experience of participants: p<.004. Comparatively, 89% of respondents below 25 years were likely to agree about sore eyes caused by safety goggles, 68, 1% of the respondents above 25 years who confirmed disagree.

Retraining of employees about PC should take place annually

Respondents' gender and occupation determines their respond regarding retraining of employees annually are significantly related to PC (p<.006). Gender and occupation are all significantly related to annually retraining of employees related to protective clothing. Table 4.5.10 are shown to be statistically not having any influence on the dependant variable.

Table 4.5.11: Pearson Chi-Square Tests on the use of PC.

			Gender	Age	Occupation	Experience
Protective clothing helps prevent cross infection	Chi-square		2,225	9,986	1,325	11,333
	Df		1	2	2	2
	Sig		.136	.007	.516	.003
	A nurse who uses PC while performing duty is at risk	Chi-square	8,739	17,900	26,097	1,792
		Df	1	2	2	2
		Sig	.003	.000	.000	.408
It is easy for the doctor who doesn't	Chi-square		2,225	9,986	1,325	7,830

use PC while examining a patient	Df	1	2	2	2
	Sig	.136	.007	.516	.020
Sterile hand gloves can be used twice from one patient to another	Chi-square	0	0	0	0
	Df	0	0	0	0
	Sig	0	0	0	0
Did you attend any workshop for PC	Chi-square	19,701	26,087	8,837	75,601
	Df	1	2	2	2
	Sig	.000	.000	.012	.000

Pearson Chi-square test were conducted to examine the prevention of protective clothing versus gender, age, occupation and experience of the participants

Protective clothing helps to prevent cross infection

To examine whether some demographic factors influence the non-use of protective clothing among health workers, Pearson Chi-square analysis were conducted to answer the question. Gender and experience are all significantly related to participant's knowledge about protective clothing.

Participant's gender and experience determine their level of knowledge regarding protective clothing (*X2*=9, 986, p=0,007) and (*X2*=11, 333, p=0,003), respectively.

A nurse who uses PC while on duty is at risk

A Chi-square was conducted to examine various demographic characteristics regarding the use of PC. Gender is insignificantly related to participant's knowledge regarding the use of protective clothing (*X*2=8, 739, p=0,003).

It's easy for the doctor who doesn't use protective clothing while examining a patient.

Respondents' age, occupation and experience determines their respond regarding the doctor who doesn't use protective clothing while examining the patient. Conversely, knowledge regarding the use of protective clothing is shown to be independent (X2=9, 986, p=0, 007, X2=1, 325, p=0,516 andX2=7, 830, p=0,020).

Did you attend any workshop for PC?

A Chi-square was conducted to examine attendance of workshops regarding the use of PC. Gender is insignificantly related respondent's knowledge regarding PC (X2=19, 701, p=0, 00).

4.6 CONCLUSION

This chapter presented, analysed and interpreted results based on the objectives of the study. A number of findings were made for each objective as stated above. These results are discussed in chapter 5.

CHAPTER 5

DISCUSSION OF RESULTS

5.1 Introduction

This chapter discusses the research findings and provides a conclusion based on the findings. This research study was intended to assess the use of protective clothing among health care workers in selected hospitals of the Vhembe District, in the Limpopo Province, South Africa.

Data was collected by the researcher using structured questionnaire. The items sourced data using a number of variables that could be used to determine the topical issues being researched.

5.2 Demographic data

Gender

The analysis in this study shows that female participants had the higher number of not using protective clothing while on duty than males (females 73,5%), (males 26,5%), which means that females health care workers are the ones who are not complying on

the use of protective clothing than males. They need to be considered for attending workshops on protective clothing. In a study conducted by Wynn (2015:679), gender was found to be associated with infectious diseases with females experiencing it more than males due to non-use of protective clothing.

Age

The study found that participants between the age of 25 and 40 do not use protective clothing while on duty, whereas those below the age of 25 are the ones who comply. Below 25 years (5,88%), between the age of 25 to 40 years (55,88%) and above 40 years (38,24%).This simply tells us that health care workers of younger age uses protective clothing than older ones. This finding is similar to other studies as that conducted in Canada that found the non-use of protective clothing among health care workers was significantly higher among health care workers between the age of 40 and 49 than other ages (Pear, 2011:77). A similar study conducted in France, Lehman (2012:58) found a direct increase in non-use of protective clothing with increase of age.

Marital status of participants

The study found that 58,8% of married participants are using protecting clothing while on duty whereas 41,2% are single. This simply tells us that married participants are the ones who comply than those who are unmarried. This perception is corroborated by the findings of a study by Bugajska, Szmauz-Dybko, and Soltynski, (2012:56) who identified several married health care workers who do not use protective clothing while on duty.

Race group of the participants

This study shows that Africans are the ones who do not comply on the use of protective clothing than other race groups. The results shows that 93, 95% were African coloured 3, 03% and 3, 03% of Indian. These results demonstrated that Africans had a bad attitude towards protective clothing compared to other race groups. A similar conclusion was reached in Hutchinson's study (2011:542). He found that Australian health care workers generally did have a problem of not using protective clothing due to their

cultural believe. He also found that health care workers who had attitude due to their race had problems fully understanding and complying.

Sections in which participants are working

The study shows that 58, 82% of participants who work in nursing section were found to be a higher number of experiencing much problem regarding protective clothing while on duty than other sections. 14, 71% were clinical services, 2, 9% allied services, 11, 76% dental and also 11, 76% of housekeeping. The above results generally demonstrated that health care workers from nursing sections increase the number of non-use of protective clothing. In a study conducted by Beck, (2012:907), in the United States, at the University of Washington, participants from the laundry section were found to be higher compared to other sections.

Health status of the participants

With reference to fig 4.3.1.6 most of the participants about 35% have shown excellent health status and also 35% are in good health. This simply tells us that any sickness that may occur can be used by non-use of protective clothing while on duty. Of the 35, 29% with excellent and very good health status indicated that the use of protective clothing while on duty also contributed a lot on their health as they are always at risk at their workplace. A number of studies have looked into the risk of health care workers health regarding protective clothing. These same studies have shown that many health care workers have poor health status due to non-use of protective clothing while on duty as leaded them into being infected (Garg & Tjissen, 2009:117; Institution of Medical Report, 2012:66; Marciniak, 2013:308).

Occupation of participants

The results of occupation in this study shows that health professionals were the highest number with a percentage of 82, 4%, followed by housekeeping staff with 14, 7 % and

allied workers also with 2, 9%.The correlation between these factors simply shows that health care workers with post matric qualifications knew more about the use of protective clothing than the workers who had no post matric qualifications. In Britain, a study conducted by Duchtsher and Lawrence (2012:119) regarding protective clothing indicated that 68, 1% of health care workers who were doctors comply than other health care workers

Experiences of the participants

Pertaining to knowledge of protective clothing and the use thereof, 5 to 10 years of experience (44,1%) of the participants at the selected hospitals reported that through their experiences being health care workers they never seen any importance of using protective clothing while on duty, 35,3% were 0 to 5 years and 20,6% of above 30 years. The majority of health care workers also affirmed that experiences of being in the field cause them not to comply. This is in contrast with Loosli (2012:95) whose assessment of workers demonstrated the indifferent experience concerning protective clothing.

5.3 Negative health symptoms during the use of protective clothing

The study found that 14, 7% of the participants in selected hospitals viewed themselves as being generally irritable respiratory and skin problem when using protective clothing while on duty.19, 5% of participants also indicated body reaction problem. 94, 9% did not view themselves as irritable in the use of protective clothing. This simply shows that majority of the participants are non-users of protective clothing due to ignorance. The study also found 16, 0% of females experience respiratory problems when using protective clothing whereas male had 11, 1%. It also shows that females were the ones being affected than males. This study also reveals that participants between the age of 25 and 40 had a higher percentage of 15, 8% of experiencing skin problem when using protective clothing than those below the age of 25 (0, 00%).This also shows us that the more a person getting old the higher the chance of being affected.

Results also shows that occupations of the participants also contribute on the negative health symptoms during the use of protective clothing. Health professionals had 25% on body reaction, whereas allied workers and housekeeping staff had 0, 00%, meaning that health care workers who work in contact with patients are more likely experiencing negative health symptoms. Garg and Tjisen (2011:412) also reported that health care workers who are more educated had more knowledge of negative health symptoms in agreement with this finding. The chi square results in the study shows that there is a statistically relationship between gender and age (001 at 045 significance)

5.4 Allergic reaction to protective clothing

This study shows that 36,3% of health care workers were found to be suffering from allergic reaction by wearing protective clothing while on duty whereas 58,6% were not. Participants in this study also reported that protective clothing helps because; prior to protective clothing they were unable to protect themselves from infections which show the effectiveness of protective clothing to health care workers. This of course may mean that the disparity in lack of knowledge about protective clothing may not be associated to any allergic reaction but may be a general problem.

It was also found that the use of latex gloves causes allergic reactions to many participants (93, 9%) followed by hypersensitivity (87, 9%). It was also found that period of working experience also contribute to allergic reactions of the participants; participants who experienced body itching with higher percentage were between the period of 5 to 10 years, 83,3%) ,0 to 5 years (81,8%). However, in similar studies conducted in Kenya (Ruhan and Bernard (2010:321) allergic reactions were found in powdered gloves. A number of studies have looked into the non-use of personal protective clothing among health care workers. These same studies have shown that the non-use of protective clothing among health care workers increases significantly with an increase in the number of health care workers suffering from allergic reaction (Walley, Chang and Kuo, 2011:97-102).

In studies Edington and Norgbe (2010:216); Hendrik, Snieder and Gilbert (2011:325) that have evaluated the non-use of protective clothing, it was determined that the

environment`s proposed contribution to allergic reaction development is not as meaningful as initially thought. Because of this, it has been suggested that some of protective clothing`s role in the development of allergy must be a significant one. The chi square results in this study shows that there is a statistically significant relationship between occupation and experience (001 at 003 significance)

5.5 Importance or prevention of protective clothing

According to the participants in this study, it was found that protective clothing helps to prevent cross infection while on duty. The participants who support the importance or prevention of protective clothing shows to more than those who do not; Yes (97, 1% and those who said No (2, 9%). It was also found that most of participants had knowledge according to the use of protective clothing as none of them indicated that sterile gloves can be used twice from one patient to another. It was found that most of participants do not understand the importance and prevention of protective clothing due to lack of workshop attendance in their institutions; results shows that the number of those who attended workshops regarding protective clothing was lower than those who never attended, Yes (41,2%) and No (58,8%).

The Occupational Safety & Health Administration (OSHA, 2012:78) requires the use of protective clothing to reduce employee exposure to hazard, this also confirm the importance of protective clothing among health care workers while on duty. Lehman, Herm and Gerick (2012:809) also found that many health care workers don't understand the importance of protective clothing while on duty.

The study again found that male participants were the ones who understand the prevention and importance of protective clothing than females, this was shown on the results of frequency table where males obtained 100% whereas females obtained 96, 0%. It was also shown that occupation also contribute to the use of protective clothing regarding the risk which may occur to none users. Housekeeping staff were shown to be the participants who understood the risk of not using protective clothing while on duty; health professionals (7, 4%), allied workers (0, 0%) and housekeeping staff (40,0%). A similar conclusion was reached by Marciniak (2013:90). He found that Italian

health care workers did not have understanding with the risk of not using protective clothing while on duty. The chi square test showed significant statistical association about the risk of not using protective clothing between gender and age (003 at 000 significance)

5.6 Agreeing and disagreeing of the participants on the use of protective clothing

The analysis in this study shows that the participants who agree on the use of protective clothing had higher percentage than those who disagree; as shown in the results, 70,6% strongly agree, 26,5% agree and 2,9% disagree. This simply mean that majority of health care workers do agree that protective clothing prevents infection. However, there were other participants who indicated that some of protective clothing like eye goggles causes sore when they use them as it was also shown in the results; strongly agree was zero, agree 29,4% and disagree 38,2%. These results demonstrated that some of participants disagreed due to the challenges which they come across during the use of protective clothing.

This is in contrast with Werner and Smith (2010:87) whose assessment of health care workers on protective clothing indicated that they also agree with the use of protective clothing while on duty. It was also found that females' participants had a higher percentage on the use of protective clothing than males; female strongly agree 72,0% whereas male strongly agree was 66,7% meaning that females comply with the use of protective clothing than males. Results also shows that occupation of participants also contribute on the agreement and disagreement of using protective clothing; health professionals 75, 0% whereas housekeeping staff was 40, 0%. It is therefore reasonable to conclude that occupation of the participants also contribute on agreeing and disagreeing on the use of protective clothing.

This perception is corroborated by the findings of the study by Strachota and Lorbergs (2013:703) that identified Allied workers who do not agree with the use of protective clothing in Europe. The chi square results in the study shows that there is a statically significant relationship between age and occupation (000 at 003 significance).

According to the Health believe theoretical framework, the following aspects were load into; preventing sickness, perception, and personal action and consequences and precautional measures.

5.7 SUMMARY

This chapter presented the discussion of results in demographic data, negative health symptoms during the use of protective clothing, importance of protective clothing and agreeing and disagreeing of the participants on the use of protective clothing.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This is the final chapter of the study “the use of protective clothing among health care workers in selected hospitals of the Vhembe district in the Limpopo Province, South Africa” it comprises the conclusion and recommendations of the study. The objectives of this study namely to:

- Assess of the the use of protective clothing among health care workers in the Vhembe District Hospitals.
- Describe the perceived challenges of non-use of protective clothing faced by health care workers in the Vhembe District Hospitals were achieved through the questionnaire used in data collection. In this chapter conclusions and recommendations were drawn in line with the latter specific objectives of the study that would inform actions to be taken.

6.2 Conclusion

This section marks the conclusion of this study where a cross-sectional study was conducted in selected hospitals of the Vhembe District in the Limpopo Province, South Africa, to determine the non-use of protective clothing among health care workers. The the use of protective clothing among health care workers in selected hospitals of Vhembe district was measured and the environmental risk factors for the use were also identified.

The present study reached the following conclusion:

- The participants displayed poor use of protective clothing as 65% was found to be high among health care workers in the selected hospitals of the Vhembe District in the Limpopo province, South Africa. However, there are critical aspects in their responses that could imply lack of knowledge, negative attitudes and bad practices in the use of protective clothing on duty. This could also imply lack of knowledge on the consequences of non-use of this protective clothing that could be detrimental to their personal health.

- Participants in this study displayed allergic reactions to protective clothing which was more problematic amongst health care workers; accounting for 38,2% followed by unavailability of protective clothing 30.0% then 10.0% ignorance. This might have accounted to scaling up of absenteeism due to occupational health problems amongst health care workers. Furthermore, participants in this

study from the study hospitals revealed that there is shortage of protective clothing that my account to participants having no choice to alternative protective clothing.

- Finally the study revealed an association between the the use of protective clothing and the following: biographic data (gender and age), occupation (types of work), and health status. Furthermore, the association showed that participants of certain age and gender were mostly affected with the non-use of protective clothing in the health care institutions.

6.3 Recommendations

Based on the findings of this study, the following recommendations were made:

- Screening for infectious disease among health care workers must be made mandatory, intensified and form part of the workshops in the hospitals. There is need for increase trainings regarding the importance of using protective clothing and the risk of non-use of protective clothing among health care workers in the hospitals.
- The Department of Health must encourage cooperation between the hospitals and occupational health and safety in order to integrate and regularly evaluate the infectious disease screening program to ensure total coverage for health care workers in selected hospitals.
- The Department of Health should also provide the hospitals with protective clothing for safety of health care workers while on duty and increase budget in their use.
- There is a need to increase the training of occupational health and safety staff in hospitals to ensure that the service is always available in case where another employee is on leave.
- Different types of protective clothing should be provided to prevent allergic reactions from protective clothing such as powdered and unpowered gloves.

- Further research addressing methods of intervention of the problem in selected hospitals is needed.

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APPENDICES

Appendix 1: QUESTIONNAIRE

Instructions

- Please read carefully and answer all questions (e.g. by making a cross in the correct box).
- Do not write your name or number.
- Do not converse with anybody.
- Please, feel free to contact me if you experience any difficulties with filling in the questionnaires.

Biographic data

1. Gender

☐ Female

☐ Male

2. How old are you?

☐ Below 25 years

☐ Between 25 and 40 years

☐ Above 40 years

3. Marital status

☐ Married

☐ Single

4. Race group (Mark with an X)

African	White	Coloured	Indian	Other

5. What is your occupation?

☐ Health professional

☐ Allied worker

☐ House keeping

6. For how long have you been employed?

☐ 0 to 5 years

☐ 5 to 10 years

☐ Over 10 years

7. In which section are you working?

☐ Nursing

☐ Clinical service

☐ Allied

☐ Dental

☐ House keeping

Indicate with an X below your answer

8. In general, how would you say your health is?

Excellent	Very good	Good	Fair	Poor

ASSESSMENT OF USE OF PROTECTIVE CLOTHING

Indicate with an X below your answer

9. What types of protective clothing which you have in the hospital?

Gowns	Eye goggles	Aprons	Masks	Hand gloves	Boots

10. What is the reason for not wearing protective clothing while on duty?

Not available	Not used	Develop rash	No reason

11. A nurse who use protective clothing while performing duty is at risk

Yes	No

12. Protective clothing helps to prevent cross infection

Yes	No

13. It is not easy to the doctor who doesn't use protective clothing while examining a patient

Yes	No

14. Sterile hand gloves can be used twice from one patient to another

Yes	No

15. Did you attend any workshop for protective clothing?

Yes	No

16. The use of protective clothing reduces occupational diseases

Strongly agree	Agree	Disagree	Strongly disagree

17. Boots should be worn by theatre staff only

Strongly agree	Agree	Disagree	Strongly disagree

18. N95 mask should only be used during contact with patients suffering infectious disease

Strongly agree	Agree	Disagree	Strongly disagree

CHALLENGES ON THE USE OF PROTECTIVE CLOTHING

19. Indicate with an X any negative health symptoms you are experiencing during the use of protective clothing while on duty

- ☐ Respiratory problem
- ☐ Skin problem
- ☐ Body reaction
- ☐ Other

Indicate an answer with an x from the table below

20. Are you allergic to any of the following: pollens, latex or medicines?

Yes	No

21. Do you suffer from any of the following skin problem?

	Yes	No
Eczema		
Ringworm		
Skin cancer		

Choose any reaction (side effects) caused by protective clothing by indicating with a circle from the following answer below.

22. The use of latex gloves causes

1. Rash
2. Swelling

23. Body itching is one of the reaction caused by

1. Gowns
2. Aprons

24. Respiratory reaction is quiet common in personnel working with protective clothing like

1. Surgical gloves
2. Surgical masks

25. Hypersensitivity reaction include

1. Bronchopneumonia
2. Nasal congestion

26. Non-compliance for the use of protective clothing lead to exposure to blood-borne infections by pathogens such as

1. Tuberculosis 2. Immunodeficiency virus

Appendix 2: Health care workers Information Letter

Assessment of the non-use of protective clothing among health care workers in selected hospitals of Vhembe district in Limpopo province.

Date:

Dear Health care worker

I, Mukhawa Cecilia, a qualified professional nurse and a Master of Nursing student from the University of Venda, would like to include you in a research project on **assessment non-use of protective clothing among health care workers in selected Hospitals of Vhembe district, Limpopo province.**

Your participation in this project is completely voluntary. In addition to your permission, you will also be asked if you would like to take part in the project. Only if you want to participate you will do so and you may stop taking part at any time.

You are free to withdraw your permission for any reason without penalty. These decisions will have no effect on your future relationship with your hospital. The information that will be obtained during the research project will be kept strictly confidential and will not become part of your hospital.

Any sharing or publication of the research results will not identify any of the participants by name. We look forward to working with you. I think that this research will be beneficial to you because if you have any problem concerning non-use of protective clothing while on duty you will be referred to relevant section in your hospital for further management. This study will enable us and the department of health to establish relevant strategies to eliminate these problems of not using protective clothing.

If you have any questions about the project, please contact me using the information below.

Please keep the attached copy of this letter for your records.

Sincerely, (signature)

(Signature) Dr Ramakuela N.J

Mukhawa C 0824066574

0824867095

Email: cmukhawa@gmail.com

****

Appendix 3: Consent form

Assessment of the non-use of protective clothing among Health care workers in selected Hospitals of Vhembe District in Limpopo Province.

Name: Mukhawa Cecilia,

Position: Professional nurse at the Department of Health, Louis Trichardt Memorial Hospital, in Vhembe District.

Cell: 0824867095

Email: cmukhawa@gmail.com

I confirm that I have read and understand the information sheet for the above study on assessment of the non-use of protective clothing among heath care workers in selected hospitals of Vhembe district in Limpopo province, and have had opportunity to ask questions. I also understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason. I agree that I take part in the above study.

_____	_____	_____
Name of a participant	Date	Signature
_____	_____	_____
Witness	Date	Signature
_____	_____	_____
Researcher	Date	Signature

Appendix 4: Letter to Department of Health

47 Leeu Street
Louis Trichardt
0920

Head of Department

Department of Health, Limpopo

Private Bag x9302

POLOKWANE

0700

REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN HOSPITALS

Dear sir /madam

My name is Mukhawa Cecilia, and I am a Master of Nursing student at the University of Venda, School of Health Sciences. The research I wish to conduct for Masters is entitled **Assessment of the non-use of protective clothing among health care workers in selected Hospitals of Vhembe District ,Limpopo Province.**

This project will be conducted under the supervision of Dr Ramakuela N.J (supervisor) and Dr Nemathaga L.H (co-supervisor).

I hereby wish to seek your consent to approach a selected number of hospitals in the Vhembe District, Limpopo Province to provide participants for the project.

I have provided you with a copy of my dissertation proposal which includes copies of the measure, consent and data collection forms to be used in the research process, as well as a copy of the approval letter which I received from the Research Ethics Committee of the University of Venda.

Upon completion of the study, I undertake to provide the Department of Health with a bound copy of the full research report. If you require any further information, please do not hesitate to contact me at 0824867095 or the following email:cmukhawa@gmail.com.

Thank you for your time and consideration in this matter.

Yours sincerely

Appendix 5: Letter to the Hospital

47 Leeu street Louis Trichardt

0920

The Chief Executive Officer

Louis Trichardt Hospital

Private Bag x2417

Louis Trichardt 0920

REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN YOUR HOSPITAL

Dear Sir/Madam

My name is Mukhawa Cecilia, and I am a master of nursing student at the University of Venda, school of Health Sciences. The research I wish to conduct for my masters involves “Assessment of the non-use of protective clothing among health care workers in selected hospitals of Vhembe District in Limpopo province”. This project will be conducted under the supervision of Dr Ramakuela N.J (supervisor) and Dr Nemathaga L.H (co-supervisor).

I am hereby seeking your consent to approach selected number of hospitals in the Vhembe District, Limpopo province to provide participants for this project. I have provided you with a copy of my dissertation proposal which includes copies of the measure, consent and data collection forms to be used in the research process, as well as a copy of the approval letter which I received from the Research Ethics Committee of the University of Venda.

Upon completion of the study, I undertake to provide the Department of Health with a bound copy of the full research report. If you require any further information, please do not hesitate to contact me on 0824867095 or email to cmukhawa@gmail.com.

Thank you for your time and consideration in this matter.

Yours sincerely,

Mukhawa C

Appendix 6: Letter to the Hospital

47 Leeu street Louis Trichardt

0920

The Chief Executive Officer

Siloam Hospital

Private Bag x2432

Louis Trichardt 0920

REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN YOUR HOSPITAL

Dear Sir/Madam

My name is Mukhawa Cecilia, and I am a master of nursing student at the University of Venda, school of Health Sciences. The research I wish to conduct for my masters involves “Assessment of the non-use of protective clothing among health care workers in selected hospitals of Vhembe District in Limpopo province”. This project will be conducted under the supervision of Dr Ramakuela N.J (supervisor) and Dr Nemathaga L.H (co-supervisor).

I am hereby seeking your consent to approach selected number of hospitals in the Vhembe District, Limpopo province to provide participants for this project. I have provided you with a copy of my dissertation proposal which includes copies of the measure, consent and data collection forms to be used in the research process, as well

as a copy of the approval letter which I received from the Research Ethics Committee of the University of Venda.

Upon completion of the study, I undertake to provide the Department of Health with a bound copy of the full research report. If you require any further information, please do not hesitate to contact me on 0824867095 or email to cmukhawa@gmail.com.

Thank you for your time and consideration in this matter.

Yours sincerely,

Mukhawa C

Appendix 7: Letter to the Hospital

47 Leeu street Louis Trichardt

0920

The Chief Executive Officer

Tshilidzini Hospital

Private Bag x924

Shayandima 0945

REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN YOUR HOSPITAL

Dear Sir/Madam

My name is Mukhawa Cecilia , and I am a master of nursing student at the University of Venda, school of Health Sciences. The research I wish to conduct for my masters involves “Assessment of the non-use of protective clothing among health care workers in selected hospitals of Vhembe District in Limpopo province”. This project will be conducted under the supervision of Dr Ramakuela N.J (supervisor) and Dr Nemathaga L.H (co-supervisor).

I am hereby seeking your consent to approach selected number of hospitals in the Vhembe District, Limpopo province to provide participants for this project. I have provided you with a copy of my dissertation proposal which includes copies of the measure, consent and data collection forms to be used in the research process, as well as a copy of the approval letter which I received from the Research Ethics Committee of the University of Venda.

Upon completion of the study, I undertake to provide the Department of Health with a bound copy of the full research report. If you require any further information, please do not hesitate to contact me on 0824867095 or email to cmukhawa@gmail.com.

Thank you for your time and consideration in this matter.

Yours sincerely,

Mukhawa C

Appendix 8: Letter of language editor

Dr Catherine Hutchings

Freelance Editorial Services

51 Bathurst Road

Kenilworth

7708

Cape Town

Western Cape

South Africa

Telephone/Fax: + 27 21 7618522

Mobile: + 27 82 9702219

E-mail: catherinehutchings@gmail.com

To whom it may concern.

I hereby confirm that I edited

CECILIA MUKHAWA's

BCur thesis

Title:

ASSESSMENT OF NON-USE OF PERSONAL PROTECTIVE CLOTHING AMONG HEALTH CARE WORKERS IN SELECTED HOSPITALS OF THE VHEMBE DISTRICT IN THE LIMPOPO PROVINCE, SOUTH AFRICA.

in May 2018.

I wish this student well in their endeavours.

Catherine Hutchings

Appendix 9: Ethical clearance

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Ms C Mukhawa

Student No:
15018006

PROJECT TITLE: **Assessment of non-use of protective clothing among health care workers in selected hospitals of Vhembe District in Limpopo Province, South Africa.**

PROJECT NO: SHS/16/PDC/39/1502

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr NJ Ramakuela	University of Venda	Supervisor
Dr LH Nemathaga	University of Venda	Co- Supervisor
Ms C Mukhawa	University of Venda	Investigator – Student

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: February 2017
Decision by Ethical Clearance Committee Granted
Signature of Chairperson of the Committee: .....
Name of the Chairperson of the Committee: Prof. G.E. Ekosse

UNIVERSITY OF VENDA
DIRECTOR
RESEARCH AND INNOVATION
2017 -02- 17
Private Bag X5050
Thohoyandou 0950

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