

**AN INVESTIGATION INTO THE KNOWLEDGE AND COMPLIANCE WITH
STANDARD PRECAUTIONS AMONGST NURSES
IN TYGERBERG HOSPITAL IN THE WESTERN CAPE**

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KEYWORDS

- Standard precautions
- Blood-borne pathogens
- Nurses
- Knowledge
- Compliance
- Body fluids
- Needle prick injuries
- Blood specimens
- Universal precautions
- Infection control



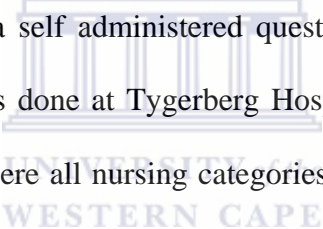
ACCRONYMS

- HIV- Human Immunodeficiency Virus
- AIDS- Acquired Immune Deficiency Syndrome
- SPSS- Statistical Package for Social Sciences
- HBV- Hepatitis B virus
- UP- Universal Precautions
- WHO- World Health Organization
- PPE- Personal Protective Equipment



Abstract

Everyday thousands of nurses are rendering bedside nursing care in health care settings as a result they are exposed to blood, body fluids and sharp objects that are contaminated with Hepatitis B, Hepatitis C and HIV. Therefore they are at risk of getting infected. In 1996, standard precautions were implemented by the Centre of Disease Control to reduce the risk of transmission of micro-organisms from any source of infection in the hospital. In the year 2008, the three tertiary hospitals together in the Western Cape reported that they had 733 needle prick injuries. Therefore the aim of the study was to determine if nurses comply with and have adequate knowledge of standard precautions.



A non-experimental design and a self administered questionnaire were used to collect the data for the study. The study was done at Tygerberg Hospital and the participants (n=143) that were involved in the study were all nursing categories (professional, enrolled nurse and auxiliary nurse). Stratified random sampling was used to ensure that there was a representation of all the nurses working in the different modules at Tygerberg Hospital. Therefore three wards were randomly selected from each module and all the nurses on duty working in the three selected wards were given a questionnaire by the Assistant Director of the specific module. After the data was collected it was analysed through the statistical package for social sciences.

The findings of the study showed that nurses have inadequate knowledge regarding standard precautions and the mean score of the nurses overall self reported compliance of standard precautions was 87.5%. The results also showed that when patients are HIV positive nurses

intend to over comply the use of personal protective equipment. No association was found between the nurses' knowledge and compliance regarding standard precautions.

It is therefore important that every nurse should be educated about the basic principles of standard precautions and also the policies and protocols of infection control in order to prevent each nurse from getting infected. Training needs to be implemented starting in the wards through the unit manager to improve all the nurses' knowledge and practice.



Declaration

I declare that *An investigation into the knowledge and compliance with standard precautions amongst nurse' in Tygerberg Hospital in the Western Cape* is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Full name: Joanneil Merl Duminy

Date: November 2010

Signed:



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I would first of all like to thank the Lord Jesus for giving me the guidance and strength to complete this degree. “My redeemer lives”

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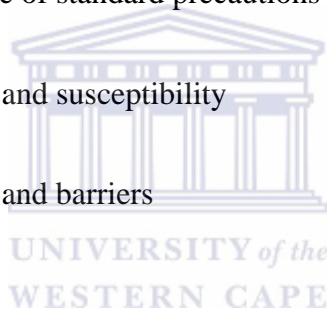
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CHAPTER ONE

Introduction

1.1 Background

In South Africa, 5.7 million people are infected with HIV/AIDS, and almost 1000 people die every day due to AIDS (UNAIDS/WHO 2008). Ehlers (2006, p. 657), stated that, as the number of HIV positive people in any country increases, so do the chances for every health care worker in the country of being infected. Every day, thousands of nurses are being exposed to blood, body fluids that contain blood products, used needles, scalpels and other sharps objects in hospital wards (obstetrics, general, emergency), clinics and theatres. In health care services, nurses are particularly at risk of being exposed to blood and sharp devices because they perform more bedside nursing care and procedures than any other health care worker (Wang, Fennie, He, Burgess & Williams, 2005, p. 187). According to Smit (2004, p.23), nurses are the group of care-givers who have regular and prolonged contact with patients. Nurses are thus at risk of being infected by blood-borne pathogens such as; Hepatitis B, Hepatitis C and HIV.

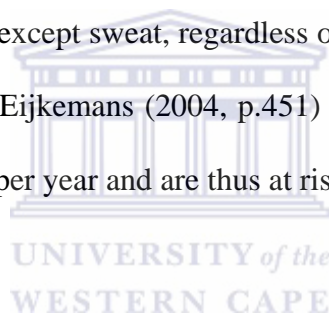
1.1.1. The Transmission of Blood Borne Pathogens: Hepatitis B can be transmitted through body substances such as blood, blood products, cerebrospinal fluid, amniotic fluid, pleural fluid and any other body fluid containing blood (World Health Organization, 2003, p. 33-34). The risk of contracting Hepatitis B infection is about 30% (Gershon, Vlahov, Feiknor, Vesley, Johnson, Delclos & Murphy, 1995, p. 226). The mode of transmission of Hepatitis C infection is mainly through percutaneous injuries (World Health Organization, 2003, p. 34). The risk of contracting Hepatitis C is 6 to 10% (Gershon *et al.*, 1995, p. 226).

Human Immunodeficiency Virus (HIV) can be transmitted through used needles contaminated with HIV, infusions that are contaminated with HIV and by sexual contact (World Health Organization, 2003, p. 33). The risk of contracting HIV after a needle prick injury is less than 0.5% (Gershon *et al.*, 1995, p. 226). Although the risk of transmission in the above mentioned blood-borne infections is very small, the risk of nurses being infected is higher because of daily exposure in areas of high prevalence.

1.1.2 Universal Precautions versus Standard Precautions: In 1987, the Centre for Disease Control in U.S.A, implemented “universal precautions to prevent the health care worker (nurse) from parenteral, mucous membrane and non-intact skin exposures to blood-borne pathogens”; (Centre for Disease Control, 1988, p.377). ‘One of the main reasons that universal precautions must be used by all health care workers for all patients, is in the difficulty with HIV testing’. The Centre for disease Control states that, the time it takes for a new HIV infection to show in the blood is called the window period, and this period can be from four to six weeks or three months. During this period, the infection is not yet detectable and in some people, it does not display any physical symptoms; but the infection can still be transferred from one person to another.

St George’s Healthcare (2007, p.9) implemented a protocol regarding the universal precautions for the prevention of occupational exposure to blood borne viruses. This protocol categorized body fluids into high and low risk groups. The body fluids that are classified as high risk may contain HIV, Hepatitis B and Hepatitis C. The fluids that are classified as high risk are breast milk, pus, body tissues, bone marrow, blood, vaginal secretions and pleural fluid. According to the universal precautions, body fluids that are classified as low risk are unlikely to contain the above blood borne pathogens; for example, fluids like faeces, urine

and vomit, unless they do contain visible blood. After the universal precautions were implemented, a study was conducted to evaluate whether implementation was temporarily associated with a decrease in reported parenteral exposures to blood (Beekmann, Vlahov, Koziol, McShalley, Schmitt, & Henderson, 1994, p. 562). The findings of the study demonstrated that there is an association between the significant progressive decrease in percutaneous injuries and the implementation of universal precautions (Beekmann *et al.*, 1994, p. 562). Then, in 1996 the Centre for Disease Control implemented a new approach, the standard precautions. The standard precautions were implemented to reduce the risk of transmission of micro-organisms from any source of infection in the hospital (Centre for Disease Control, 1996, p. 25). These standard precautions can be applied to blood; all blood fluids, secretions and excretions, except sweat, regardless of whether it contains visible blood or not. According to Wilburn & Eijkemans (2004, p.451) health care workers are exposed to two million needle prick injuries per year and are thus at risk of being exposed to blood-borne infections.



In the three tertiary hospitals (Tygerberg Hospital, Groote Schuur Hospital and Red Cross Hospital) in the Western Cape Province, 733 needle prick injuries were reported during the year 2008 (Western Cape Provincial Government: Department of Health, 2008) . Tygerberg Hospital had 382 needle prick injuries, Groote Schuur Hospital had 319 and Red Cross Hospital had 32 needle prick injuries. These statistics do show that, some nurses do not adhere to the standard precautions. Therefore, the purpose of the study is to investigate the nurses' knowledge and compliance regarding standard precautions in Tygerberg Hospital in the Western Cape.

1.2 Problem Statement

When nurses are rendering nursing care, they are exposed to patient's blood, body fluids and used needles that are contaminated with Hepatitis B, Hepatitis C and HIV thus resulting in them being at risk of getting infected with these blood-borne diseases. Therefore, research (Wong *et al.*, 1991, p.1123- 1128; Bauer & Kenny, 1993, p.429-435; Beekmann *et al.*, 1994, p.562; Cutter & Jordan, 2004, p.442) has shown that knowledge and compliance regarding standard precautions among nurses are very important as it reduces the incidence of injury or infection. According to previous research (Gershon *et al.*, 1995, p.225-236; Nelsing & Nielsen, 1997, p.692-698; Henry, Campbell, & Maki, 1992; Chan *et al.*, 2002, p.157) some nurses do not adhere to the standard precautions and thus may place themselves and the patient's life in danger of being infected by blood-borne pathogens.

1.3 Purpose and Significance

The purpose of this study is to determine if nurses at Tygerberg Hospital comply with, and if they have adequate knowledge regarding standard precautions; and to establish the factors that could influence the compliance or non-compliance of standard precautions. A better understanding of how much nurses "know", and the factors that influence their compliance towards standard precautions or infection control, could improve the nurse's knowledge and compliance. This could be attained by implementing more regular training sessions regarding personal protective equipment, information sessions to improve their infection control in the wards and by implementing other measures that reduce exposure to injury and infection.

1.4 Research Question

What is the knowledge and compliance of nurses regarding standard precautions in a tertiary hospital?

1.5 Objectives

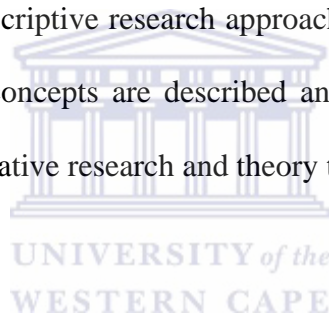
The objectives of this study are:

1. To determine the nurses' self reported knowledge with regards to standard precautions.
2. To determine the nurses' self reported compliance with standard precautions.
3. To determine the factors that could influence the compliance of nurses with standard precautions.

1.6 Research methodology

1.6.1 Research approach and design

A quantitative research and a descriptive research approach were used to conduct this study. "Through descriptive research, concepts are described and relationships are identified that provide a basis for further quantitative research and theory testing" (Grove, 2005, p.44).



1.6.2 Sampling technique

Stratified random sampling was used to select the different wards or units for the study so that the sample would have a representation of all the modules or divisions in Tygerberg Hospital. The population of the study included nurses working at Tygerberg Hospital in the following modules: theatre, surgery, pediatrics, emergency services, out patients departments, internal medicine, obstetrics and intensive care units. Tygerberg Hospital is a very large hospital with too many wards and units (1400 beds in total) therefore, these wards were clustered together and then the sample was selected from these modules. From each module, a random selection was done to select the different wards and all the nurses on duty working in the selected wards or theatres on that specific day were given a questionnaire.

1.6.3 Data collection tool

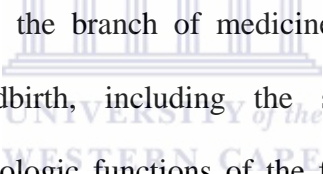
A self-reported questionnaire was used in the study. These questionnaires consist only of close-ended questions that were guided by the theoretical framework. The questionnaire focuses on whether nurses have adequate knowledge regarding standard precautions and if they comply with these standard precautions.

1.6.4 Data analysis

The data were analyzed through SPSS version 17 and it was presented in tables, graphs and charts. The cross-tabulation technique was used to determine the association between the knowledge and compliance variables.

1.7 Operational definitions

Obstetrics:



It is the branch of medicine concerned with pregnancy and childbirth, including the study of the physiologic and pathologic functions of the female reproductive tract and the care of the mother and fetus throughout pregnancy and immediate postpartum period (Anderson, Novak & Elliot, 2002, p.1208).

Blood-borne pathogens:

Pathogenic micro-organisms that are transmitted via human blood and cause disease in humans (Anderson, Novak & Elliot, 2002, p.217).

Cerebrospinal fluid:

The fluid that flows through and protects the four ventricles of the brain, the subarachnoid spaces and the spinal canal (Anderson, Novak & Elliot, 2002, p.325).

- Amniotic fluid:** A liquid produced by the fetal membranes and the fetus. It surrounds the fetus throughout pregnancy, protecting it from trauma and temperature variations providing freedom of fetal movements and helping to maintain the fetal oxygen supply (Anderson, Novak & Elliot, 2002, p.82).
- Pleural fluid:** This fluid is a serous fluid and its produce by the membrane between the visceral and parietal pleurae (The American Heritage Stedman's Medical Dictionary, 2004).
- Percutaneous:** The route of administration that involves piercing the skin or mucous membrane (Anderson, Novak & Elliot, 2002, p.1311).
- Universal precautions:** An approach to infection control designed to prevent transmission of blood borne diseases such as Human immunodeficiency virus, hepatitis B and hepatitis C (Anderson, Novak & Elliot, 2002, p.1776).
- Nurse:** A person educated and licensed in the practice of nursing; one who is concerned with diagnosis and treatment of human responses to actual or potential health problems (Anderson, Novak & Elliot, 2002, p.1200). Nurses in this study are professional nurse, enrolled nurse and auxiliary nurses.
- Standard precautions:** It is guidelines recommended by the Centers for Disease Control and Prevention (CDC) to reduce the risk of transmission of blood-borne and other pathogens from both recognized and unrecognized sources of infections in hospitals

(Anderson, Novak & Elliot, 2002, p.1625).

1.8 OUTLINE OF DISSERTATION

A brief outline of how the chapters were divided is as follows:

Chapter one:

This chapter is an introduction to the problem of the study and it indicates the research methodology that will be used in the study.

Chapter two:

This chapter provides the theoretical framework that will guide the study. It also provides a review of literature regarding the knowledge and compliance with standard precautions amongst nurses in different hospitals.

Chapter three:

This chapter includes the outline of the methodology of the study, the sampling technique, sample description and the data collection instrument.

Chapter four:

This chapter includes the outline of the data analysis. The SPSS version 17 was used for the data analysis. Descriptive and inferential data analysis was used to interpret results.

Chapter five:

In this chapter, all the main findings of the study are highlighted and explained.

CHAPTER TWO

Literature Review

2.1 INTRODUCTION

This chapter focuses on the literature review of the knowledge and the compliance with standard precautions amongst nurses in hospitals. This chapter also provides a review of literature on the factors that influence the compliance of nurses regarding standard precautions. Most of the literature that was found was done internationally or in Africa but very few investigations were done in South Africa regarding these above mentioned topics. The theoretical framework that was used in this study will also be discussed in this chapter.

2.2 The Theoretical Framework

The Health Belief Model is the theoretical framework that was used for the study. The Health Belief Model was first developed in the 1950's by the social psychologists Hochbaum, Rosenstock and Kegels in the United States Public Health Services (DiClemente & Peterson, 1994, p.5). According to Rosenstock, (1974, p. 8), changes of behaviour depend on the following five factors: perceived severity, perceived susceptibility, perceived benefits, perceived barriers and cues to action. Rosenstock (2005, p.6) states that, every person perceives the severity or seriousness of a health problem differently. According to Rosenstock (2005, p.6), the individual perceives the seriousness of a disease by thinking about the disease and also the problems that this disease can cause for him or her in the future; for example; death or disability for the individual permanently.

According to Rosenstock (2005, p.6), perceived susceptibility refers to the individual that is at risk of contracting a condition. Every individual differs in the acceptance of the condition. Some of the individuals deny they can contract any health problem and some of the

individuals feel that they are in real danger of contracting the condition (Rosenstock, 2005, p.6).

Rosenstock (2005, p.7), states that the direction of action that the individual will take is mostly influenced by the beliefs regarding the different alternatives. If the alternative is available and it can reduce the susceptibility to a disease or the severity of a disease, then the individual will perceive this alternative as a benefit (Rosenstock, 2005, p.7). When the alternative is perceived as a benefit, but at the same time it is inconvenient, expensive or difficult to use, then it has negative aspects which can influence the individual's health action (Rosenstock, 2005, p.7). "If the readiness to act is low while the potential negative aspects are seen as strong, they function as barriers to prevent action" (Rosenstock, 2005, p.7).

These five factors can determine what health related action the nurse (as applied in this study) is going to take. Davidhazir (1983, p.467), states that because nurses have much more contact with patients than any other health care worker, they are in position to influence health behaviour. The following studies provide examples of research studies where these five factors influence the nurses' health related behaviour.

2.3 Nurses' Knowledge of Standard Precautions.

This section of the literature review will focus on the knowledge of nurses with regards to standard precautions and the relationship between the knowledge and compliance amongst nurses.

A qualitative and quantitative study was conducted by Ferguson, Waitzkin, Beekman & Doebbeling (2004, p.729), to identify and assess the critical incidents that do not adhere to the standard precautions. A stratified random sample of community health care workers was used in this study. The findings showed that twenty two percent of the health care workers

believe that when you do not adhere to standard precautions would place the patient's life in danger. Then, fourteen percent of the participants feel that there is no need for standard precautions in some circumstances for example, one of the responses was, this person frequently recap needles because he or she was prick by a needle that was not recapped before discarding into the sharps box.

Fourteen percent of the responses said that sometimes they did not anticipate the potential for exposure to blood or body fluids, but then, it is too late to use precautions. Six percent of the participants forgot to use standard precautions and four percent of the respondents do not use any standard precautions because they believe that the patients do not pose a risk to them.

Ofili, Asuzu, & Okojie (2003, p.26), conducted a study in Central Hospital Nigeria, which aimed to determine the knowledge of and compliance with universal precautions among nurses. Results showed that, these nurses had a poor knowledge level of universal precautions with only 34.2% of the nurses having heard of universal precautions. There was also a poor observance of universal precautions amongst these nurses.

Mokabel et al. (1995, p.523), conducted a study in Tanta Fever Hospital to determine the relationship between the knowledge of nursing staff and their compliance with universal precautions for the prevention of hepatitis B infection. The data collection method for the study was the use of interview, questionnaires and observation checklists. The results showed that the nurses' knowledge and compliance was below the average in all of the items in the questionnaire. Furthermore, no relationship was found between levels of knowledge and levels of compliance. Findings showed that, nurses with less than five years of experience perceive blood-borne pathogens as serious and themselves as susceptible and therefore comply more with universal precautions.

These above mentioned literature illustrate that majority of the nurses in the studies have inadequate knowledge regarding the basic principles of standard precautions. Research (Ferguson, Waitzkin, Beekmann & Doebbeling 2004, p.729) shows that nurses think that they should recap needles before discarding it in order to prevent themselves from needle prick injury and this gives a clear indication that nurses have inadequate knowledge or they don't want to comply with the standard precautions and this is seen as a problem.

2.4 Perceived severity and susceptibility

The following studies demonstrates that when nurses perceived the seriousness and the susceptibility to blood borne infections, they would react by complying with standard precautions or some of the nurses would not render any nursing care to specific patients that are infected.

Moghbeli (2002, p 49-55) conducted a study, to determined if the various ethnic backgrounds of nurses influence their compliance with universal precautions. There were only sixty two participants and most of them were Caucasian females, between the ages of forty and forty-nine years. There were no significant differences found amongst the various ethnic groups in compliance with infection control practices. The findings showed that, if nurses perceive the severity of blood-borne infections they would comply with the universal precautions. For example, the compliance scores were higher when the patients' HIV status was known to be positive.

Another study was done by Preston, Forti & Kassab (2002, p.34), to examine the relationship between profiles of registered nurses in rural areas, their level of compliance and the usage of personal protective equipment. Data were collected from three hundred ninety seven participants in nine rural counties in New York. Cluster analysis was used to group

these profiles according to their usage of personal protective equipment for patients with HIV status. The findings of the study showed that, when nurses know that the patient is HIV negative or the status is unknown then there is a lack of compliance; but as soon as they know the patient is HIV positive the nurses would increase their compliance. Both of these studies demonstrate that nurses do not comply with standard precautions. When the patient is HIV positive then they protect themselves by using standard precautions but when the status is unknown the nurses “assume” that the patients is HIV negative and then do not use standard precautions and place them at great risk of getting infected with any blood- borne infections.

Kagan, Ovadia, & Kaneti, (2009, p.13-19), conducted a study in a medical centre in Israel. The purpose of study was to examine the relationship between the nurses’ knowledge of blood-borne pathogens, their professional behaviour regarding hand washing, compliance of standard precautions and the avoidance of the therapeutic contact of with blood-borne infections in patients. The findings of study show that the nurses had a higher level of knowledge on HIV than Hepatitis B and Hepatitis C. Only 54, 4% of the nurses stated that all patients should be treated as blood-borne pathogens carriers. More than three-quarter (77. 3%) of the sample reported that they avoid having contact with patients that are infected with any blood-borne infections. A weak relationship was found between the nurses’ knowledge regarding blood-borne pathogens and the nurses avoiding patient infected with blood-borne pathogens.

2.5 Perceived benefits and barriers

In the following studies, there are benefits and barriers that influence the compliance of standard precautions amongst nurses in the hospitals. According to these benefits and barriers or factors that the nurses perceive, they may take an action.

A study was conducted by Mc Govern, Vesley, Kochevar, Gershon, Rhame & Anderson (2000, p.149), to determine the factors that are associated with the compliance of universal precautions amongst the health care workers which are at risk of blood borne exposure. The study was held at a large teaching hospital in Minnesota and they made use of convenience sampling. The findings of the study revealed that fifty percent (50%) of the respondents were nurses and the average respondents had been in their present jobs for seven years. The findings showed that there are specific factors associated with compliance of universal precautions amongst health care workers; the longer the duration of working at the current job, then the knowledge regarding HIV transmission and the attitudes towards preventative behaviour increases.

Another factor that can be associated with the compliance of personal protective equipment is the training in the use of personal protective equipment to health care workers. According to the findings, the health care workers that received training about personal protective equipment were likely to be more compliant to standard precautions than the health workers that received no training.

Williams, Campbell, Henry & Collier (1994, p.138) conducted a study to identify the factors that influence the health care worker compliance with universal precautions. The findings of the study showed that health care workers were likely to wash their hands after they have been in contact with blood and body fluids and to wear gloves if contact of blood would occur. According to the health care workers, the most common factors that could influence the compliance of standard precautions is time consuming and when they look at the patient they perceive the patient as not infected. The findings of this study and the study done by Mc Govern et.al (2000, p.149), indicates that if the health care workers have more training experience, they are likely to use gloves and do not recap needles.

In 2005, Kermode, Jolley, Langkham, Thomas, Holmes, & Gifford conducted a study in seven North Indian Health care settings. The researchers wanted to describe health care workers' knowledge and understanding of universal precautions and to identify the predictors of compliance. The majority of the respondents were female nurses. The health care workers had a good level of knowledge and a lack of compliance regarding universal precautions. The findings of the study showed that the health care workers working for a long period of time are more compliant and have higher level of knowledge regarding universal precautions. The results showed that 75% of the health care workers indicated that, it is not possible to wear protective clothing in an emergency situation, 56 % of the respondents feel that they are too busy to protect themselves when they are in contact with patients with blood, 46% of the respondents feel very uncomfortable wearing personal protective equipment, 41% of the respondents feel that personal protective equipment influences their work performance and 25 % of the respondents were not adequately trained in using the personal protective equipment so they don't know how to use it. These findings illustrate that the nurses who receive training regarding standard precautions adhere to standard precautions because they are taught when to use standard precautions and which personal protective equipment to use.

Ofil, Asuzu & Okojie (2003, p.333), conducted a study in Central hospital, Nigeria. The aim of the study was to find out the predisposing factors of the blood-related work accidents amongst the health care workers. The results of the study showed that, from the 242 healthcare workers that participated, 155 of the group were nurses. The results also showed that, the main four factors responsible for accidents among health care workers were the non-availability of protective measures, such as emergency procedures or major surgical procedures, lack of time and inappropriate equipment.

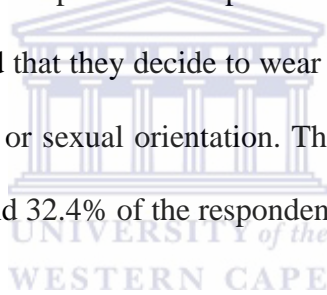
An investigation was done by Osborne in 2003 to determine the compliance rate of standard precautions and the factors that influence compliance amongst nurses working in theatre in Australia. According to the findings, the barriers that influence the compliance were; insufficient time, nurse perceive that the patient is not infected, personal protective equipment interfering with nursing care and the lack of personal protective equipment. The findings of the study demonstrate that, these barriers or factors have major influence on the compliance of standard precautions.

A study was done by De Joy, Murphy & Gershon (1995, p. 43) to determine the influence of employee, job and organizational factors on the adherence to universal precautions among nurses. The research was done in a medical centre in the United States and 451 nurses participated in the study. The results of the study have revealed that, the best predictor for the preventative action is knowledge regarding universal precautions. The study showed that, nurses that have adequate knowledge about universal precautions are the nurses which comply more with the universal precautions to prevent occupational exposures of blood borne infections. According to the results, one of the factors that could influence the compliance of universal precautions is the non availability of personal protective equipment; because, a lack of adequate personal protective equipment can cause occupational accidents. The findings of the study indicated that, nurses feel that universal precautions are interfering with their basic care and with the practitioner-patient relationship.

Ganczak & Szych (2007, p.346) also conducted a study to evaluate the self-reported compliance with personal protective equipment and the factors associated with the compliance and non-compliance amongst surgical nurses from 18 selected hospitals in Poland. There were 601 surgical nurses selected to complete the questionnaire. The results of the study showed that 37% of the nurses stated that one of the main reasons for non-

compliance is due to non availability of personal protective equipment and 32 % of the nurses feel that it interferes with providing good basic nursing care.

In 2004, Cutter and Jordan did some research to determine strategies to minimize professionals' risks of acquiring blood borne infections during exposure-prone procedure and find out the reasons for noncompliance of universal precautions. The data collection instrument was a self-administered questionnaire distributed through internet mail to the surgeons, theatre nurses, midwives in National Health Service trust in the UK. The findings of the study revealed that there was 72.5% response rate and only 1.5% of the respondents use universal precautions for all the patients irrespective of whether their status is known. Some of the respondents admitted that they decide to wear protective equipment according to the patient's nationality, lifestyle or sexual orientation. The findings also revealed that there was under-reporting of injuries and 32.4% of the respondents did not report any injuries.



In Botswana, Chelenyana and Endacott (2006, p.148-154), conducted a study to investigate the practices and perceptions of the nurses working in the emergency departments related to infection control and HIV/Aids pandemic. This study was both qualitative and quantitative. According to the quantitative data analysis, the results show that the majority of the respondents indicated that they comply with infection control and universal precautions but the qualitative results show that, although the nurses indicated that they comply with universal precautions, there were still restrictions with compliance. The nurses identify that there were inadequate resources to provide quality personal protective equipment. They also identified that there was shortage of staff and absence of in-service education programmes.

According to Vardas (2002, p. 9), health care workers in South Africa are at an increased risk of occupational exposure to blood borne viruses. The findings revealed that the majority of the health care workers were not immune to hepatitis B virus and only 21.2% of the participants having a history of past immunization against Hepatitis B. If the participants had previous hepatitis B vaccinations it was six years earlier.

2.6 Summary

According to the above literature review, research shows that most of the health care workers only apply standard precautions to the patients when they know that the patient is HIV positive then the nurses realize the seriousness or the susceptibility; but when the patient's status is unknown, they rarely use these standard precautions. Therefore, when the nurses see that these standard precautions can be a benefit, in order to protect themselves, when the patient is HIV positive, then the nurse would make use of standard precautions. The above literature also shows that, there are many perceived barriers that influence the nurses not to make use of standard precautions; for example, the lack of sufficient protective equipment available in the hospital and nurses not receiving any training regarding infection control.

CHAPTER THREE

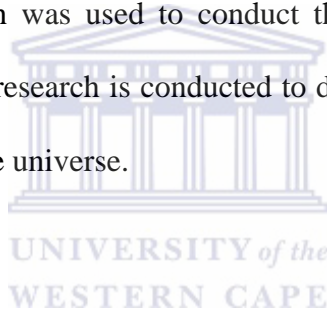
Research Methodology

3.1. Introduction.

In this chapter, all the methods that were used during this study will be explained. These are the following topics that will be addressed in this chapter; research approach, research design, target population, sampling technique, data collection instrument, reliability, validity, ethical considerations and data collection.

3.2 Research Approach

A quantitative research approach was used to conduct this study. According to Burns & Grove (2005, p.24), quantitative research is conducted to describe and examine relationships and to make generalizations to the universe.



3.3 Research Design.

A non-experimental research design was used to conduct the study. The researcher made use of a descriptive cross-sectional survey in the form of a self administered questionnaire to collect the data for the study.

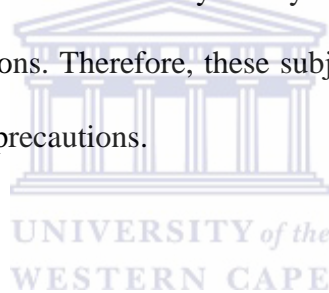
3.4 The Population

There are a total of 28 362 nurses employed in the Western Cape. The population that will be used in the study is all nurses employed in the tertiary hospitals in the Western Cape. These nurses consist of professional nurses, enrolled nurses and auxiliary nurses, excluding student nurses.

3.4.1 Target Population

The nurses working at Tygerberg Hospital were the target population for the study. The reason being Tygerberg Hospital had the highest number of needle prick injuries amongst the three tertiary hospitals in the Western Cape in the year 2008; therefore the nurses at Tygerberg Hospital were chosen as the target population. These nurses consist of enrolled, auxiliary and professional nurses.

The criteria for selecting subjects were; subjects had to be registered or enrolled at the Nursing Council and they either must work permanently or for a nursing agency at Tygerberg Hospital. These subjects could provide the study with first-hand information because they are providing basic nursing care to patients on a day to day basis and thus, are at risk of being infected with blood borne infections. Therefore, these subjects could give a good self report on the compliance with standard precautions.



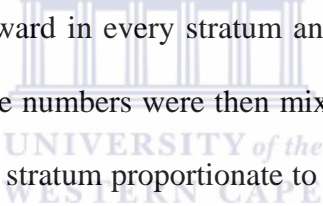
3.5 Sample Description

Engel & Schutt (2005, p.103), define sample as the subset of a population that is used to study the population as a whole.

3.5.1 Sampling Technique.

Stratified random sampling was used to select the sample for this study. De Vos, Strydom, Fouche & Delport (2005, p.200), stated that, as in Chadwick, Bahr & Albrecht (1984) this kind of sampling was used to ensure that there was sufficient representation of the nurses working in the different modules in the sample. Tygerberg Hospital is a very large institution;

this is also a reason why all units or wards from the different departments were clustered together. There will be eight strata, for example outpatients, surgical wards, emergency wards, intensive care units, pediatrics, theatres, obstetrics and medical wards. Each stratum would consist out of 8-10 wards with about +/- 10 nurses (professional nurses, enrolled nurses and auxiliary nurses) in one ward. I used stratified random sampling to select the different wards or units from each module so that the sample has representation of each module. The intention was to use stratified random sampling to select participants from the various wards that were randomly selected from modules but due to logistical issues, this was not possible at the level of individual participants hence convenient sampling had to be used in order to achieve feasible completion of the study. The limitation of this aspect was considered.



A number was assigned to each ward in every stratum and then placed in a hat in order to select the wards for the study. The numbers were then mixed thoroughly and then randomly selected certain wards out of each stratum proportionate to the stratum. From each module or stratum, there was a random selection of three wards or units. All the nurses working in the selected wards that were on duty the specific day of the study was given a questionnaire by the Assistant Director of the specific module. The sampling excluded all student nurses.

3.5.2 Sample Size. According to Nieswiadomy (1998, p181), to obtain the required sample from a population of 1000 it is necessary to have a sample of 100 or use 10 percent from the total population. The total population of nurses is 1523 at Tygerberg Hospital, so, I took 10 percent of the total population which is 152. The sample for the study will be 152 nurses.

3.5.3 SAMPLE FRAME

DIFFERENT MODULES	TARGET POPULATION	NUMBER OF PARTICIPANTS USED FROM THE TARGET POPULATION	PERCENTAGE
Theatre	183	18	10%
Surgery	135	14	10%
Pediatrics	289	29	10%
Emergency services	229	23	10%
Internal medicine	179	18	10%
Outpatients	74	7	10%
Obstetrics	185	18	10%
Intensive Care Unit	249	25	10%
Total	1523	152	10%



The above given sample frame is the total number of nurses (professional, enrolled, auxiliary) and the number of participants that were used in each module for the sample at Tygerberg Hospital. From each module, three wards were randomly selected and then all the nurses on duty in these selected wards were handed a questionnaire by the Assistant Director.

3.6 DATA COLLECTION INSTRUMENT

A self-reported questionnaire written in simple English was used to collect the data for this study. The Assistant Director of each module administered the questionnaire to the nurses working in the selected wards or units and then they collected it again from the subjects. Then I would collect the questionnaires from the different Assistant Directors.

The health belief model was used as a guideline to structure questionnaire. This instrument consists of four sections. The first section consists of demographic questions and the second section is to determine the knowledge levels of nurses regarding standard precautions. The third section of the questionnaire was to determine if nurses perceive the risk of blood borne infections and the fourth section consist of the factors that could benefit or be a barrier to the use of standard precautions. The purpose of section four was to determine the barriers that influence the noncompliance or the compliance of standard precautions, in order to remove these barriers, so that nurses can protect themselves and the patient by being compliant to standard precautions.

3.7 RELIABILITY AND VALIDITY

3.7.1 RELIABILITY.

According to de Vos, Strydom, Fouche & Delport (2005, p.162, 163), the reliability of an instrument is the stability or consistency of the instrument and this means when the same variables are measured under the same circumstances, the same measurements are gained.

There were different strategies used to estimate the reliability of the study. The first strategy that was used is the structuring of questions to re-test previous questions in the questionnaire, in order to measure whether the nurses have answered the questions consistently. Two or more questions were used to measure each aspect of the variable in the questionnaire. The reliability of the study can also be estimated by the calculation of Cronbachs alpha (Brown, 2002, p.17). According to Santos (1999) Cronbachs alpha estimates the internal consistency of a correlation of items in a questionnaire to determine the reliability. The third strategy was, using a pilot study.

3.7.2 PILOT STUDY.

De Vos, Strydom, Fouche & Delpont (2005, p.206), stated that, Bless and Higson-Smith (2000, p.155), define a pilot study as a small study conducted prior to a larger piece of research to determine whether the instrument, sample technique and data analysis are appropriate for the study. The pilot study was done to improve the reliability of the instrument. The questionnaire was administered to 10% of the sample size (not the participants of the study). These participants were asked to indicate if they have any difficulty in understanding the questionnaire's instructions or the meaning of the words in the questionnaire. The participants indicated that they had no difficulty in answering the questions or understanding the instructions and there were no additional changes made on the instrument.



3.7.3 VALIDITY.

De Vos, Strydom, Fouche & Delpont (2005, p.160), stated that Babbie in 2004 referred validity to be the extent to which an instrument measures what it is supposed to measure. The instrument according to De Vos, Strydom, Fouche & Delpont (2005, p.160) actually measures the concept in the question and that the concept is measured accurately. There are many types of validities use to measure the instrument for example content, face, criterion and construct validity.

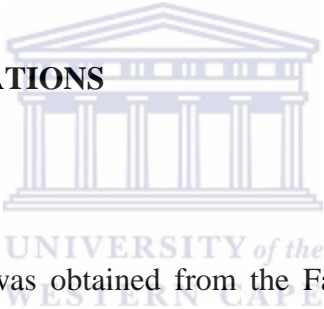
3.7.2.1 CONTENT VALIDITY

According to De Vos, Strydom, Fouche & Delpont (2005, p.160) content validity is

concerned with the representativeness or sampling adequacy of the content (eg. topics or items) of an instrument. Content validity of the instrument was established through the construction of the instrument for example, the literature search that was done on the topic and how well the questions in the questionnaire represent the variables. Then the instrument was given to experts in that area (occupational health nurses, and occupational health and safety managers) to evaluate the instrument and compare their findings, but no additional changes were made to the instruments so then face validity was confirmed. Face validity and criterion validity were enhanced by the review of literature and previously used research tools in this area, in order to provide definitions of the items in the questionnaire.

3.8 ETHICAL CONSIDERATIONS

3.8.1 PERMISSION



Ethical clearance for the study was obtained from the Faculty of Community and Health Sciences, Higher Degrees Committee. Permission to conduct the study was also obtained from the Director of Tygerberg Hospital and the Director of Nursing. The Director of Nursing at Tygerberg Hospital did not grant permission to distribute the questionnaire; she felt that the Assistant Director of each module must distribute it to the selected wards at the same time. The Assistant Director of each module or stratum was verbally informed that the study will be taking place and permission was obtained to access the nurses.

3.8.2 INFORMED CONSENT

An information sheet was given to all the participants in the study to inform them of the

reasons for conducting this study, as well as the reasons why they were selected (see Appendix C). A consent form was given to each participant to indicate their voluntary participation in the study, (see Appendix D).

3.8.3 RESPECT FOR HUMAN DIGNITY

Participants were informed verbally and were also given an information sheet regarding their right to choose whether or not to participate in the study. They also had the right to refuse to give any information or to withdraw from the study process at any time. The study had no further effect on them. There were no rewards or payments for participants due to lack of resources and money.



3.8.4 ANONYMITY AND CONFIDENTIALITY

Participants were assured that all the information gained from the study was to be treated as confidential. Participants were also not expected to write their names on the questionnaires that were distributed.

3.8.5 PROTECTION FROM HARM

Participants were not forced against their will to partake in the study and no harmful effects were expected from completing the questionnaire.

3.9 DATA COLLECTION

The data collection took place during November 2009. Three wards out of each stratum or module were randomly selected and all the nurses on duty in the selected wards were handed a questionnaire. Then, the participants had an approximately fifteen to twenty minutes to complete the questionnaires.

3.10 DATA ORGANIZATION

The data that was collected was organized by the use of statistical Package SPSS version 17. Participant responses were then categorized coded and labeled to facilitate easy access in the SPSS programme. The data is analyzed by the use of descriptive statistics where frequency distributions were used and it was presented in bar graphs, pie charts and tables. Cross tabulations were done of the different variables to determine any relationship and chi-square was used as the test for significance. According to de Vos, Delport, Fouche & Strydom (2005, p.242), the test for significance was implemented by the use of the level of significance. The level of significance that was used for this study was 0.05.

3.11 SUMMARY

This chapter gave a full description of the methodology, data collection and the data analysis that was going to be used in the study. In the next chapter the findings of the data analysis will be presented in frequency tables, charts and discussions.

CHAPTER 4

DATA ANALYSIS

4.1. INTRODUCTION

In this chapter all the findings of the study will be displayed and an outline given of the data analysis that was used. The results of the study provide feedback on how much knowledge the nurses have regarding standard precautions and also if they comply with these precautions. These findings also provide the researcher the factors that could influence the nurse's compliance with regards to standard precautions. The findings of the study were analyzed by SPSS version 17 with the use of descriptive and inferential statistics.

4.2 REALISATION OF DATA

4.2.1. Final sample size

The sample of this study includes a representation of each module or division (pediatrics, theatre, surgery, obstetrics, internal medicine, emergency services, out patients and intensive care units) at the Tygerberg Hospital. Each module consists of eight to ten wards or units; for example, the intensive care module consists of units A1, A2, A4, A5, A6, A7 and A9.

There were hundred and forty three nurses who participated in the study. In theatre, 18 nurses out of approximately 183 nurses, in surgery, 14 nurses out of approximately 135 nurses, in pediatrics, only 20 nurses out of 289, in emergency services 23 out of approximately 229 nurses, in internal medicine, 18 nurses out of 179 nurses, in outpatients clinics, 7 nurses out of 71 nurses, in obstetrics, 18 nurses out of 185 nurses and in intensive care units, 25 nurses out of 249 nurses(due to daily personnel changes, the totals per ward

may vary a little from day to day). The above mentioned numbers per module were the official total of subjects that partake in the study, but minimal fluctuations occur. This is approximately 10% of the total of nurses from each module in order to support fair representation from all wards in the hospital.

Figure 4.2.1: PRESENTATION OF FINAL SAMPLE SIZE

DIFFERENT MODULES	TARGET POPULATION	NUMBER PARTICIPANTS USED FROM THE TARGET POPULATION	OF PERCENTAGE
Theatre	183	18	10%
Surgery	135	14	10%
Pediatrics	289	20	7%
Emergency services	229	23	10%
Internal medicine	179	18	10%
Outpatients	74	7	10%
Obstetrics	185	18	10%
Intensive Care Unit	249	25	10%
TOTAL	1523	143	9%

4.3 DATA ANALYSIS

4.3.1 Summary Analysis

All the data collected were entered twice into SPSS 17 to check if the data is entered correctly. There were 152 questionnaires distributed but 143 questionnaires were returned and it was a response rate of 94%. There were three cases, where the participants completed the demographic section and then refused to complete the rest of the questionnaire, because they didn't have time. The other six questionnaires were not returned to the researcher. These above mentioned nine questionnaires were not used for study because of incomplete questionnaires.

There were 143 questionnaires returned to the researcher, but some of these questionnaires had missing responses. So table 4.3.1.1 consists of all the items in the questionnaire that had missing responses.

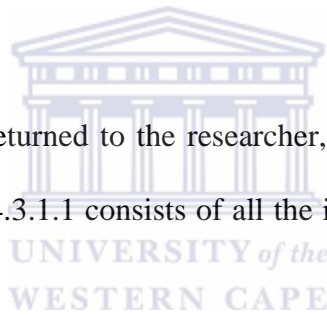


Table 4.3.1.1.: Frequency (%) of all the items in the questionnaire with missing values

SECTIONS/ITEMS	Categories	Frequency (%)	Missing Values
Section 1: Demographic section			
Gender	-Male -Female	6 (4.2) 137(95.8)	0
Age ranges	-Between 18-25 -Between 26-30 -Between 31-35 -Between 36-40 -Above 40	10 (6.9) 14 (9.8) 21 (14.7) 30 (21) 68 (47.6)	0
Highest qualifications	-Nursing diploma -Bachelors degree -Masters Degree	69 (55.2) 7 (5.6) 0	18

	-Any other	49 (39.2)	
Employment status	-Enrolled nurse	40 (28.2)	1
	-Auxiliary nurse	45 (31.7)	
	-Professional nurse	57 (40.1)	
Working experience	-Between 0-5 years	36 (25.2)	0
	-Between 6-10 years	10 (7)	
	-Above 11 years	97 (67.8)	
Whom for are you working today	-Nursing agency	1 (0.7)	3
	-Tygerberg Hospital	139 (99.3)	
Section 2: Knowledge			
Discarding of used needles in sharps box	-True	132 (93.6)	2
	-False	9 (6.4)	
Standard precautions should be applied to vaginal discharge	-True	121(89)	7
	-False	15 (11)	
Wearing of masks and goggles	-True	20 (14.2)	2
	-False	121 (85.8)	
Standard precautions used for HIV and Hepatitis B patients	-True	25 (18.1)	5
	-False	113 (81.9)	
Standard precautions applied to all patients	-True	48 (34.5)	4
	-False	91 (65.5)	
Glove used in all caring activities when the patient is HIV positive	-True	90 (63.4)	1
	-False	52 (36.6)	
Should used needles be discarded in a puncture- resistant container	-True	43 (31.2)	5
	-False	95 (68.8)	
Contact with urine should standard precautions be used	-True	127(92)	5
	-False	11 (8)	
Should nurses be immunized?	-Yes	143 (100)	0
	-No		
Which immunization should be used	-Hepatitis E	0	1
	-Hepatitis D	0	
	-Hepatitis B	91 (64.1)	
	-All of the above	51 (35.9)	
Hepatitis B virus can only live for twenty four hours outside the body before it	-True	41 (32.5)	17
	-False	85 (67.5)	

becomes inactive.			
Section 3: Nurses compliance regarding standard precautions			
During resuscitation of a patient, I would use my mouth to save a patient's life.	-Yes -No	30 (21) 113 (79)	0
Do you think it is necessary to use gloves when there is blood or body fluids	-Yes -No	142 (99.3) 1 (0.7)	0
When providing nursing care or doing any procedure on Mr. Johnson and other patients is it necessary to wash your hands every time?	-Always -Sometimes -Only if dirty	143 (100) 0 0	0
Do you think it is necessary to wash your hands if you had gloves on?	-Yes -No	127 (88.8) 16 (11.2)	0
After injecting Mr. Johnson do you think needles must be recapped or removed by hand to prevent any injuries?	-Recap needles -Remove the needles by the hand -None of the above -Recap and remove needles by hand	15 (10.9) 18 (13) 95 (68.8) 10 (7.3)	5
If Mr. Johnson is HIV negative is it necessary to wear goggles to prevent when blood splashes?	-Yes -No	131 (91.6) 12 (8.4)	0
Is there a difference in the N95 and the surgical masks in terms of safety and how long you can use it?	-Yes -No	117 (89.3) 14 (10.7)	12
There is a shortage in needles in the hospital; can you use the needle twice if all the patients including Mr. Johnson were tested HIV negative?	-Yes -No	2 (1.4) 141 (98.6)	0
If Mr. Johnson is tested HIV negative and Hepatitis B positive do you think it is necessary to put the linen in a separate bag?	-Yes -No	103 (72.5) 39 (27.5)	1
When working with body fluids without visible blood do you work with gloves?	-Never -Often -Always	1 (0.7) 22 (15.6) 118 (83.7)	2
Section 4: Factors influencing compliance			
Do you think the area where you work has			

enough protective equipment for example gloves, masks and gowns?	-Yes	85 (59.9)	1
	-No	57 (40.1)	
If you have insufficient protective equipment in your work area do you think that it could influence applying standard precautions?	-Yes	132 (93)	1
	-No	10 (7)	
Do you receive training how to wear these protective equipment?	-Yes	92 (65.2)	2
	-No	49 (34.8)	
Do you think it is necessary to receive training regarding standard precautions or infection control?	-Yes	137 (96.5)	1
	-No	5 (3.5)	
If yes, how many training sessions did you receive in this year?	-Less than two	27 (19.3)	3
	-More than two	45 (32.1)	
	-None	68 (48.6)	
Do you think when you are wearing gloves it interferes when rendering nursing care?	-Yes	36 (25.9)	4
	-No	103 (74.1)	

The researcher used this questionnaire to investigate how much nurses know and determine if nurses comply with these standard precautions. The questionnaire includes items that investigate factors that could influence the compliance and non compliance of standard precautions. The dataset consists of 35 items and 143 cases. Table 4.3.1.1 shows that, not all of the 143 respondents have filled in all the items in the questionnaire. Some of the respondents just left the items blank.

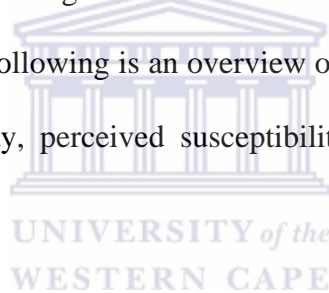
Descriptive and inferential analyses were used to analyse the data. The descriptive analyses consisted of frequency distributions presented in frequency tables, bar charts and pie charts. Cross tabulations were done to determine if there were any relationships between the variables and chi-square test was done to determine if there is any real statistically significant relationship between the variables (De Vos, Strydom, Fouche & Delpont ,2005, p.242-243).

The questionnaire consists of sections, and each section consists out of seven to ten items.

According to the statistical program it requires numerical value to calculate the statistics. Then the researcher developed a code sheet to explain the meaning of the value; for example, the answer yes equals one and the answer no equals two. When the questionnaire was analysed all the numerical values were added up in each section, then the researcher could determine if the nurses were compliant or non compliant with standard precautions by looking at these scores and statistics.

4.3.2 PRESENTATION OF THE INSTRUMENT

The questionnaire consists of four sections and it is applicable to all nurses in order to measure the nurses' knowledge and compliance with regards to standard precautions. The questionnaire was structured according to the Health Belief Model (Rosenstock, 2005), and also to meet the objectives. The following is an overview of how these sections corresponded to the factors (perceived severity, perceived susceptibility and perceived barriers) of the model.



SECTION 1: Demographics

This section consists of demographic questions, and these demographic questions provide the researcher a description of the sample. In this section, the researcher examined the following items; age group, gender, highest qualifications, employment status, and working experience as a nurse and for whom the nurse is working on the relevant day. When the data had been analyzed, the researcher had a better understanding how many of the respondents females or males were. It can also provide the researcher the working experience of each nurse.

SECTION 2: Knowledge

This section concentrates on the nurses' knowledge in the different modules with regards to standard precautions. In this section nurses are "tested" on the basic principles of standard precautions; for example, in which cases to use gloves, masks, aprons and goggles. They are also "tested" with regards to situations in which standard precautions could be used and also on the importance of immunization. This section provides the researcher with data on how much the nurses know about discarding of needles, when to use personal protective equipment and immunization.

SECTION 3: Perceived severity of threat to health

This section concentrates on the nurse's compliance with standard precautions in the wards and units. A health action depends on the person's perception of the severity of the threat according to Rosenstock (1980). It is assumed that, nurses who are in need for standard precautions will be compliant to avoid infection risks.

SECTION 4: Perceived susceptibility and perceived barriers to use of standard precautions.

This section concentrates on the factors that influence the nurses' attitude (either positive or negative) towards the use of standard precautions. According to Rosenstock (1980), in some cases nurses decide only to comply with standard precautions if it is a benefit to the nurse. In other situations nurses are curbed to comply with standard precautions because there are barriers or factors that influence the compliance; for example, shortage of personal and protective equipment. These benefits and barriers influence the nurse's compliance with regards to standard precautions.

4.3.3 PRESENTATION OF RESULTS

SECTION 1: Demographics

The first section of the instrument focuses on gender, age, highest qualification, working experience and employment status, to provide a detailed description of the demographic information of the sample. These results were presented in a frequency table, bar charts and pie charts.

Table 4.3.3.1: Demographic variables

DEMOGRAPHIC VARIABLES	VALUES	FREQUENCY	PERCENTAGES
Age ranges	1. Between 18-25	10	6.9
	2. Between 26-30	14	9.8
	3. Between 31-35	21	14.7
	4. Between 36-40	30	21.0
	5. Above 40 years	68	47.6
Highest qualification	1. Nursing diploma	69	55.2
	2. Bachelors Degree	7	5.6
	3. Masters Degree	0	0
	4. Any other	49	39.2
Employment Status	1. Enrolled Nurse	40	28.2
	2. Auxiliary Nurse	45	31.7
	3. Professional Nurse	57	40.1
Working experience	1. 0-5 years	36	25.2
	2. 6-10 years	10	7.0
	3. 11 and Above	97	67.8
Whom working today	1. Nursing Agency	1	0.7
	2. Tygerberg Hospital	139	99.3

In table 4.3.3.1 and figure 4.3.3.3 the results reveal that, 96% (137) of the respondents that completed the questionnaires were females and 99.3% (139) of the respondents in the sample were working permanently for the Tygerberg hospital but there was only one nurse in the sample that was working for a nursing agency at Tygerberg Hospital. The majority, 47.6% (68) of the nurses in the sample was older than 40 years, and 67.8% (97) of the nurses in the sample have been working as a nurse for more than 11 years. The results also show that 55.2% (69) of the participants in the sample have a nursing diploma but 5.6% (7) of the respondents had attended a university and obtained a bachelors degree and none of the nurses in the sample has a Masters degree.

The majority of the respondents in the sample were professional nurses, 40.1% (57), then 31.7% (45) were auxiliary nurses and 28.2% (40) of the respondents were enrolled nurses. This result demonstrates that, 60% of the nurses in the sample were in the non professional sector, and 40% were in the professional sector.

Figure 4.3.3.2 Number of respondents in each module (in frequency)

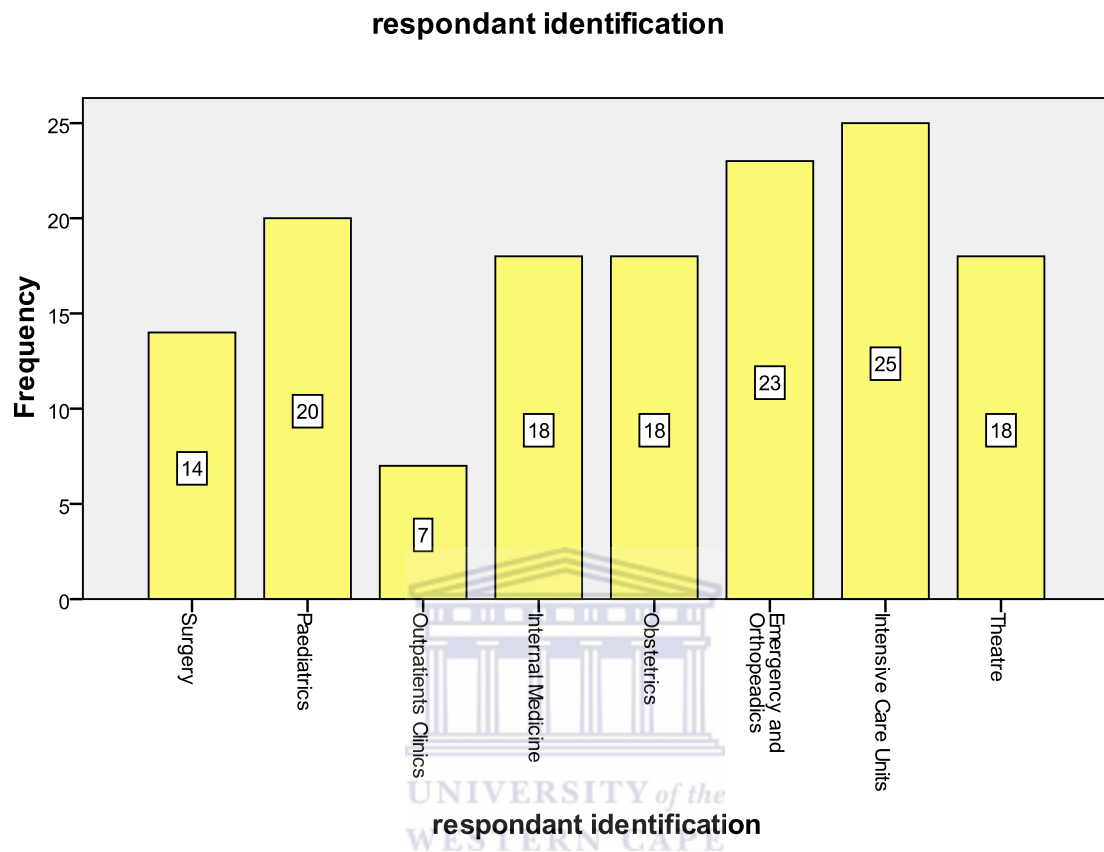
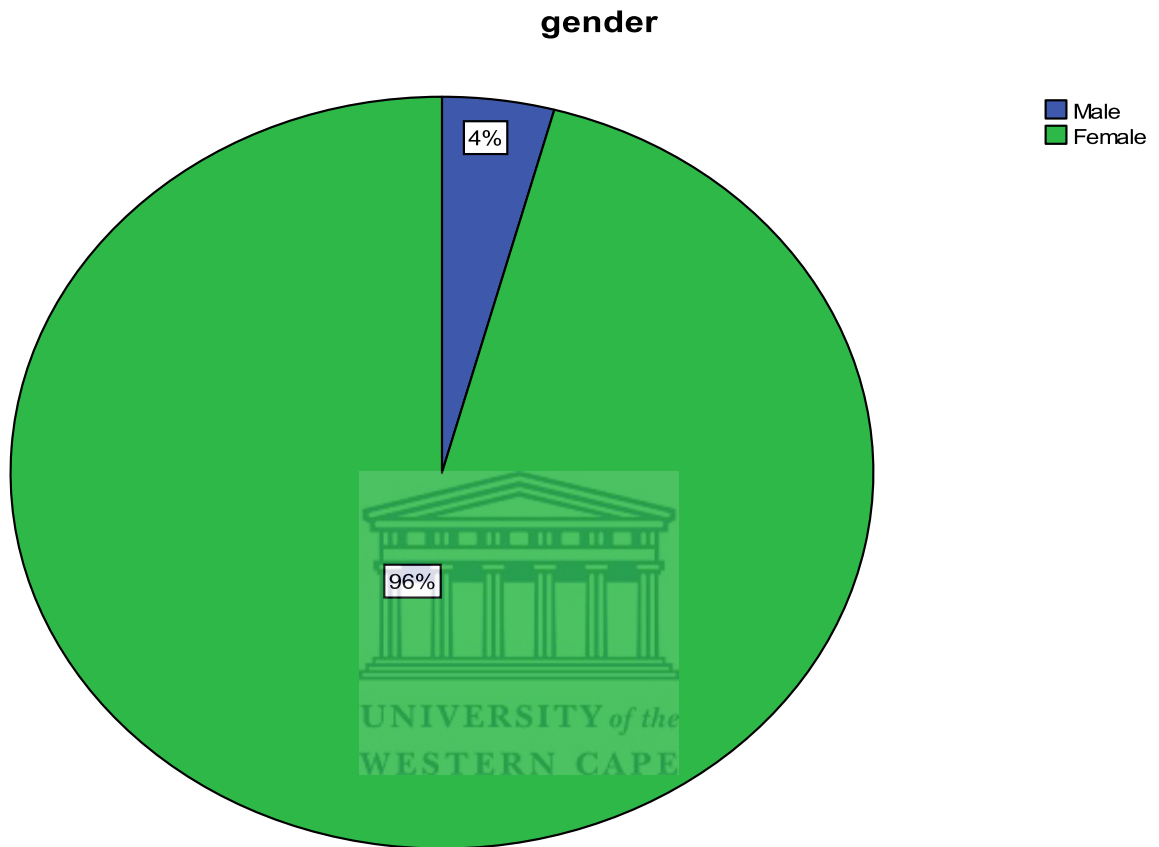


Figure 4.3.3.2 highlights how many respondents participated in each module at Tertiary Hospital. There were only twenty respondents in the paediatrics module and nine of the respondents did not complete the questionnaires. In the other modules, all the selected respondents completed their questionnaires.

Figure 4.3.3.3 Gender distribution of all the respondents (in percentage)



According to the data analysis, the female gender was mostly represented in the sample. This is a true reflection of the total target population in Tygerberg Hospital, where the majority of the nurses are females as nursing was previously a female dominated profession.

Figure 4.3.3.4: Age groups distributions amongst the respondents (in frequency)

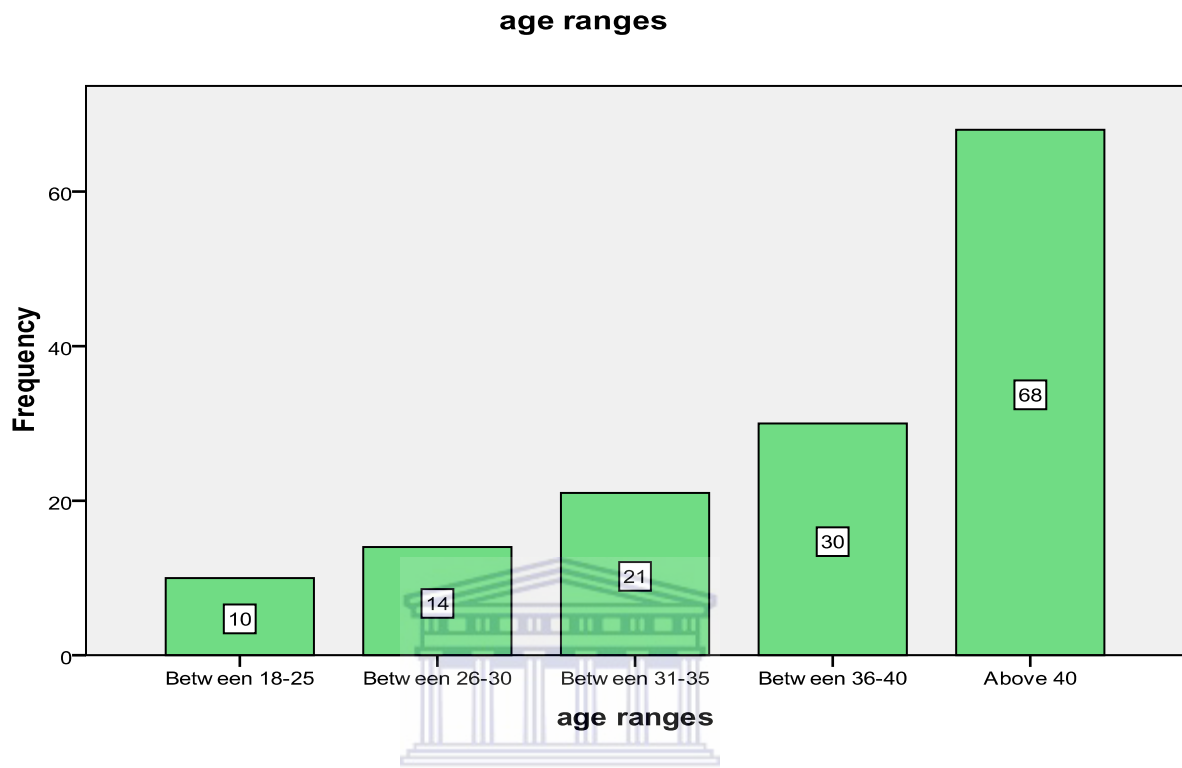


Figure 4.3.3.4 highlights that 6.9% (10) of the respondents were between the age range of 18-25 years and these nurses would not have many years of clinical experience, because they are recently qualified. This bar chart also illustrates that 21% (30) of the respondents were between the age of 36-40 years and 47.6% (68) of the respondents were above the age of 40 years old.

According to Naing, Nordin & Musa (2001, p. 639-640), younger nurses with less working experience, have a better knowledge than older nurses, regarding universal precautions.

Figure 4.3.3.5: Working experience of the nurses (in percentage)

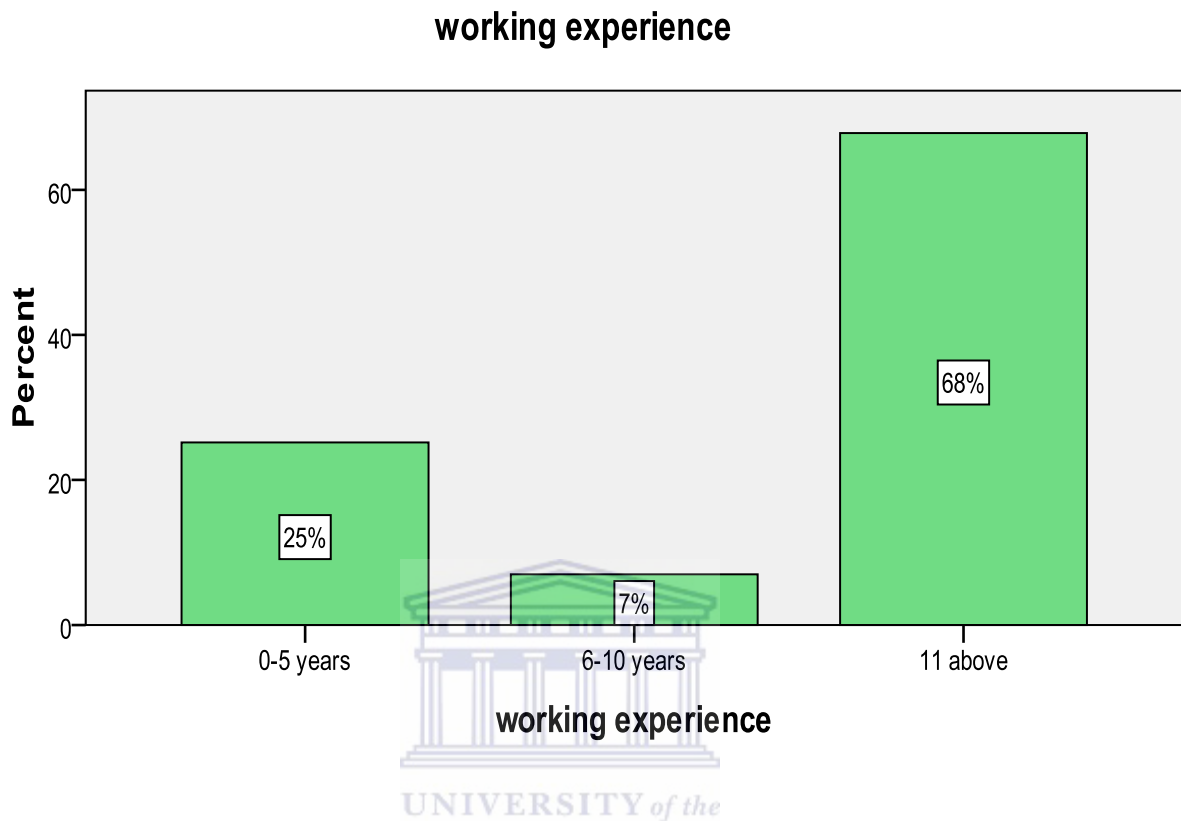
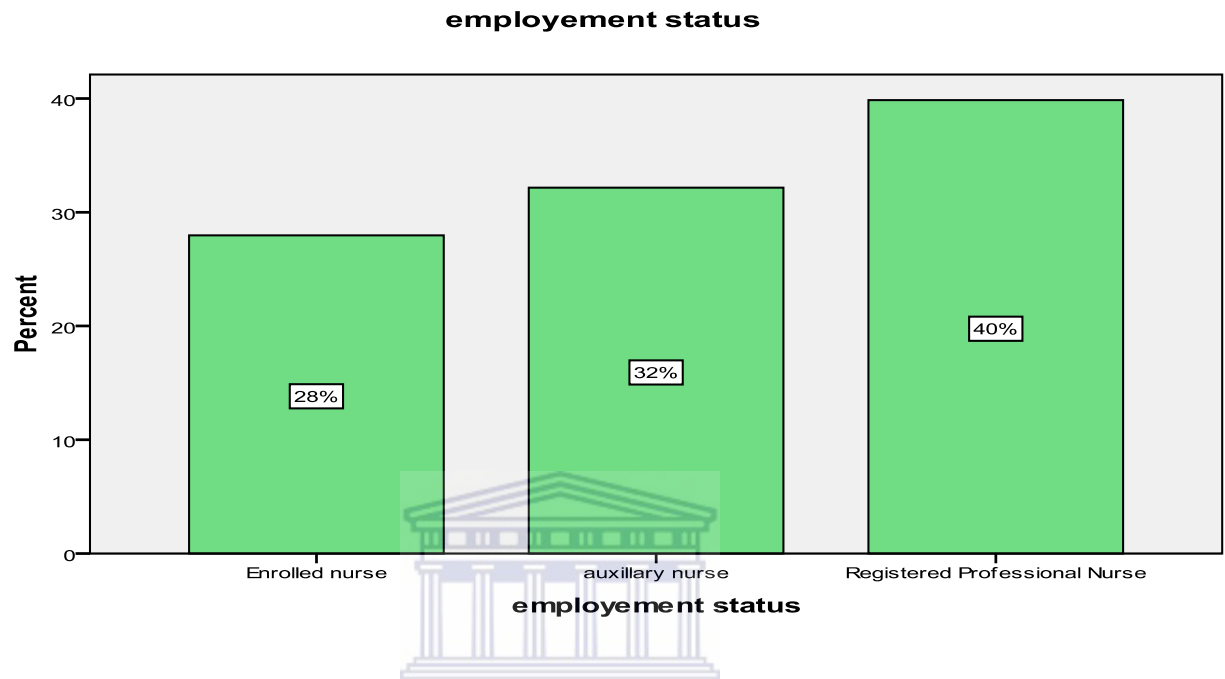


Figure 4.3.3.5 highlights that 25% (36) of the respondents has a clinical experience between 0-5 years. The majority, 68% (97) of the respondents had more than eleven years of clinical experience and these were the more elderly nurses.

Osborne (2003, p.420) states that, older nurses with more working experience are more opposed to changing their behaviour because of their years of experience and practice.

Figure 4.3.3.6: The different categories of nurses (in percentage)



After the data was analysed, the results revealed that the majority of the respondents were professional nurses (40%) and 60% of the respondents were in the other two categories as seen in the bar chart.

Figure 4.3.3.7: The highest qualification amongst the respondents (in percentage)

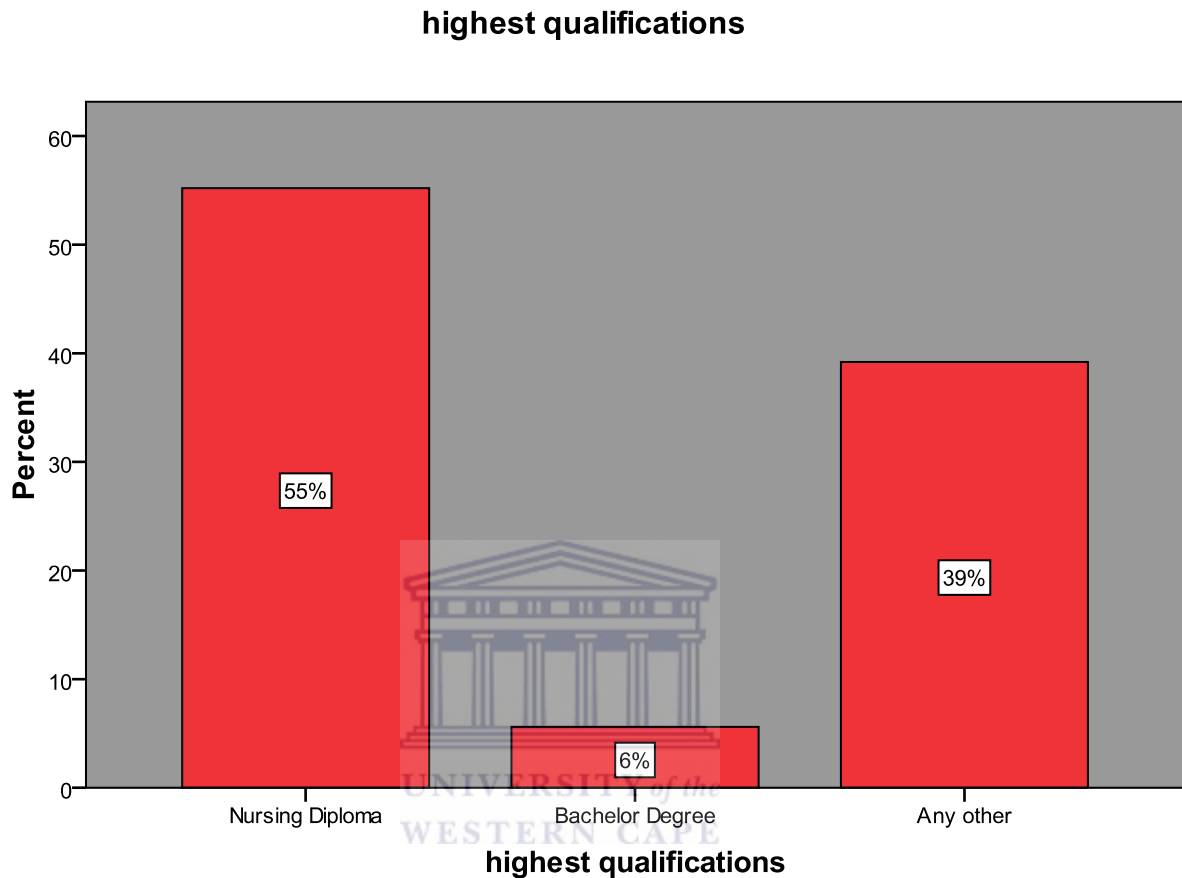


Figure 4.3.3.7 illustrates that only 6% of the 40% nurses in the professional sector have obtained a degree from the university, and the rest obtained a nursing diploma.

SUMMARY

This section gave a clear description of the all the respondents in the sample demographical information. The above mentioned results illustrate that the majority of the respondents in the sample were females, professional nurses and very few of these professional nurses obtained a degree. More than 60% of the respondents were over the age of 40 years and they have working experience of more than 11 years as a nurse.

SECTION 2: Knowledge

The second section in the instrument focuses on level of knowledge of nurses regarding standard precautions. The results are presented in a frequency table in percentages.

Table 4.3.3.8: Frequency (%) of the nurses' knowledge regarding standard precautions

Items	Frequency (%)	
	True	False
The used needles should be disposed into a sharps box after injection.(T)	132 (93.6)	9(6.4)
Standard precautions should be applied to situations that might lead to contact with vaginal discharge. (T)	121(89)	15(11)
Masks and goggles are not necessary if procedures and patient-care activities are likely to cause splashing of blood or exposure to deep body fluids.(F)	20(14.2)	121(85.8)
Standard Precautions are applied to HIV positive and Hepatitis B patients only.(F)	25(18.1)	113(81.9)
Standard precautions should only be applied to hospitalized patients regardless of their infection status.(F)	48(34.5)	91(65.5)
Gloves are necessary in all caring procedures for HIV patients.(F)	90(63.4)	52(36.6)
Used needles should not be placed in a puncture-resistant container.(F)	43(31.2)	95(68.8)
Standard precautions should be applied to situations that might lead to contact with urine. (T)	127(92)	11(8)
As a nurse do you think it is necessary to be immunized?	143(100)	0
Hepatitis B virus can only live for twenty four hours outside the body before it becomes inactive. (F)	41(32.5)	85(67.5)

The correct answer is stated in brackets next to the question (T- true/ F-false)

The results in table 4.3.3.8 shows that 132 (93.6%) of the respondents answered correctly that used needles should be discarded into a sharps box after an injection, and only 95 (68.8%) of the respondents knew that the sharp box must be a puncture resistant but the rest 43 (31.2%) of the respondents answered incorrect. All of the nurses 143 (100%) stated that it is important to be immunized but only 91 (64.1%) of the respondents knew that they should be immunized

with Hepatitis B but 51 (35.9%) of the respondents, more than a third of the sample, did not know that they should be immunized with Hepatitis B. This results show us that, nurses know that they should be immunized, but how many of these nurses get immunized against Hepatitis B, since only 91 (64.1%) of the respondents knew? In the sample, 127 (92%) of the respondents answered correctly that standard precautions should be applied in situations where the nurse is in contact with urine and 121 (89%) of the respondents knew that standard precautions should be applied when in contact with vaginal discharge. There were 121 (85.8%) of the respondents who answered correctly that, masks and goggles are necessary in any nursing care activity or procedure if there is exposure to any body fluids or blood involved. According to the results, 14.5% of the respondents do not know when to use personal equipment when they are working with body fluids or blood.

Some of the nurses in the sample had a misconception when to use standard precautions; because, only 91 (65.5%) of the respondents answered correctly that standard precautions should not only be applied to hospitalized patients but to all of the patients, because any patient can be infected with blood borne infections. Only 52 (36.6%) of the respondents knew that gloves are not necessary for every caring activity or procedure, when the patient is HIV positive; but 90 (63.4%) of the respondents use gloves in any activity or procedure when the patient is HIV positive. This implies that, when the patient is HIV positive 63.4% of the respondents are more likely to overuse the standard precautions just to protect themselves from the HIV positive patient.

According to these above mentioned results, there is a deficit in knowledge regarding the basic principles of standard precautions; for example, some of the nurses in the sample are still not sure when to use standard precautions, only 65.5% of the respondents state that standard precautions should be applied to all patients regardless of their infections and only

64.1% of the nurses in the sample know that they must be immunized against Hepatitis B.

SECTION 3: Perceived severity of threat to health

The third section in the instrument concentrates more on the compliance of standard precautions amongst nurses. In this section, the researcher used a scenario and then asked the nurses questions based on this scenario. The results are presented in a frequency table in percentages. See below the scenario and the table 4.3.3.9 with results.

SCENARIO

Mr. Johnson is 53 years old and is married with two children and four grand children. One day, while Mr. Johnson was riding his bicycle to work, he was hit by a car and sustained multiple injuries. A witness that was driving pass immediately took Mr. Johnson to the nearest hospital.

Table 4.3.3.9: Frequency (%) of the nurse's compliance with regards to standard precautions

Items	Frequency (%)	
	Yes	No
When Mr. Johnson entered the hospital his condition was unstable and cardiac resuscitation was done to save his life. I would use my mouth during cardiac pulmonary resuscitation in order to save any patient life.	30 (21)	113 (79)
When any procedure is being done and there is blood or body fluids involved do you think it is necessary to use gloves? (Y)	142 (99.3)	1 (0.7)
Do you think it is necessary to wash your hands if you had gloves on?	127 (88.8)	16 (11.2)
If Mr. Johnson is HIV negative is it necessary to wear goggles to prevent when blood splashes?(Y)	131 (91.6)	12 (8.4)
Is there a difference in the N95 and surgical masks in terms of safety and how long you can use it?(Y)	117 (89.3)	14 (10.7)

There is a shortage in needles in the hospital; can you use the needle twice if all the patients including Mr. Johnson were tested HIV negative? (N)	2 (1.4)	142 (98.6)
If Mr. Johnson is tested HIV negative and Hepatitis B positive do you think it is necessary to put the linen in a separate bag? (Y)	103 (72.5)	39 (27.5)

The correct answer is stated in brackets next to the question (T yes/ N no).

The results show that 113 (79%) of the respondents answered correctly that they would not use their mouth in cardiac pulmonary resuscitation in order to save a patient's life, and the other 30 (21%) respondents would put themselves at risk in order to save a patient's life by means of mouth to mouth resuscitation without any equipment for protection. The above mentioned item is a very serious concern and this will be dealt with more in depth at the recommendation section.

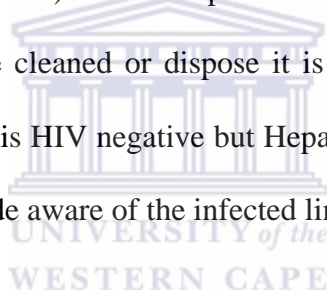
The majority, 142 (99.3%) of the nurses in the sample answered correctly, it is important to use gloves in any procedure when exposed to blood or body fluids but only 118 (83.7%) of the respondents always apply gloves although there is no blood visible in the body fluids. Then, 131 (91.6%) of the respondents replied correctly that, although the patient is HIV negative it is still essential to wear goggles to prevent blood splashes because, you are still at risk of getting infected with any other blood borne infections. There are 117(89.3%) of the nurses that answered correctly, they know there is a difference in the protection of the two masks.

Hand washing is one of the most important activities to prevent cross infection and the results reveal that 143 (100%) of the respondents said that it is important to wash your hands every time between all the patients but only 127 (88.8%) of the respondents replied that they always wash their hands after they have removed the gloves but the rest of the respondents do not think it is necessary. The prevention of cross infection through hand washing is also a very

serious matter, and this will also be dealt with more in depth in the recommendation section.

According to the results in table 4.3.3.9, 141 (98.6%) of the respondents replied that, if there is a shortage of needles in the hospital, the needles should not be used twice, it does not matter if all the patients are HIV negative or not. After needles have been used, 15 (10.9%) of the respondents replied the needles must be recapped, 18 (13%) replied they remove the needles by hand and 95 (68.8%) of the respondents answered the question correctly, they said they discard the needle without recapping or removing the needle to reduce needle prick injuries. Although 95 (68.8%) of the respondents were doing the correct procedure there were still 43 (31.2%) of the respondents that are at risk of a needle prick injury.

The results showed that 103 (72.5%) of the respondents answered correctly, for instance, when the dirty linen needs to be cleaned or dispose it is important to place the linen in a separate bag although the patient is HIV negative but Hepatitis B positive. So that the people who are cleaning the linen be made aware of the infected linen.



SECTION 4: Factors influencing the nurse's compliance

This section in the instrument, concentrates more on the factors that could influence the compliance or non compliance of standard precautions. This section focuses on the factors that could be perceived as a barrier or a benefit when applying standard precautions. The results are presented in a table in percentages. Please see table 4.3.3.10

Table 4.3.3.10: Frequency (%) of the factors influencing the nurse's compliance

Items	Frequency (%)	
	Yes	No
Do you think the area where you work has enough protective equipment for example gloves, masks and gowns?	85 (59.9)	57 (40.1)
If you have insufficient protective equipment in your work area do you think that it could influence applying standard precautions?	132 (93)	10 (7)
Do you receive training how to wear these protective equipment	92 (65.2)	49 (34.8)
Do you think it is necessary to receive training regarding standard precautions or infection control?	137 (96.5)	5 (3.5)
Do you think when you are wearing gloves it interferes when rendering nursing care?	36 (25.9)	103 (74.1)

The results presented in table 4.3.3.10 highlights that only 85 (59.9%) of the respondents replied that they have enough personal protective equipment in their work area and 57 (40.1%) of the respondents have no equipment in their work area. The majority, 132 (93%) of the respondents replied that, if there is a lack in protective equipment, it can influence the compliance of standard precautions. According to these two results, there are still many work areas in the hospital that have a lack in personal protective equipment.

Only 92 (65.2%) of the respondents do receive training regarding protective equipment and 49 (34.8%) of the respondents do not receive any training regarding protective equipment for example how to use it, how long you can use it and when you must used it in the hospital. If these respondents do not receive any training how will they be able to protect themselves?

There were 137 (96.5%) of the respondents who think it is essential to receive training regarding infection control or standard precautions, but only 72 (51.4%) of the respondents

had received one or more than two sessions regarding standard precautions and 68 (48.6%) of the respondents never had a session regarding infection control or standard precautions. Almost half of the nurses in the sample did not receive any training regarding standard precautions or infection control this year.

The results show that, 36 (25.9%) of the respondents think that gloves would interfere with your nursing care while 103(74.1%) of the respondents feel that wearing gloves does not interfere with nursing care.

4.3.4 THE ASSOCIATION BETWEEN THE NURSE'S KNOWLEDGE AND COMPLIANCE REGARDING STANDARD PRECAUTIONS

In the study, the researcher aimed to determine whether there is an association between the nurses' knowledge and the compliance regarding standard precautions. The researcher performed cross tabulations with chi-square test on all the items pertaining to nurses' knowledge and the compliance regarding standard precautions, to determine if there was any statistical significant association between these items. According to de Vos, Delport, Fouche & Strydom (2005, p.242), they stated that the test for statistical significance was implemented by the use of the level of significance. The level of significance that was used for this study was 0.05. If the level of significance is more than 0.05, then there is no association between the items. According to the statistical analysis that was done, there was no association found between nurses' knowledge regarding standard precautions, and the compliance of standard precautions.

4.3.5 THE ASSOCIATIONS BETWEEN THE DEMOGRAPHIC, KNOWLEDGE AND COMPLIANCE ITEMS

The researcher also performed cross tabulations with chi-square tests to determine any association between the demographic items, nurses' knowledge and compliance variables regarding standard precautions. Only those that were statistically significant will be reported on in this section.

A cross tabulation with chi-square test was performed with the respondents different age groups and the using of gloves when working with body fluids without any visible blood. The cross tabulation and the chi-square test illustrate that, 100% of the respondents between the ages 18 and 25 years old, always apply gloves when working with body fluids without any visible blood. There were 92.9% of the respondents in the age group between 26-30 years and 85.7% of the respondents between the ages 31-35 years stated that they always apply gloves when working with body fluids without any visible blood. There were only 62.1% of the respondents between the ages of 36-40 years that stated they always apply gloves and the other 37.9% of the respondents in this age group stated they often apply gloves when working with any body fluids without visible blood. In the age group above 40 years, 1.4% of the respondents never use gloves, 10% of the respondents stated they often use and 88.6% of the respondents stated that they always apply gloves when working with body fluids without any visible blood. There was association between the different age groups and the using of gloves without any visible blood because the level of significance was 0.043. Therefore, we can be 95% sure that this association is not due to chance but it is statistically significant. This implies that we can be 95% sure that the using of gloves when working with body fluids and no blood is visible is associated with the different age groups specifically with the age group between 18-25 years. According to the results it was also noted that the respondents in the

younger age groups are more compliant than the older respondents.

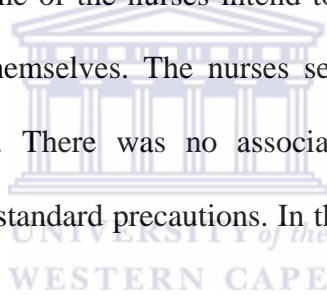
A cross tabulation with chi-square test was performed to determine if there is an association between registered nurses and the manner of discarding used needles. The cross tabulation illustrated that 87.5% of the professional nurses in the sample discard used needles without recapping or manually removing the used needles, but there is still 1.8% of the professional nurses in the sample that recap, and 8.9% of these nurses also manually remove the used needles before discarding. There were 27% of the enrolled nurses in the sample who remove the used needles with the hand after injection and 8.1% of these nurses still recap needles before discarding the needles. There were 25% of the auxiliary nurses who still recap needles and 4.5% of these nurses who manually remove used needles from the injection before discarding. In both the auxiliary and enrolled categories 56.8% of the nursing respondents in each of these categories do not recap or remove used needles manually. An association was detected between the different categories in nursing and the manner of discarding used needles because the level of significance was 0.00, less than 0.05. Therefore, we can be 95% sure that there is a relationship between professional nurses and discarding of used needles.

A cross tabulation with chi-square test was performed to determine if there is an association between the nurses' working experience and the manner of discarding used needles. The cross tabulation illustrated that the nurses that have working experience between 6-10 years, 80% of these nurses do not recap or remove the used needle after an injection. The respondents that have working experience between 0-5 years, 20.6% of the respondents recap their needles, 26.5% of the respondents remove the used needles with their hands after injection and 44.1% of the respondents do not recap or remove the used needle by hand before discarding the needle. The nurses who work more than 11 years, 76.6% of these respondents does not recap or remove the used needle after an injection but 8.5% of these

respondents recap their used needles and 8.5% of the respondents also remove the needle after an injection. The level of significance between these two variables was 0.01, and because it is less than 0.05, association was detected between the nurses' working experience and the manner of discarding used needles. This result illustrates that, the nurses working experience does relate to the manner in which used needles are discarded.

4.3.6 SUMMARY

The findings of the study reported a response rate of 94% which was very good. The results of the study showed that there was a lack in nurses' knowledge regarding standard precautions. The results of the questionnaire also indicates that when the nurses perceive the severity of the infection then some of the nurses intend to over use the personal protective equipment in order to protect themselves. The nurses self reported compliance regarding standard precautions was good. There was no association found between the nurses' knowledge and compliance with standard precautions. In the next chapter these findings will be discussed more in depth.



CHAPTER 5

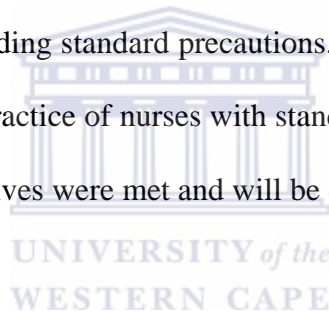
SUMMARY OF THE FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

This chapter consists of a discussion of the findings and how these findings are related to the literature. Recommendations for further study will also be included in this chapter.

5.2 Objectives of the study

The aims of the study were to determine the nurses' working at Tygerberg Hospital knowledge and compliance regarding standard precautions. It was also done to determine the factors that could influence the practice of nurses with standard precautions. According to the results of the study, all the objectives were met and will be discussed in this chapter.



5.2.1 Knowledge with regards to standard precautions

The first objective of this study was to determine the nurses' self reported knowledge regarding standard precautions. According to the results of the study, the mean score of the nurses' overall knowledge regarding standard precautions was 75.6%. This score relates to a study that was done by Van Gemert-Pijnen, Hendrix, Van der Palen & Schellens (2006, p.171-172) to assess the health care workers (nurses, physicians, laboratory technicians and cleaners) knowledge and attitudes towards the compliance with the safety precautions stipulated in the protocols. The findings of this study indicates that the nurses overall knowledge was 76% and according to the findings of the study researchers conclude that health care workers have insufficient knowledge. The basic principles regarding standard

precautions are very important in every nurse's career because when knowledge are applied to practice it can prevent the nurse from work- related blood borne diseases. Whitehead & Russell (2004, p.163-172) stated that health care workers that have inadequate knowledge about the transmission of blood borne infections can lead to incorrect decisions. Therefore it is essential that every nurse have adequate knowledge about the policies, protocols and basic principles regarding standard precautions. The results of this study also indicated that most of the nurses knew that standard precautions should be applied to all patients' whether they are infected with Hepatitis B and HIV or not. In contrast with other literature (Cutter & Jordan, 2004, p.445; Kermode et al., 2005, p.29; Reda, Vandeweerd, Syre & Egata, 2009, p.165; Preston, Forti & Kassab, 2002, p.34-45) most of nurses only apply standard precautions if they knew the blood borne viral status of the patients. In the above mentioned literature some of the nurses feel that they should only protect themselves if they are working with infected blood because they feel it is not possible to treat all blood if it was infected. Therefore the findings of the study showed that 63.4% of the nurses in the sample use gloves in all nursing care activities when they know the patient are HIV positive.

According to the results, respondents are uncomfortable when working with HIV positive patients because nurses perceive the severity of the disease. Nurses become scared of getting infected with HIV/Aids and then they overuse the usage of gloves in order to protect themselves because they are unsure of the transmission of HIV/Aids. According to the literature (Preston, Forti & Kassab, 2002, p.34-45) if the nurse finds out that the patient is HIV positive then the nurses uses more gloves for all other nursing procedures for example feeding or bathing the patients.

The findings of this study showed that all the respondents knew that it is important to be immunized but only 64.1% of the respondents knew that they should be immunized with

Hepatitis B. This means that all the respondents knew they must get immunizations but not all of them had received a Hepatitis B immunization. These literature (Ofili, Asuzu, & Okojie, 2003; Talaat et.al, 2003, p.469-474) shows that very few nurses went to get the Hepatitis B vaccine because (Farren, McEwen, 2005, p.230-239) they were concern about the side effects and they had doubt about the effectiveness of the hepatitis vaccine.

5.2.2 Nurses compliance regarding standard precautions

The second objective of the study was to determine the nurses' self reported compliance regarding standard precautions at Tygerberg Hospital. According to the results of the study, the mean score for the nurses overall compliance regarding standard precautions was 87.5%. Literature shows that many studies have indicated that health care workers compliance regarding standard precautions is relatively low but in this study the nurses' compliance was relatively high. The results of this study illustrate that the nurses' compliance is relatively higher than the knowledge regarding standard precautions. Therefore the findings of this study show that the nurses' compliance was not influenced by their lack of knowledge. Kagan, Ovadia & Kaneti (2009, p.17) stated that nurses' actions are influenced more by their personal beliefs and attitudes and less by knowledge. The findings of the study also showed no relationship between knowledge and compliance with regards to standard precautions.

Discarding of used needles is a very important aspect of standard precautions because it can prevent a needle prick injury. The majority of the respondents knew that used needles should be disposed into sharp box but only 68.8% of the respondents knew that it should be puncture-resistant container. According to the literature (Talaat et.al, 2003, p.469-474) some of the health care workers dispose used needles into wastebaskets that collects the hospital

garbage. The health care workers states that sometimes carton boxes and plastic bottles are used as sharp containers and this can cause an increase of needle prick injuries. Therefore it is important that every health care facility has appropriate and sufficient waste disposal equipment to prevent any injuries from occurring.

All of the nurses in the sample stated that it is essential to wash your hands after each procedure or providing nursing care to other patients and after the usage of gloves. According to literature (Sharir, Teitler, Lavi & Raz, 2001, p.56) nurses that are working in the intensive care units have a higher compliance of hand washing than nurses working in an emergency department and general wards. The literature also shows that the compliance of hand washing is higher when there is direct contact with potentially contaminated fluids than after invasive procedures. Literature (Zimakoff, Stormark & Larsen, 1993, p. 65) also shows that health care workers wash their hands more often after the usage of gloves than when gloves had not been used. Zimakoff, Stormark & Larsen(1993,p.67) stated that the use of gloves encourages hand washing because of the moist feeling on the hands after the removal of gloves and it can also give an indication that majority of the health care workers is aware of the hygienic aspects and the washing of hands. Therefore hand washing is very important to prevent cross infections between patients.

The majority of the nurses in the study also indicated that they knew it is important to wear masks, gloves and goggles when procedures are likely to cause exposure of blood or any body fluids but how many of these nurses wear the masks and the goggles. According to the findings nurses always wear gloves when working with body fluids without visible blood. Ganczak & Szych (2007, p.346-351) evaluated the compliance of personal protective equipment amongst surgical nurses and the factors that is associated with both compliance and noncompliance of personal protective equipment by using a self reported questionnaire.

The findings of the study revealed that there was high compliance with glove usage but only 5% of the respondents used masks, protective eyewear and gowns when in contact with potentially infected material. The findings of the study also showed that nurses who fear acquiring HIV and nurses with previous training in infection control or experience of caring for an HIV patient, those are the nurses that are more compliant.

5.2.3 Factors influencing the nurses' compliance regarding standard precautions

The third objective of this study was to determine the perceived barriers that could influence the nurses' compliance and knowledge regarding standard precautions. According to the results of this study, the majority (93%) of the respondents in the sample state that insufficient PPE in the workplace can influence the nurses' compliance and 40% of the respondents stated that they don't have enough PPE in their work area and this is a problem because insufficient PPE can be the cause of an occupational blood-related accident. Ofili, Asuzu & Okojie (2003, p. 334) stated that there are four main factors responsible for these blood-related accidents but the major factor responsible for the accidents at work is due to the non-availability and inadequate supply of personal protective equipment, health workers are unnecessarily exposed to blood, body fluids and used needles. Therefore it is essential that all hospitals and health care facilities have sufficient personal protective equipment in order to protect the nurses.

The findings of the study showed that 96.5% (137) of the respondents stated that it is very important to receive training regarding the basic principles, policies and protocols of standard precautions. These training sessions are very important because they increase the nurses' knowledge. Beers & Bowden (2005, p. 511-514) stated the importance of educational

approaches in the increase of knowledge. The mean score indicates that nurses' have inadequate knowledge regarding standard precautions and it can be due to that almost half of the respondents in the sample stated that they never had a session regarding infection control or standard precautions.

Therefore it is important that every hospital or health care facility hold training sessions or any other educational approach for all the nurses to improve their knowledge and practice regarding standard precautions and infection control.

Another factor that could influence the nurses' compliance regarding standard precautions are 25.9% (36) of the respondents think that gloves would interfere while rendering nursing care to the patient. Ganczak & Szych (2007, p.349) stated that gloves is very important because it protects the staff from contagious diseases, gloves also protect patients from micro-organisms during any surgical procedure and the insertion of invasive devices as well as care givers that may be carriers of blood-borne viruses. Therefore it is important to wear gloves in order to protect the health care workers.

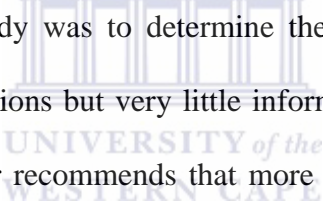
5.3 RELATIONSHIP BETWEEN KNOWLEDGE AND COMPLIANCE

As seen in chapter 4, there was no association found between the nurses overall knowledge and compliance regarding standard precautions. Although a few significant relationships was found between the demographic and compliance variables. However, based on the findings the nurses overall mean compliance was not influenced by the lack of knowledge.

5.4 RECOMMENDATIONS

5.4.1 Future research projects

More research is needed regarding this topic because there is very little literature found being done in South Africa. The same study could be replicated to reinforce results or a future study can be done to investigate the nurses' compliance regarding standard precautions by observing the nurses while they are using the standard precautions. Future research projects can also explore the perception and attitudes of nurses regarding the compliance of standard precautions by using of a qualitative study. Future research can also be done on how sufficient knowledge improves the practice of standard precautions.



One of the objectives in the study was to determine the factors that could influence the compliance with standard precautions but very little information was gained from results of the study therefore the researcher recommends that more focus should be on the factors in general and how these factors can influence the compliance with standard precautions in hospitals.

5.4.2 Recommendations specific to the study

Standard precautions is very important in any health care facility to protect the nurses and other patients from being infected with any blood borne infections therefore it is necessary for each nurse to have a basic understanding of what standard precautions is all about and in which situations to use these standard precautions. Therefore the researcher recommends that nurses need to be educated in their wards about infection control and standard precautions

almost once a week on each shift. It is also important that all the nurses be informed about all the new policies and protocols regarding standard precautions through in service training in all wards and units because this is very important. Nursing schools and colleges should supply the young nurses with more knowledge and skills regarding standard precautions. As a result when the nurse starts working permanently at the hospital he or she will know exactly how to protect them from any injury. Every nurse should get the opportunity to attend in service training because all nurses need to be informed about the latest information regarding standard precautions and infection control because it is for their own safety.

5.5 LIMITATIONS

In this study, the researcher used self reported questionnaires to measure the nurses overall knowledge and compliance regarding standard precautions. According to Henry, Campbell & Maki (1992, p. 940-946) when nurses self report on their compliance regarding standard precautions it is normally high but the actual compliance it is much less then reported on. Therefore I would recommend for future research that an observational study should be done in order to determine the nurses' compliance regarding standard precautions.

All the questions in the questionnaire consist out of close ended questions and the respondents could not express themselves so for future research I would recommend that more open ended questions should be included in the questionnaire.

5.6 CONCLUSION

This study has shown that the nurses working at Tygerberg Hospital have insufficient levels of knowledge but they have a good compliance rate regarding standard precautions. This illustrates that although the nurses have insufficient knowledge it did not influence their practice. The majority of the nurses indicate that when patient is HIV positive they would use gloves for every nursing activity that needs be done and this definitely shows that when the patient HIV positive they would overuse PPE to protect themselves because then they realize the severity and susceptibility of the disease. This also gives a clear indication that if their knowledge was up to standard they would have known when to use gloves or not. There is still insufficient supply of PPE in Tygerberg Hospital in order to protect the nurses from any blood borne related injury. Therefore it is very important that every ward and unit should have enough PPE to increase compliance amongst the nurses and more educational approaches needs to be implemented so that every nurse from young to old is updated about the policies, protocols and basic principles of standard precautions.

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HIGHER DEGREES COMMITTEE

21 August 2009

TO WHOM IT MAY CONCERN

Dear Sir/Madam

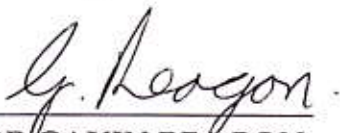
Research Project of MS JOANNEIL DUMINY (Student Number: 2324113)

This letter confirms that Ms Duminy is a registered student in the Faculty of Community and Health Sciences at the University of the Western Cape.

Her research proposal entitled "*An investigation into the knowledge and compliance with universal precautions amongst nurses' in a tertiary hospital in the Western Cape*" submitted in fulfilment of the requirements for Magister Curationis (M. Cur) has been examined by the Higher Degrees Committee and found to be of high scientific value, methodologically sound and ethical.

We fully support the research and kindly request that you allow her access to your organization.

Sincerely



DR GAVIN REAGON

Chairperson: Higher Degrees Committee



UNIVERSITY of the
WESTERN CAPE

RESEARCH PROJECTS

PROTOCOL NUMBER:

An investigation into the knowledge and compliance with universal precautions amongst nurses in a tertiary hospital in the Western Cape.

ETHICS REF:

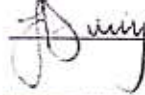
Research conducted by: Ms J M Duminy

NAME	APPROVED	SIGNATURE	COMMENT	DATE FORWARDED
Ms J Jooste Asst Director	✓		No pt records / fees - not used	15/09/2009
Mr P J Wolfaardt Deputy Director	✓			16/9/09
Ms R Basson Dep Dir: Nursing	NO ✓ ^{RMB}	RMBasson	Not complete! RMB Documents missing	17/9/09
Ms C Ford Dep Dir: Pharmacy	✓	J.C. Ford	No pharmaceuticals involved.	21/09/09
Dr R Thomson Clinical Executive				
Dr M Mukosi Clinical Executive	?		Letter on appendix C should that there will be impact on nurses, but the signed relation is contrary	23/09/2009
Dr T Carter Chief Director	✓			27/10/09

Contact Details

Ms J M Duminy / 020 1256

Collected by



Date

09/10/09

/Research Projects voorblad desktop
14.09.2009

**TERUG NA MEV L BINDEMAN , ADMIN
NADAT ALMAL GETEKEN HET.**



Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959, Fax: 27 21-959
E-mail:

INFORMATION SHEET

Project Title: An investigation into the knowledge and compliance with standard precautions amongst nurses' in a tertiary hospital in the Western Cape

What is this study about?

This is a research project being conducted by Ms. Joanneil Merl Duminy at the University of the Western Cape. We are inviting you to participate in this research project because you are the best person that can give us accurate information. The purpose of this research project is to determine the nurses knowledge and compliance with standard precautions.

What will I be asked to do if I agree to participate?

You will be asked to complete a short questionnaire that will take you approximately 10 to 20 minutes. This will be taking place at the hospital where you are working in that specific ward. You don't have to worry about anything because everything is confidential

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, I will be making use of identification codes only on the data forms and these forms will be collected by myself and will be stored away. So these are anonymous and your name will not be place on the questionnaire only the code then identification key will be used for only the researcher to link the code to your identity.

If we write a report or article about this research project, your identity will be protected to the maximum extent possible.

In accordance with legal requirements and/or professional standards, we will disclose to the appropriate individuals and/or authorities information that comes to our attention concerning child abuse or neglect or potential harm to you or others.

What are the risks of this research?

There may be some risks from participating in this research study. There are no known risk at that could harm you during this study but if you feel that this study has psychological or emotional or any other sort of risk to yourself. You have the right to withdraw.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the investigator learn more about the compliance with standard precautions and also to improve the nurses' knowledge. We hope that, in the future, other people might benefit from this study through improved understanding of importance of infection control.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

Is any assistance available if I am negatively affected by participating in this study?

If this study have harm psychologically or emotionally or in any other way please feel free to talk to me there will be counselling available or referral if necessary.

What if I have questions?

This research is being conducted by MS.Joanneil Merl Duminy, Nursing Department at the University of the Western Cape. If you have any questions about the research study itself, please contact J.M.Duminy at: 084 050 1266 or email me 2324113@uwc.ac.za

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

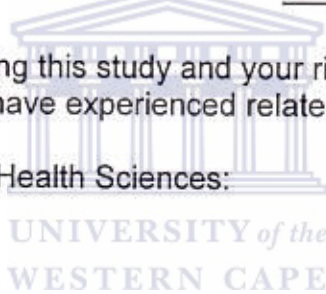
Head of Department:

Dean of the Faculty of Community and Health Sciences:

University of the Western Cape

Private Bag X17

Bellville 7535



This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee



UNIVERSITY OF THE WESTERN CAPE

APPENDIX D

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959, Fax: 27 21-959

E-mail:

CONSENT FORM

An investigation into the knowledge and compliance with standard precautions amongst nurses in a tertiary hospital in the Western Cape

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name.....

Participant's signature.....

Date.....



Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Study Coordinator's Name: Prof E.Kortenbout

University of the Western Cape

Private Bag X17, Belville 7535

Telephone: (021)959-2274

Email: ekortenbout@uwc.ac.za

QUESTIONNAIRE

The aim of this study is to investigate the knowledge and compliance of standard precautions amongst nurses'. This survey is anonymous and confidential. Your participation in this study is strictly voluntary and will in no way affect your relationship with your employers. To help protect your confidentiality, I will be making use of identification codes only on the data forms and these forms will be collected by myself and will be stored away. So these are anonymous and your name will not be place on the questionnaire only the code then identification key will be used for only the researcher to link the code to your identity. If you do agree to participate in this research, please complete this questionnaire and return it to the researcher.

Please tick the answer that you feel is most appropriate.

SECTION 1

1. What gender are you?		
a	Male	1
b	Female	2

2. In what age category do you fall into?		
a	between 18 -25	1
b	between 26-30	2
c	between 31-35	3
d	between 36-40	4
e	above 40	5

3. What are your highest qualifications obtained?		
a	Nursing Diploma	1
b	Bachelor degree	2
c	Masters degree	3
d	Any other	4

4. What is your employment status?		
a	Enrolled nurse	1
b	Auxiliary nurse	2
c	Registered professional nurse	3

5. How long have you worked as a nurse?		
a	0-5 years	1
b	6-10 years	2
c	11 or above	3

7. In which department in Tygerberg Hospital are you working?		
a	Surgery	1
b	Peadiatrics	2
c	Outpatient Department	3
d	Internal Medicine	4
e	Obstetrics	5
f	Emergency Services	6
g	Intensive Care Units	7
h	Theatre	8

6. Whom are you working for today?		
a.	Nursing Agency	1
b.	Tygerberg Hospital	2

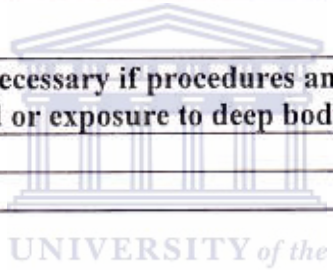
SECTION 2

Please circle one of the answers that you feel is correct.

1. The used needles should be disposed into a sharps box after injection		
a.	True	1
b.	False	2

2. Standard precautions should apply to situations that might lead to contact with vaginal discharge		
a.	True	1
b.	False	2

3. Masks and goggles are not necessary if procedures and patient-care activities are likely to cause splashing of blood or exposure to deep body fluids		
a.	True	1
b.	False	2



4. Standard precautions are applied to HIV positive and Hepatitis B patients only.		
a.	True	1
b.	False	2

5. Standard precautions should only be applied to hospitalized patients regardless of their infection status.		
a.	True	1
b.	False	2

6. Gloves are necessary in all caring procedures for HIV patients		
a.	True	1
b.	False	2

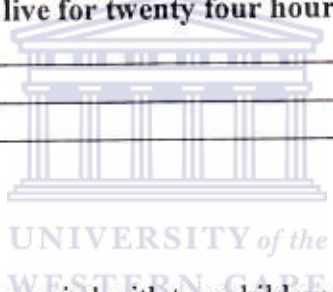
7. Used needles should not be placed in a puncture-resistant container.		
a.	True	1
b.	False	2

8. Standard precautions should be applied to situations that might lead to contact with urine.		
a. True	1	
b. False	2	

9. As a nurse do you think it is necessary to be immunized?		
a. Yes	1	
b. No	2	

10. If yes, which immunization is necessary?		
a. Hepatitis E	1	
b. Hepatitis D	2	
c. Hepatitis B	3	
d. all of the above	4	

11. Hepatitis B virus can only live for twenty four hours outside the body before it becomes inactive		
a. True	1	
b. False	2	



SECTION 3

Mr. Johnson is 53 years old and is married with two children and four grand children. One day while Mr. Johnson was riding his bicycle to work, he was hit by a car and sustained multiple injuries. A witness that was driving pass immediately took Mr. Johnson to the nearest hospital.

1. When Mr. Johnson entered the hospital his condition was unstable and cardiac pulmonary resuscitation was done to save his life. I would use my mouth during cardiac pulmonary resuscitation in order to save any patient life.		
a. Yes	1	
b. No	2	

2. When any procedure is being done and there is blood or body fluids involved do you think it is necessary to use gloves?		
a. Yes	1	
b. No	2	

3. When providing nursing care or doing any procedure on Mr. Johnson and other patients is it necessary to wash your hands every time?		
a. Always	1	
b. Sometimes	2	
c. Only if dirty	3	

4. Do you think it is necessary to wash your hands if you had gloves on?		
a. Yes	1	
b. No	2	

5. After injecting Mr. Johnson do you think needles must be recapped or removed by hand to prevent any injuries?		
a. Recap needles	1	
b. Remove the needles by hand	2	
c. None of the above	3	
d. Recap and remove needles by hand	4	

6. If Mr. Johnson is HIV negative is it necessary to wear goggles to prevent when blood splashes?		
a. Yes	1	
b. No	2	

7. Is there a difference in the N95 and surgical masks in terms of safety and how long you can use it?		
a. Yes	1	
b. No	2	

8. There is a shortage in needles in the hospital; can you use the needle twice if all the patients including Mr. Johnson were tested HIV negative?		
a. Yes	1	
b. No	2	

9. If Mr. Johnson is tested HIV negative and Hepatitis B positive do you think it is necessary to put the linen in a separate bag?		
a. Yes	1	
b. No	2	

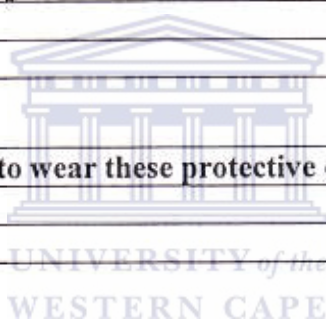
10. When working with body fluids without visible blood do you work with gloves?		
a. Never	1	
b. Often	2	
c. Always		

SECTION 4

1. Do you think the area where you work has enough protective equipment for example gloves, masks and gowns?		
a. Yes	1	
b. No	2	

2. If you have insufficient protective equipment in your work area do you think that it could influence applying standard precautions?		
a. Yes	1	
b. No	2	

3. Do you receive training how to wear these protective equipment?		
a. Yes	1	
b. No	2	



4. Do you think it is necessary to receive training regarding standard precautions or infection control?		
a. Yes	1	
b. No	2	

5. If yes, how many training sessions did you receive in this year?		
a. less than two	1	
b. more than two	2	
c. none	3	

6. Do you think when you are wearing gloves it interferes when rendering nursing care?		
a. Yes	1	
b. No	2	

THANK YOU FOR PARTICIPATING!!!

APPENDIX F

DECLARATION

I, Mrs. Melanie Bailey, ID 4101139941082, declare that I edited the master's thesis entitled,
An investigation into the knowledge and compliance with standard precautions amongst
nurses in Tygerberg Hospital in the Western Cape on the 25 and 26 February 2011.

Signed: *M Bailey*

