

**KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING  
THE PREVENTION OF HEPATITIS B VIRUS INFECTIONS, IN  
FINAL YEAR COLLEGE STUDENT NURSES IN GAUTENG  
PROVINCE**

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## **Declaration**

I, Mpho Margaret Satekge declare that this research report is my own work.

This report is being submitted for the degree of Master of Public Health (MPH) in the University of Limpopo, MEDUNSA Campus, Pretoria. It has not been submitted before any degree or examination at this or any other University.

Ethics Committee, for Research on human Subjects Clearance certificate number: MREC/PH/141/2008:PG.

Signed.....

Date... .15.....day .....April.....of...2010.....year

## **Dedication**

I dedicate this work to my daughters Dineo, Matshepo my sons Thabo and in memory of my beloved late son Radjadji. I really appreciate the support you have given me throughout this process

## **Acknowledgment**

I would like to thank my God Father and the following people without whom my research would not have been possible.

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## ABSTRACT

**Introduction:** Hepatitis B infection is a serious blood-borne disease caused by the hepatitis B virus (HBV) which attacks the liver, and is the leading cause of liver cancer and cirrhosis of the liver. HBV can be transmitted through exposure to infected blood and human secretions through needle stick / sharps injuries and splashes. Thus nurses are at high risk for HBV infection.

**The aim of the study:** To investigate the knowledge, attitudes and practices (KAP) regarding the prevention of hepatitis B virus infections, in final year college student nurses in Gauteng province.

**Methods:** A cross-sectional quantitative survey on 350 final year nursing students was conducted in three Gauteng province nursing colleges, using an anonymous self administered questionnaire with questions on knowledge, attitudes, and practices regarding HBV. The data were analysed using SPSS (statistical package for social science studies).

**Results:** Of 350 questionnaires distributed, 312 student nurses returned completed forms (response rate: 89.14% [312/350]). The majority were females (86.8% [270/331]) and were below 31 years of age (30.1% [93/309]). The majority (87.6% [271/310]) had good knowledge of the causes and prevention of HBV. The unvaccinated respondents had fairly low positive attitudes, with a mean, mode and median score of 1 (possible score from -4 to +4). The majority (79% [244/310]) practiced good compliance with universal precautions of, and the majority (64.9% [202/311]) were vaccinated. College A displayed significantly higher knowledge ( $p<0.001$ ), positive attitudes ( $p=0.001$ ) and safer practices ( $p<0.001$ ) than college B and C.

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## LIST OF ABBREVIATIONS

DOH	Department of Health
CDC	Centre for Chronic Disease Control
HCWs	Health Care Workers
HBV	Hepatitis B virus
HBsAG	Hepatitis B surface antigen
Anti-HBc	antibody to hepatitis Bcore antigen
IgM	immonoglobulin M
HBIG	Hepatitis B immunoglobulin G
KAP	Knowledge Attitude Practices
PEP	Post exposuxure prophylaxis
UP	Universal precautions
WHO	World Health.Organization



## **CHAPTER 1:**

### **INTRODUCTION**

#### **1.1. BACKGROUND TO THE STUDY**

Hepatitis B infection is a serious blood-borne disease, caused by the hepatitis B virus (HBV) which attacks the liver, and although in acute cases rarely results in liver failure and death, the main public health problem is that this can lead to lifelong chronic HBV infection, which may be followed by cirrhosis and/or liver cancer. Chronically infected HBV carriers are able to transmit HBV through contact with their body fluids, which includes occupational exposure to their blood and secretions, sexual intercourse. People at risk include health care workers (HCWs) in contact with blood and human secretions, haemodialysis staff, oncology and chemotherapy nurses, all personnel at risk of needle stick/sharps injuries, which includes those working in operating rooms and clinical laboratories, respiratory therapists, surgeons, doctors, dentists, as well as medical, dental and nursing students (Smelzer and Bare 2003: 1096). There is a highly efficacious vaccine that protects against HBV infection, and it is recommended by the South African Department of Health (DOH) that all HCWs should be vaccinated against HBV before being exposed to patients (DOH, 2005:3).

#### **1.2 PROBLEM STATEMENT**

From their first year of training, student nurses undergoing training for the four-year Registered Nurse program in Gauteng nursing colleges are placed in the wards and clinics for practical and clinical experience. Their clinical practical involve basic nursing care, wounds care, taking of blood, administration of injections, and childbirth, whilst the theoretical content of the course includes measures to control infections, infectious diseases and preventive measures and management (Gauteng nursing curriculum, 2002:58). Previous studies have shown that many South African (SA) nurses including students are not protected against HBV despite the training and availability of the HBV vaccine, and occupational exposures to HBV are happening (Kotzee et al 2006: 40).

### **1.3. RATIONALE OF THE STUDY**

This study will highlight the extent of non-immunization of student nurses at risk for occupational exposure, and link this to their knowledge and attitudes regarding HBV infection and hepatitis B vaccination. This will assist the college managers in collaboration with the clinical facilities managers to be aware of the extent of vaccination uptake, and develop strategies for promoting and improving HBV immunization uptake amongst student nurses if coverage is found to be low.

### **1.4. PURPOSE OF THE STUDY**

#### **1.4.1 Research questions:**

The purpose of the study was to answer the following research questions:

- What is the level of knowledge about HBV prevention among final year nursing students in Gauteng province?
- What are attitudes towards HBV prevention among final year nursing students in Gauteng province?
- What are the practices among the regarding HBV prevention among final year nursing students in Gauteng province?
- Is there a difference in HBV knowledge attitudes and practices among final year nursing students in three different nursing colleges of Gauteng province?

#### **1.4.2 Aim of the study:**

To investigate the knowledge, attitudes and practices (KAP) regarding the prevention of hepatitis B virus infections, in final year college student nurses in Gauteng province.

#### **1.4.3 Study objectives**

- To assess knowledge of final year nursing students regarding the prevention of HBV infection.

- To investigate the attitudes of final year nursing students regarding prevention of HBV infection.
- To investigate the practices of final year nursing students regarding prevention of HBV infection.
- To compare the HBV knowledge, attitudes and practices among the final year nursing students in three different nursing colleges of Gauteng province.

## **1.5 JUSTIFICATION FOR DOING THE STUDY ON FINAL YEAR NURSING STUDENTS**

The final year student nurses are included in the study because they are senior students who have learnt a lot about communicable diseases including HBV in one of their subjects, namely Community Health Nursing Science. Furthermore, they have also nursed patients with medical conditions including HBV infection in the three academic hospitals of Gauteng province. Amongst all health care professionals, student nurses will be studied firstly because nurses in general form 50% of the health care providers (Burger, 2006:7), and secondly employee wellness including the prevention of occupational risks for nurses is advocated by the World Health Organization (WHO), and thirdly, if this category of health care workers (HCWs) is not taken care of, the future patients' care will be at stake.

## **1.6. DEFINITION OF TERMS**

### **1.6.1 Knowledge**

Knowledge refers to what everybody or someone knows about the subject (Augarde et al 1993:1147)

### **1.6.2 Attitudes**

Attitude refers to one's physical and emotional position and manner with respect to performance, situation and thing (HBV infection) (Kyes et al 1074:495)

### **1.6.3 Practices**

Practice is carrying on professional working practice with integration to theory (Fowler and Fowler 1999:805).

### **1.6.4 Hepatitis B virus (HBV)**

HBV is a DNA virus that is transmitted by percutaneous injuries or per mucosal exposure to infectious blood products or other body fluids (Lewis et al 2000:1193).

### **1.6.5 Health care workers (HCWs)**

HCWs refers to student nurses, medical and dental students, qualified nurses and doctors of different disciplines and dentists (Vlok. 1996:30).

## **1.7 ORGANIZATION OF THE RESEARCH REPORT**

### **1.7.1 Chapter 1**

This chapter introduces the topic and provides the background to the study. It includes the significance of studying the problem of HBV infection prevention in nursing students; the background to the study; problem statement; rationale of the study; research questions; justification for doing the study on final year nursing students; definition of terms; aim of the study; and study objectives.

### **1.7.2 Chapter 2**

This chapter reviews literature related to HCWs knowledge, attitudes and practices regarding the prevention of HBV infection. It includes the epidemiology of HBV; occupational risk in the health care setting; prevention and control of HBV in the health care setting; studies on the KAP of HCWs regarding the prevention of HBV infection.

### **1.7.3 Chapter 3**

This chapter describes the research methodology used for this study. This includes the study design, study setting and study population, study sample, data collection, data analysis plan, control of bias, reliability and validity, ethical considerations.



## **17.4 Chapter 4**

This chapter presents the results of the analysis of the data. Graphics including tables and figures are used to present the findings.

## **1.7.5 Chapter 5**

This chapter discusses the findings of this study. The limitations of the study, conclusions and recommendations based on the study are also described.

## **CHAPTER 2:**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This chapter gives a brief overview of the epidemiology of HBV. Occupational risk in the health care setting, the prevention and control of HBV infection, and finally discusses the literature on knowledge, attitudes and practices of HCWs regarding the prevention HBV infection.

The literature review has been divided into the following sections for convenience.

- Epidemiology of HBV
- Occupational risk in the health care setting
- Prevention and control of HBV in the health care setting
- Studies on the KAP of HCWs regarding the prevention of HBV infection

#### **2.2 EPIDEMIOLOGY OF HBV**

The etiological agent for the HBV was discovered in 1966 (Ocama et al 2005:16)

Hepatitis B infection is a major health problem with a characteristic geographic distribution (Halfon et al 2005:330). The major risk factors associated with HBV infection include poor sterilization technique and contact with infected blood and body fluids (Buster et al 2003:80). All health care workers in contact with blood and body fluids should know their antibody status and be vaccinated for HBV if they have not previously had HBV infection and should adhere to universal protective measures (Fry 2007:640).

##### **2.2.1 Virology of HBV**

HBV consists of an outer lipid envelope and an icosahedral nucleocapsid core composed of protein. This double stranded deoxyribonucleic acid (DNA) virus of the

hepadnaviride family is the smallest DNA virus to infect humans (Kotzee et al, 2006:39).

**Table 1.1. Serological markers and clinical significance:**

Serological marker	Clinical significance
Hepatitis B surface antigen (HBsAg) positive	Acute or chronic infection
Antibody to hepatitis B core antigen (anti-HBc) immunoglobulin M (IgM) positive, anti HBc IgG negative	Acute infection
Anti-HBc IgG and HBsAg positive	Chronic infection
Anti-HBc IgG and antibody to hepatitis B surface antigen (anti-HBs) positive	Resolved infection
Anti-HBc only positive	Exposure; low level carrier; senescence of anti-HBs; false positive; possible occult HBV infection
Anti-HBs only positive	immunity (vaccinated, or natural infection with waning anti-HBc)

(Kotzee et al 2006:40)

### 2.2.2 Prevalence of HBV

Worldwide it is estimated that 387 million people are carriers of HBV which represent over 5% of the global population (Arbuthnot and Kew 2001:78). Of these carriers, 45% reside in highly endemic HBV areas ( $\geq 8\%$  HBV carriage), which includes sub-Saharan Africa, where it is estimated that 50 million people are chronic HBV carriers, with an estimated lifetime risk of contracting HBV that is greater than 60% (Maddrey 2000:364; CDC 2004:89). Thus it is clear that sub-Saharan HCWs are at high risk for occupational exposure to HBV.

### **2.2.3 Transmission routes**

The major transmission route in sub-Saharan Africa is unexplained horizontal transmission in childhood, with the majority of the population having been exposed to HBV by the age of 5 years. Thereafter the rate increases slightly when children first attend school and again when they become sexually active. Vertical HBV transmission does not play a major role in sub-Saharan Africa, as most chronically infected mothers are not actively replicating (i.e. they are not highly infectious). Babies born to mothers who have cleared their HBV infections (i.e. who are anti-HBs positive) are protected by maternal antibodies which are effective for six months to one year after birth (Burnett et al 2005:202, Kotzee et al 2006:38). In an early study pregnant Senegalese women were given three doses of HevacB to improve passive protection of their children, however such protection was of short duration and children born to HBeAg positive children were not protected (Kiire 1996:8)

In the health care setting, the mode of transmission for HBV is most often via needle prick or sharps injuries, and poor adherence to universal precautions, lack of disinfecting work areas in the clinical laboratories, and not wearing gloves when handling all blood and body fluids. Poor maintenance of infection control measures contribute to risk of transmission (Smelzer and Bare 2003:1098).

## **2.3 OCCUPATIONAL RISK IN THE HEALTH CARE SETTING**

Exposure to blood borne pathogens remains a significant occupational hazard to all HCWs. The risk of acquiring HBV infection from occupational exposure is at least 30% from a percutaneous or mucosal exposure to blood and body fluids from a patient with acute or chronic HBV infection (Zimmerman & Middleton 2007:543). HCWs at risk include those in contact with blood and human secretions, haemodialysis staff, oncology and chemotherapy nurses, all personnel at risk of needle stick injuries, which includes those working in operating rooms and clinical laboratories, respiratory therapists, surgeons, doctors, dentists, as well as medical, dental and nursing students (Smelzer and Bare 2003:1096).

In the health care setting, the mode of transmission for HBV is most often via needle prick injuries and poor adherence to universal precautions (Smelzer and

Bare2003:1096). HBV co-infection is very common in HIV positive individuals (Burnett et al 2005: 203), and since we have such a high HIV-related bed occupancy rate in SA, it is clear that HCWs have an increased risk for exposure to HBV. If a HCW is exposed to the blood of a HIV/HBV co-infected patient, he/she is 100 times more likely to be infected with HBV than with HIV (Kotzee et al 2006:39).

## **2.4 PREVENTION AND CONTROL OF HBV INFECTIONS IN THE HEALTH CARE SETTING**

### **2.4.1 Universal precautions**

It is essential that consistent application of these measures be adhered to in any health care delivery to protect both the patient and HCW.

**Gloves:** The gloves are worn to provide a protective barrier to prevent contamination of hands when touching blood, body fluids, secretion, excretion, mucous membranes and non-intact skin. The gloves are worn to reduce the risk of exposure to blood borne pathogens, transmission of microorganism present on hands of HCW to patient. However wearing gloves does not replace the need for hand washing, since gloves may have small, unapparent defects or may be torn during use and hands can become contaminated during removal of gloves (Leighner 2001:32).

**Gowns:** They are worn to prevent contamination of clothing and to protect the skin of HCWs from blood and body fluid exposures. HCWs wear gowns during the care of patients infected with pathogenic microorganisms and where there could be splashes of human blood and body fluids. This is done to reduce the opportunity for transmission of pathogens from the patient to the environment (Leighner 2001:32).

**Shoe covers:** Leg coverings, boots or shoe covers provide greater protection to the skin when splashes or large quantities of infected material are present or anticipated (Leighner 2001:33).

**Mask, goggles and face shield:** These are worn alone or in combination to provide a barrier protection during procedures that are likely to generate splashes of blood or body fluids (Leighner 2001:34)

**Hand washing:** In addition to using barriers, hand washing is the single most effective measure to reduce transmitting microorganisms to patients or HCWs. Hands should be washed promptly and thoroughly between patient contacts and after contact with blood, body fluids, secretions, excretions, and equipments contaminated by them (Leighner 2001:35)

**Safer medical devices:** This include needless devices and not using needles where safe and effective alternatives are available, avoiding recapping needles and disposing of needles promptly in appropriate sharps disposal containers. HCWs should report potential hazards from needles and help their facility to select and evaluate safety devices. Needle stick injuries or other exposures to blood or body fluids should be reported immediately to ensure appropriate follow up (Leighner 2001:35).

**Isolation:** Contact precautions are designed to reduce the risk of transmission of pathogenic organisms. Patients' should be placed in private rooms or room with a patient who has active infection with the same microorganism. HCWs should wear clean gowns, gloves, and masks, and equipment used should be thoroughly cleaned and disinfected before used on another patient (Leighner 2001:37).

#### **2.4.2 Post-exposure prophylaxis**

Following exposure to potentially HBV-infected body fluids, the exposed part of the body should immediately be washed with water and soap. The source patient must be tested for HBsAg, and if the HBV status of the HCW is unknown, the HCW should be tested for both HBsAg and anti-HBs (Preboth 2002:2001).

If the exposed HCW is found to be anti-HBs negative, he / she should be given hepatitis B immunoglobulin G (HBIG), followed by initiation of the HBV vaccine series for both unvaccinated HCWs and HCWs who are vaccinated but are non-responders (Kotzee 2006:40).

**2.4.3 Hepatitis B vaccination:** The most efficient method of preventing several hospital-acquired infections such as HBV is through pre-exposure immunization.

In 1981, the first hepatitis B vaccine was produced. It was derived from donated human blood plasma (known as 'Plasma-Derived Vaccine' or PDV). In 1986 the PDV

was approved for human, but has been largely superseded by the yeast derived re-combinant vaccines such as Engerix, which contain HBsAg only.

All of these vaccines have proved highly efficacious, and most vaccinated individuals remain protected against HBV for at least twenty years (Kotzee 2006:41). Although some individuals may lose protective anti HBs (i.e. titres equal or greater than 10mIU/ml) over time, they remain protected from the disease by the immunologic memory cells of the immune system which produce an anamnestic response upon exposure (Kotzee 2006:42).

In 1991, the World Health Organization (WHO) recommended that the HBV vaccine should be introduced into the Expanded Program on Immunization (EPI) and this has been achieved in SA since April 1995. The HBV vaccine is given at six, ten and fourteen weeks, this prevents the infants from becoming infected with HBV, thereby bringing down the HBV carriage rate of SA (DOH 2005:3).

The Gauteng Department of Health has recently published a circular advocating 3 doses of free hepatitis B vaccine to be given to all HCWs (DOH, 2005:3). However, anecdotal evidence points to this not being practiced due to lack of resources, which includes nurses to administer the vaccine and funds for the vaccine itself. However, in UK and Israel there is wide implementation and uptake of this vaccine, and in Germany, medical universities offer free HBV vaccine to all medical students (Moore, 2003:5; Delsenhammer et al 2006:265; Kagan et al 2008:581).

## **2.5 STUDIES ON THE KAP OF HCWs REGARDING THE PREVENTION OF HBV INFECTION**

### **2.5.1 Knowledge about and attitudes towards occupational risk**

Studies on nurses in the USA, Australia and Pakistan, among middle and high grade medical doctors and surgeons in China and Iran, found that knowledge about transmission of HBV is low (Knight and Bodsworth 1998:747; Alam 2002:85; Samayoa et al 2006:51; Delsehammer et al 2006:266; Yang et al 2006:414; Irfan 2008:5; Moghimi et al 2008:3). However, the Saudi Arabia study found that nurses and paramedical staff were more knowledgeable than student doctors regarding the fact that needle stick injuries can transmit HBV (Alam 2002:87). Different findings

were identified among nurses working in high risk and dental areas, dental and young medical students on their understanding in aetiology of HBV infection and infectivity (Adebamowo et al 1998:529; MacGrane and Stein 2003:349; Hu et al 2004:589; Ciesla et al 2006:28; Yang et al 2006:414; Kagan et al 2008:585).

Studies in Australia and Poland found that good knowledge of occupational risk reduces the risk of occupational exposure (Knight and Bodsworth 1998:747; Ciesla et al 2006:27). More training camps, formulation of rules and standing orders, outlining of precautionary measures, conducting of educational talks to enhance protective measures was also realised in Saudi Arabia, China and Iran and as a solution to preventing occupational risk (Alam, 2002:3; Yang et al 2006:414; Moghimi et al 2008:1). Study in South Africa support the view that good knowledge is associated with confidence in adoption of safe practise among HCWs (Yassi et al 2009:366). Thus poor knowledge about occupational risk is associated with increased occupational risk (Muawia et al 2000:219; Delsenhammer et al 2006:265; Samayoa et al 2006:51). This is also supported by the findings from Canada and US, that poor knowledge and poor adherence in senior doctors is also related to resistance to change and misconception (Patterson, 1998:687; St Germaine et al 2002:144).

### **2.5.2 KAP regarding universal precautions**

Universal precautions in the health care setting include correct usage and disposal of disposable syringes, needles and lancets, and introduction of needle less intravenous infusion administration systems, disinfecting work areas and wearing of gloves and protective clothes (Smelzer and Bare 2003:1098).

Studies in Saudi Arabia and UK found that knowledge and practices' regarding the wearing of gloves during drip insertion and blood taking was very low amongst nurses and doctors (Alam, 2002:85; Stein et al 2006:70). In the UK study, it was found that doctors perceived washing of hands before these procedures as a waste of time, unlike their counter parts meaning, the nurses (Stein et al 2006:70). Similarly, a study from Australia reported that dermatologists do not wash their hands before putting on gloves (Ong et al 1999:85). This finding supports those of studies in USA, Nigeria, Iran, France and China which found that nurses, midwives and doctors did not always use universal precautions when caring for patients (Adebamowo et al



1998:529; Curran, 2008:346; Yang et al 2006:413; Moghimi et al 2008:3; Tarantola et al 2006:378; Yang et al 2007:413). Other studies from the US, Canada and Iran, found that senior doctors do not put on double gloves at all when attending to patients (Patterson, 1998:268; St Germaine et al 2002:144; Moghimi et al 2008:3). Similar behaviour was identified among senior HCWs in South Africa who recap the needles (Yassi et al 2009:364).

Some of the studies in Australia, Kuwait and South Africa report that most health professionals adhere to universal precautions by wearing and changing gloves (Ong et al 1999:85; Muawia et al 2002:219; De Villers et al 2007:14). These findings are supported by a study from China and Australia, in which student nurses improved in the application of universal precautions after receiving training (Wang et al 2003:191; Knight and Bodsworth 2003:748). An Italian study found that the HCWs had been careless at times as they did not bother to read guidelines on prevention of infection. Their attitudes and practices improved after being exposed to educational an programme on infection control (Di Giuseppe et al 2006:1673). It is reported that in France and Canada some of the nurses and doctors put on double gloves only when they are performing certain procedures (Tarantola et al 2006:378; St Germaine et al 2002:144). In South African study HCWs were not sure on when to use sterile/unsterile gloves, gowns and aprons (Yassi et al 2009:362).

### **2.5.3 KAP regarding post-exposure prophylaxis (PEP)**

Studies that were conducted in China and Poland state that there is less reporting and monitoring of exposure to human secretions from the nurses, paramedical staff and medical students despite their understanding of the need for HBV PEP (Wang et al 2003:192; Andrzej et al 2006:28). This finding differs from studies that were conducted in the USA and Australia, in which it was found that medical students are more likely to report exposure than the permanent staff (Knight and Bodsworth 1998:748; Curran, 2000:346).

In Spain, it is reported that permanent staff did not report the incidence of exposure to body fluid as they perceive that reporting of exposure to body fluid and receiving PEP are not important (McEwen and Farren 2000:233). The perceptions of student nurses regarding this issue should be investigated as studies in the USA, Saudi Arabia,

Australia and Germany and Iran report that knowledge about post exposure testing and antibody level testing is lacking among nurses, and they do not take PEP as they are unfamiliar with the latest treatment, and believe that they are immune to HBV and that exposure does not constitute a risk to their health (Knight and Bodsworth 1998:748; Alam, 2002: 43; Samayoa et al 2006:51; Delsenhammer et al 2006:266; Moghimi, 2008:4).

#### **2.5.4 KAP regarding hepatitis B vaccination**

A report from the USA on HCW's attitudes towards vaccination found that they are reluctant to be vaccinated as they fear plasma derived vaccine as it contains attenuated HBV virus (Twitchell, 2003:40). However many studies have found a positive correlation between increased knowledge and uptake of HBV vaccination. For example, studies in Nigeria, Spain, and Taiwan found that most vaccinated nurses and dental students acquired knowledge of HBV from their nursing degree and from working in high risk areas that expose them to HBV (Adebamowo et al 1998:530; Lee 200:94; Hu et al 2004:592). Contrary to these findings, a study that was conducted in the UK on nurses reports that nurses did not finish their vaccination schedule despite having studied a course on vaccination, and midwives who were not immunized showed lack of awareness of the existence of the vaccine (Lee 2009:94). In a study that was conducted in Saudi Arabia, low immunization uptake was identified among dental staff despite their knowledge and availability of the vaccine (Paul et al 1999:84). While in South Africa it is reported that medical and nursing students accepted HBV vaccination despite their lack of knowledge about its effectiveness (Stein et al 2006:71).

Finally, studies in Iran, US and Germany found that younger and newly qualified doctors are more likely to be vaccinated than older and more experienced doctors (Patterson 1998:687; Delsenhammer et al 2006:266).

A study in Ireland on attitudes and practices towards vaccination found that individual responsibility, obtaining knowledge from occupational health physicians or nurses, and caring for clients with HBV infection, influence vaccination uptake among nurses (McGrane and Staines 2003:351). Studies conducted in Iran and Egypt found high uptake of free vaccine among young surgeons (Allam et al 2003: 375; Moghini et al

2007:4). ). In Sweden despite the availability of free vaccine seventy six percent HCWs were not vaccinated, they either forgot or never made appointment for vaccination (Dannetun et al 2006:203). Study in Nigeria found that only twelve percent of the unvaccinated respondents could not afford the vaccine (Adebamowo et al 1998:30).

## **CHAPTER 3: STUDY METHODS**

### **3.1 INTRODUCTION**

This chapter deals with the research methods used in this study to survey the knowledge, attitudes and practices of final year nursing students in three different nursing colleges of Gauteng province, regarding the prevention of HBV infection.

### **3.2 STUDY DESIGN**

This was a descriptive, quantitative cross-sectional study which used a standardized, structured self-administered questionnaire to survey knowledge, attitudes and practices of student nurses regarding prevention of HBV infection.

### **3.3 STUDY SETTING AND STUDY POPULATION**

There are four nursing colleges in Gauteng Province that offer general basic training. These are government-run colleges offering general basic training for a four year Diploma in Nursing (General, Psychiatric and Community) and midwifery which is accepted by SA universities for post basic training. The other nursing colleges in the province are privately run. The four colleges are: S.G Lourens Nursing College in the city of Tshwane; SAMS Nursing College in Centurion; Ann Lansky Nursing College in the city of Johannesburg; and Baragwanath Nursing College in Soweto. SAMS College, the smallest of the 4 with 500 students in all 4 years, was used for piloting the study, and the study was conducted in the other 3 colleges, which have about 1000 students each in all 4 years. The three colleges were selected because they are the only colleges training nurses for a four years diploma.

The study population was the all final year student nurses training for a four year Diploma in Nursing (General, Psychiatric, Community health) and midwifery nursing science.

#### **3.3.1 Study Sample**

Sampling was not feasible in such a small target population, as this would have limited the generalizability of the findings. Thus questionnaires were distributed for self-administration to all final year students in the three colleges.

### **3.4 DATA COLLECTION.**

#### **3.4.1 The questionnaire (See Appendix A)**

The questionnaire was self generated and adapted from the literature (Barbie and Mouton 2004:233).

It was self-administered, and consisted of twenty seven standardized questions divided into three sections:

Section A of the questionnaire covered questions on demographics of respondents

Section B of the questionnaire contained questions to evaluate knowledge of respondents.

Section C of the questionnaire contained questions on practices of the respondents.

Section D of the questionnaire contained questions to evaluate attitudes of respondents.

#### **3.4.2. Data collection strategy**

Before questionnaires were handed out to participants, the aims and objectives of the study was explained to them, and they were informed that, if they do not want to take part in the study they do not have to, and that the non-participation will have no bearing on their academic grades since questionnaires are anonymous.

Questionnaires were handed out to a group of final year student nurses during their block period (classroom sessions) and completed under the supervision of the researcher so that they don't consult each other, go on to the internet, or visit the library. The researcher ensured that on that day when questionnaires were administered there is no community health nursing science and general nursing science periods as these could encourage students to refer to the literature for some of the knowledge answers.

### **3.5 DATA ANALYSIS PLAN**

Upon completion of data collection, data were coded, captured on Excel and then imported into the statistical Package for Social Sciences (SPSS) version 14.0 for analysis. Descriptive statistics were used mainly to summarize the data and provide answers to the first three research objectives, whereas, the independent sample t-tests and one-way ANOVA tests and post hoc Tukey's HSD test were used to identify significant differences for the last research objective. These analyses included the comparisons of final year nursing students' knowledge, attitudes and practices by demographic characteristics.

### **3.6 CONTROL OF BIAS**

The study was not prone to selection bias as the study was aimed at the total population and participant has to be volunteers. Furthermore bias was prevented by making the study anonymous to encourage participation. Also, administering the questionnaire during class time so that students will not have to use up their leisure time, and explaining the importance of the study to the students, had increased the response rate. Also, the error introduced by this bias was limited by the inclusion of all final year student nurses in three Gauteng Province nursing colleges training for a four year nursing diploma.

### **3.7 RELIABILITY AND VALIDITY**

#### **3.7.1 Piloting to ensure validity**

Piloting of the questionnaire was done on ten volunteer final year students from SAMS College, because they were not included in the study, and this was done only after approval by MREC. Data collection proceeded as described for the main study.

Analysis of the data collected revealed the following: completion of the questionnaire took the participants forty minutes. The time was in line with the proposed one by the researcher. The questions were all clearly understood and no changes were made to

the questionnaire. The researcher had to clarify the issue of free testing for HBV, and whether the lab results would be made known to them.

### **3.7.2 Double data capture to ensure reliability**

Upon completion of data collection, data were coded and entered into the statistical Package for social sciences version 14.0 for analysis. The data was entered twice and analysis of the data was done twice, this was done to compare the findings to exclude any differences. The findings were identical.

## **3.8 ETHICAL CONSIDERATIONS**

Ethical considerations included:

Approval from the Medusa Research Ethics Committee (MREC) of the University of Limpopo Faculty Of Health Sciences was obtained before conducting this study. See Appendix B for the clearance certificate.

The permission to conduct the study was also sought from the Director of the Gauteng Department of Health Research Committee and authorities in charge of the nursing colleges and their research committees both issued letters of permission. See Appendix B

Autonomy was insured by explaining the aims and objectives of the study to the students beforehand, and informing them that if they do not want to take part in the study they do not have to, and that this non-participation will have no bearing on their grades. Confidentiality was ensured since the participants were anonymous. A statement was included at the top of the questionnaire, requesting students to not include identifiers, and that by completing the questionnaire and handing it in, they are consenting to take part in the study (see Annexure A).

Students who wished to know their HBV status were offered a free HBV test, for which informed consent was obtained (see Annexure B). A blood sample (5ml clotted) was collected from each consenting participant by the researcher who is a qualified phlebotomist. In these cases, the participant's identity was revealed in order for the results of their HBV test to be given to them.

The results from the HBV test were given to each participant individually by the researcher, and in cases where the participant is not protected against HBV, or is identified as a chronic HBV carrier, the researcher counselled these students appropriately.

In order to protect the identity of each college, they are not named in the results section, and are referred to simply as Colleges A, B, and C



## **CHAPTER 4: DATA ANALYSIS AND RESULTS**

### **4.1 Introduction**

The findings of this study are reported in this chapter and described in the following sequence: First; a description of the response rate and preliminary analyses are presented. Second; a description of the nursing students on selected demographic characteristics is given

### **4.2 Response rate**

A total of 350 questionnaires were handed out: 200 at College A (*North of Gauteng*); 100 at College B (*South East of Gauteng*) and 50 at College C (*Central Gauteng*). A total of 312 questionnaires were returned: 188 from College A; 92 from College B and 32 from College C. This gives an overall response rate of 89.14% (312/350), with the response rates from each college being 94% (188/200) for College A; 92% (92/100) for College B and 64% (32/50) for College C.

### **4.3 Preliminary Analysis**

Before addressing the primary objectives of this study, several preliminary analyses were conducted, which includes proportions of missing values and item distributions. This analysis was undertaken by means of response frequencies to investigate the extent of data anomalies and the probable ambiguity that these might introduce into the inferences that can be drawn from study. The results of this analysis revealed that:

First, in one of the questionnaires, approximately 65% of items were not answered (item non-response). A decision was made to discard the case/respondent in subsequent data analyses. This resulted in 311 questionnaires that were usable.

Second, major discrepancies were found in the attitude items (i.e., Section D; items 24, 25, 26 and 27) the numbering given in the instruction for answering to these items did not correspond with the numbering of the items themselves (The instruction was: “*Please complete 27, 28 and 29 only if you have not received hepatitis B vaccine*” – However items 28 and 29 did not exist in the questionnaire). This problem could not be addressed or resolved since the data had been collected. Nonetheless, it was

decided to utilize all items in Section D, including item 18 in Section C, to explore attitudes of respondents who have never received hepatitis B vaccination.

These respondents amounted to 37.3% (116/311) of the total sample.

#### 4.4 Characteristics of the Sample

This section discusses the demographic data that include gender and age. Results in Table 4.1 indicate that, overall, a considerable number of respondents (86.8%, 270/311) were females, compared to only 13.2% (41/311) of male respondents. Regarding age, in Table 4.2, the majority of respondents (59.6%, 184/309) were below 31 years of age.

Table: 4.1 Gender frequency distribution

Gender	Frequency	Percent
Male	41	13.2
Female	270	86.8
Total	311	100

Table: 4.2 Age frequency distribution

Age (yrs)	Frequency	Percent
21 – 25yrs	91	29.4
26 – 30yrs	93	30.1
31 – 35yrs	53	17.2
36 – 40yrs	30	9.7
41 – 45yrs	16	5.2
46+yrs	26	8.4
Total	309	100.0
Overall	311	

Table 4.3 Distribution by age, gender and colleges

Demographic Characteristics	Male		Female		Total	
	N	(%)	N	(%)	N	(%)
Age (yrs)						
21 – 25yrs	12	(3.9)	79	(25.6)	91	(29.4)
26 – 30yrs	11	(3.6)	82	(26.5)	93	(30.1)
31 – 35yrs	11	(3.6)	42	(13.6)	53	(17.2)
36 – 40yrs	5	(1.6)	25	(8.1)	30	(9.7)
41 – 45yrs	2	(.6)	14	(4.5)	16	(5.2)
46+yrs	(-)	(-)	26	(8.4)	26	(8.4)
College						
College A	22	(7.1)	165	(53.1)	187	(60.1)
College B	6	(1.9)	86	(27.7)	92	(29.6)
College C	13	(4.2)	19	(6.1)	32	(10.3)

#### 4.5 Description of Final Year Nursing Students' Knowledge about prevention of HBV

The first research objective in this study was: 'To assess knowledge of final year nursing students regarding prevention of HBC infection'. The distribution of correct/incorrect answers by knowledge questions is presented in Table 4.4. The results indicate that 6 out of 7 items were answered correctly by more than half of the respondents. The vast majority knew that hepatitis B can be spread through contact with open wounds/cuts (95.8%) or people who are carriers of hepatitis B are at risk of infecting others (93.9%). However, only 15.8% of the respondents indicated that the hepatitis B vaccine is made from human blood.

Seven items comprised the Knowledge index from which a composite score was obtained. This index measured the number of correct responses on general knowledge questions regarding HBV infection and prevention. The potential range of scores was 0 to 7. The correct answers (actual scores) ranged from 1 to 6 with a mean score of 4.54 ( $SD = 0.92$ ). The median and mode of correct answers were both 5.00. Also it was found that 87.6% had scored four or more indicating overall knowledge of the participants regarding HBV was quite good.

**Table 4.4 Knowledge Items Frequency Distribution (n=311)**

Question	Responses		
	Correct Scored 1	Incorrect Scored 0	Don't know Scored 0
	n (%)	N (%)	n (%)
Can HBV be caught through casual contact such as holding of hands?	No 160 (51.4)	Yes 112 (36.0)	27 (8.7)
People who are carriers of HBV are at risk of infecting others	Yes 292 (93.9)	No 8 (2.6)	8 (2.6)
The hepatitis B vaccine is made from human blood	Yes 49 (15.8)	No 71 (22.8)	171 (55.0)
Can HBV be spread through contact with open wounds/cuts?	Yes 298 (95.8)	No 5 (1.6)	6 (1.9)
Can HBV cause liver cancer?	Yes 257 (82.6)	No 10 (3.2)	41 (13.2)
Can the hepatitis B vaccine cause mild side effects?	Yes 234 (75.2)	No 33 (10.6)	39 (12.5)
Can the hepatitis B vaccine be effective in protecting against HBV?	Yes 277 (89.1)	No 9 (2.9)	18 (5.8)
Overall Mean Score (SD)	4.54 (0.92)		

*Note.* Rows where the numbers do not add up to the specified N reflect missing values for that row.

#### **4.6 Description of Final Year Nursing Students' Attitudes**

The second research objective in this study was 'To investigate the attitudes of final year nursing students regarding the prevention of HBV infection'. As indicated in section 4.2 above, results in this section apply only to respondents who had never received Hepatitis B vaccination. A point value from -1 to +1 was assigned for each response choice: -1 being 'Agree', 0 for 'Not sure' and +1 for 'Disagree'. The potential range of scores was -4 (minimum) to +4 (maximum). A score closer to +4 suggests favourable attitudes while a score closer to -4 represent the least desirable

attitudes. All but one of the five items was negatively stated. The positive item was reverse-scored and a summated scale was formed by adding each student's responses across items. Actual scores ranged from -2 to +4 with a mean of 1.224 ( $SD = 1.52$ ). The median and mode were both 1.0. The frequency distribution of attitude scores is provided in Table 4.5. 66% of the respondents had scores between +1 and +5 indicating that they disagreed with the statements. An item-by-item review of frequencies and percentages of the four attitudinal statements is provided in Table 4.6. Overall respondents had fairly low positive attitude towards accepting HBV.

Table: 4.5 Total attitude score distribution of the students

Total Score	Frequency	Percent
-2	2	2.1
-1	12	12.4
0	19	19.6
1	22	22.7
2	21	21.6
3	14	14.4
4	7	7.2
Total	97	100.0

Table 4.6: Attitude frequency distribution

Statement	Agree Scored (-1)	Disagree Scored (1)	Not Sure
	n (%)	n (%)	n (%)
I am not at risk for getting HBV	3 (3.6)	58 (69)	23 (27.4)
I do not believe that the hepatitis B vaccine is safe	26 (31.3)	40 (48.2)	17 (20.5)
I think the hepatitis B vaccine costs too much	21 (24.7)	13 (15.3)	51 (60)
Changing gloves during glucose testing wastes time	15 (16.5)	72 (79.1)	4 (4.4)

## **4.7 Description of Final Year Nursing Students' Practices**

Objective three was “To investigate the practices of final year nursing students regarding prevention of HBV infection”. For the purposes of analysis, practice items have been divided into subsections which address the following issues: a) Compliance with universal precautions, b) vaccination against HBV, and c) occupational exposure.

### **4.7.1 Compliance with universal precautions**

Five questions were used to compile a ‘Compliance’ index in order to determine the extent to which students’ actions were in compliance with proper procedure. Responses were recorded using a five-point Likert type scale wherein: 1 = Never; 2 = Not sure; 3 = Sometimes; 4 = usually; and 5 = Always. The maximum possible score for these items was 25; indicating acceptable level of compliance, and the minimum possible score was 0. Scores were calculated by summing the ratings assigned to the students’ responses. Actual scores ranged from 5 to 23 with a mean of 14.03 ( $SD = 3.35$ ). The median and mode were both 14. The frequency distribution of compliance scores is provided in Table 4.6. Majority (79%) had total score between 12 and 23 indicating students were good compliance with UP, and the frequency and percentage of compliance items are shown in Table 4.7.

### **4.7.2 Vaccination against HBV**

Among the vaccinated, 88.6% (179/202) were females and 11.4% (23/202) were males. The majority of females (62.9% [179/270]) and males (56% [23/41]) were vaccinated. The majority of College A students (90.9% [170/187]) were vaccinated, followed by College B, (29.3% [27/92]), and College C (15.6% [5/32]). The overall vaccination rate was 64.9% (202/311).

### **4.7.3 Occupational exposures**

The occupational exposure as part of practices was investigated among the students. The findings are tabulated in table 4.10. The investigation was done in regard to gender and colleges. The majority of those exposed were females (88.7% [86/97]), and 31.9% (86/270) of females were exposed, compared to 26.8% (11/41) of males.

**Table 4.7: Total score distribution of UP compliance of the respondents**

Total Score	Frequency	Valid Percent
5.00	2	.6
6.00	1	.3
7.00	4	1.3
8.00	7	2.3
9.00	19	6.1
10.00	14	4.5
11.00	18	5.8
12.00	26	8.4
13.00	38	12.3
14.00	54	17.4
15.00	32	10.3
16.00	32	10.3
17.00	18	5.8
18.00	15	4.8
19.00	7	2.3
20.00	14	4.5
21.00	5	1.6
22.00	1	.3
23.00	3	1.0
Total	310	100.0

**Table 4.8 Compliance Items Frequency Distribution (n =311)**

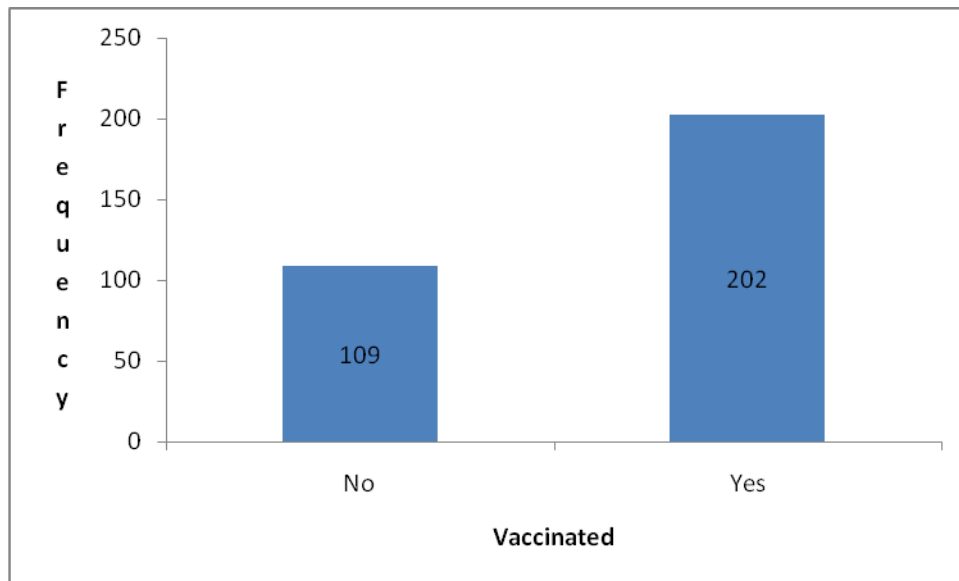
Practice	Always	Usually	Sometimes	Never	Not
	n (%)	n (%)	n (%)	n (%)	N (%)
I get time to wear protective clothes when a woman is fully dilated and about to deliver	124 (39.9)	77 (24.8)	99 (31.8)	9 (2.9)	1 (.3)
I wear gloves during preparation for delivery of a newborn	20 (9.9)	2 (2.5)	37 (18.5)	139 (68.8)	1 (0.5)
I change gloves for each patient during blood taking	212 (68.2)	31 (10.0)	56 (18.0)	9 (2.9)	2 (.6)
I change gloves for each patient during glucose test	99 (31.8)	42 (13.5)	102 (32.8)	65 (20.9)	-
I report needle stick injuries	42 (43.8)	15 (15.6)	15 (11.6)	22 (22.9)	2 (2.1)

*Note. Rows where the numbers do not add up to the specified n reflect missing values for that row.*

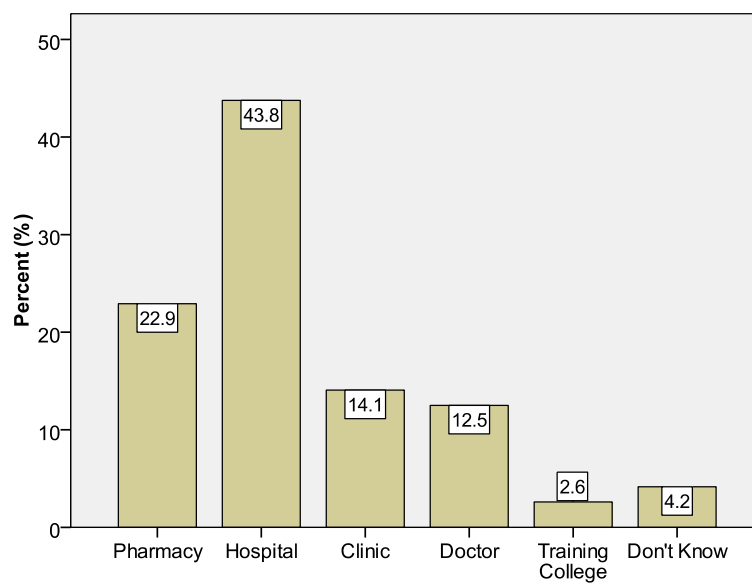
**Table 4.9 Gender, college, vaccinated cross tabulation**

Vaccinated			College			Total
			College A	College B	College C	
Gender	Female	Count	151	25	3	179
		% within College	88.8%	92.6%	60.0%	88.6%
	Male	Count	19	2	2	23
		% within College	11.2%	7.4%	40.0%	11.4%
Total		Count	170	27	5	202
		% within Gender	90.9%	29.3%	15.6%	64.9%

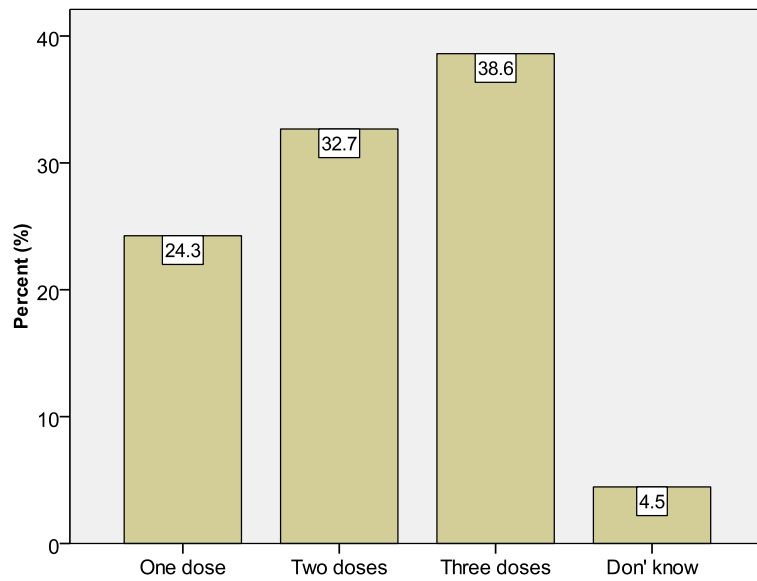




**Figure 4.1**  
**Have you ever received a Hepatitis B vaccine before?**



**Figure 4.2**  
**The facility where hepatitis B vaccine was received**



**Figure 4.3**  
**Number of doses of Hepatitis B vaccine**

**Table 4.10: Gender \* College \* Ever had needle prick injury Crosstabulation**

Ever had needle prick injury			College			Total
			College A	College B	College C	
Gender	Female	Count	54	27	5	86
		% within	91.5%	90.0%	62.5%	88.7%
	Male	Count	5	3	3	1
		% within	8.5%	10.0%	37.5%	11.3%
Total	Count	59	30	8	97	
	% within	60.8%	30.9%	8.2%	100.0%	

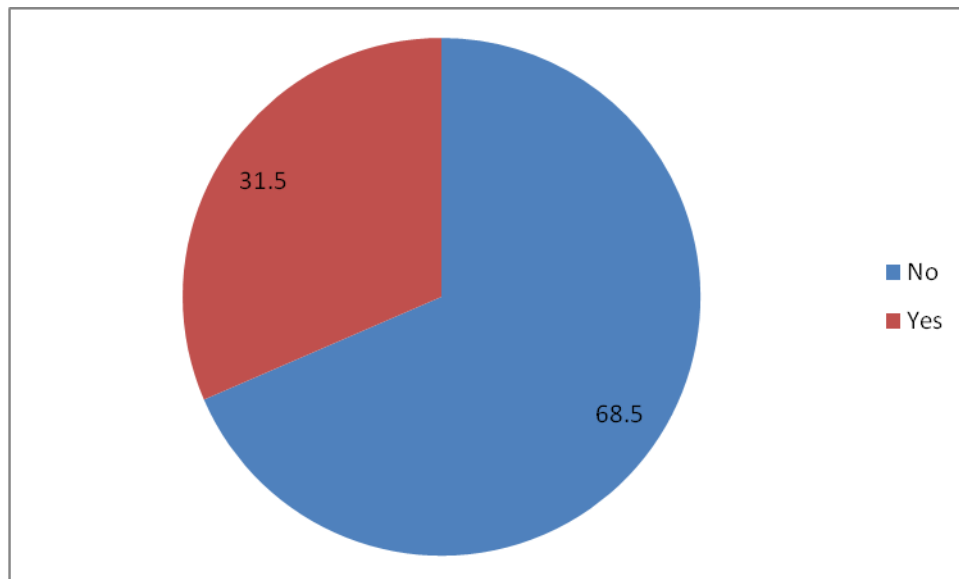


Figure: 4.4 Exposure to needle prick injuries

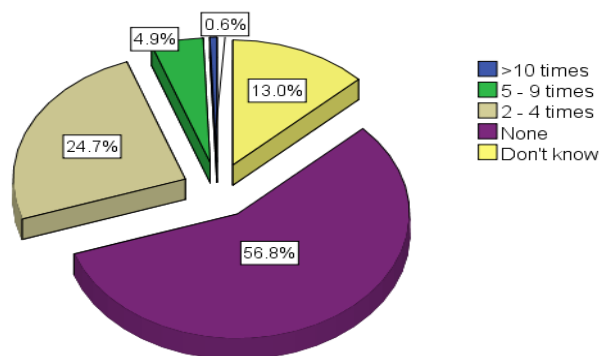


Figure 4.5 Exposure to blood / body fluid splashes

#### 4.8 Group Differences in Knowledge, Attitudes and Practices among Final Year Nursing Students

Objective four sought to compare the final year nursing students' knowledge, attitudes and practices concerning the prevention of HBV infection. The following analyses compare the variables according to the students' demographic characteristics and college attended.

#### 4.8.1 Knowledge

Results from an independent sample *t*-test and one-way ANOVA tests indicated significant mean difference for knowledge ( $F(2,307)=12.254, p<0.001$ ) with regard to college enrollment. The post hoc Tukey's HSD test was conducted to determine which colleges were significantly different. Results revealed that students from college A and college C differed significantly from one another with regard to their knowledge levels ( $p<0.001$ ).

Table 4.11 Descriptive statistics for knowledge score

	Colleges	N	Mean	Std. Deviation	Std. Error
Total Knowledge Score	College A	186	4.7097	.83931	.06154
	College B	92	4.3913	.83806	.08737
	College C	32	3.9688	1.25684	.22218
	Total	310	4.5387	.91912	.05220

Table 4. 12: ANOVA test for knowledge score

		Sum of Squares	df	Mean Square	F	Sig.
Total Knowledge Score	Between Groups	17.831	2	8.916	11.254	.000
	Within Groups	243.204	307	.792		
	Total	261.035	309			

Table 4.13: Post hoc Tukey's HSD test for knowledge score

Dependent Variable	(I) College	(J) College	Mean Difference (I-J)	Std. Error	Sig.
Total Knowledge Score	College A	College B	.31837 <sup>*</sup>	.11345	.015
		College C	.74093 <sup>*</sup>	.17034	.000
	College B	College A	-.31837 <sup>*</sup>	.11345	.015
		College C	.42255	.18267	.055

#### 4.8.2 Attitudes

The highest overall mean scores for attitude obtained by College A students (mean = 2.50,  $SD=1.41$ ) followed by college B ( $M=0.97$ ,  $SD=1.39$ ) and College C ( $M=0.90$ ,  $SD=1.60$ ). An independent samples  $t$ -test and one-way ANOVA tests were used to compare the attitude scores of students who had never tested for HBV, by college enrolment. As shown in Table, there were significantly different mean score for attitude were found among colleges ( $F(2,94)=7.867$ ,  $p=0.001$ ). The post hoc Tukey's HSD test was conducted to determine which colleges' scores were significantly different. Results revealed that students from college A had significantly higher score compared to college B students ( $p=0.001$ ) as well as college C students ( $p=0.017$ ).

Table 4.14: ANOVA test for attitude score

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Total Score for Attitude	Between Groups	31.610	2	15.805	7.867	.001
	Within Groups	188.844	94	2.009		
	Total	220.454	96			

Table 4.15: Post hoc Tukey's HSD test for attitude score

Dependent Variable	(I) College	(J) College	Mean Difference (I-J)	Std. Error	Sig.
Total Score for Attitude	College A	College B	1.528 <sup>*</sup>	.392	.001
		College C	1.600 <sup>*</sup>	.571	.017
	College B	College A	-1.528 <sup>*</sup>	.392	.001
		College C	.072	.479	.988

#### 4.8.3 Practices

The highest overall mean scores for compliance was obtained by College A students ( $M=14.72$ ,  $SD=3.28$ ) followed by college B ( $M=13.48$ ,  $SD=3.02$ ) and College C ( $M=11.53$ ,  $SD=3.29$ ). An independent samples  $t$ -test and one-way ANOVA tests were used to compare the compliance scores of students by college enrolment .as shown in Table 4.16, there were significantly different mean score for compliance found among

colleges ( $F(2,307)=15.33$ ,  $p<0.001$ ). The post hoc Tukey's HSD test was conducted to determine which colleges scores were significantly different. Results showed that students from college A had significantly higher score compared to college B students ( $p=0.008$ ) as well as college C students ( $p<0.001$ ). Also college B students had higher compliance score than college C ( $p=0.009$ )

\

Table 4.16: Descriptive statistics for UP score

	Colleges	N	Mean	Std. Deviation	Std. Error
<b>Total Score for UP</b>	College A	187	14.7166	3.27583	.23955
	College B	91	13.4835	3.02347	.31695
	College C	32	11.5313	3.29207	.58196
	Total	310	14.0258	3.35099	.19032

Table 4.17: ANOVA test for UP score

		Sum of Squares	df	Mean Square	F	Sig.
Total Score for UP	Between Groups	315.121	2	157.560	15.333	.000
	Within Groups	3154.673	307	10.276		
	Total	3469.794	309			

Table 4.18: Post hoc Tukey's HSD test for UP score

Dependent Variable	(I) College	(J) College	Mean Difference (I-J)	Std. Error	Sig.
Total Score for UP	College A	College B	1.23306 <sup>*</sup>	.40972	.008
		College C	3.18533 <sup>*</sup>	.61325	.000
	College B	College A	-1.23306 <sup>*</sup>	.40972	.008
		College C	1.95227 <sup>*</sup>	.65882	.009

#### 4.8.4 Vaccination:

Chi-square test of association was applied to find out association between student being vaccinated and their colleges. Result showed that students being vaccinated were significantly associated with their institutions ( $\chi^2=140.78$ ,  $p<0.001$ ). Backward stepwise binary logistic regression method was used to find the significant predictor for taking HBV. We found that students from college A were 57 times more likely to do HBV compare to college C (OR=57.37,  $p<0.001$ ). Knowledge score and practice scores were not significant predictor for HBV.

Table 4. 19: Cross-tabulation between College and Vaccinated

Colleges	Vaccinated		Test statistic
	No	Yes	
College A	17	170	$\chi^2=140.78$ , $p<0.001$
College B	65	27	
College C	27	5	

Table 4.20: Stepwise binary logistic regression output

Variables in the Equation									
	Variables	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 3 <sup>a</sup>	College			104.580	2	.000			
	College(1)	4.050	.553	53.694	1	.000	57.375	19.423	169.487
	College(2)	.823	.538	2.340	1	.126	2.278	.793	6.542
	Constant	-1.686	.487	11.998	1	.001	.185		

a. Variable(s) entered on step 1: College (college C as reference group), knowledge score, practice score.

#### 4.8.5 Occupational exposure:

Chi-square test of association was applied to find out association between number of time being exposed and different. Result showed that number of time being exposed to occupational hazard were significantly associated with institutions ( $\chi^2=13.78$ ,  $p=0.034$ ).

Table 4.21: Cross-tabulation between number of times exposed and colleges

No of times exposed		College			Test statistic
		College A	College B	College C	
10 times or more		0	2	0	$\chi^2=13.78$ , p=0.034
5- 9 times		8	7	0	
1 - 4 times		67	40	9	
None		111	41	23	
College	Exposed			Test statistic	
	No	Yes			
College A	111	75		$\chi^2=8.230$ , p=0.016	
College B	41	49			
College C	23	9			

Table 4.22: Logistic regression output for exposure

Variables	B	df	p value	OR	95% C.I. for OR	
					Lower	Upper
College		2	.018			
College A	.546	1	.194	1.727	.757	3.938
College B	1.117	1	.012	3.054	1.273	7.328
Constant	-.938	1	.017	.391		

Variable(s) entered on step 1: College (College C as reference group)



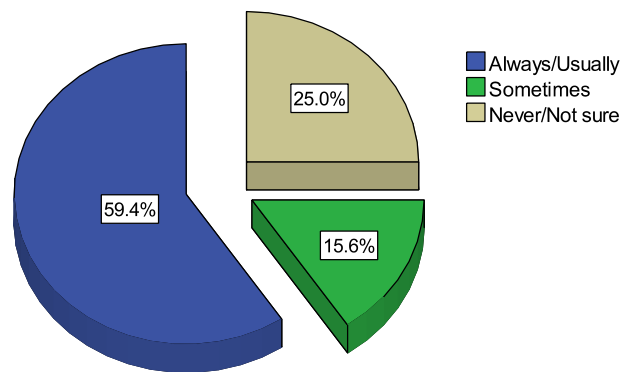


Figure 4.6  
**Reporting needle prick injuries**

## **CHAPTER 5: DISCUSSION, RECOMMENDATIONS AND CONCLUSION**

### **5.1 INTRODUCTION**

Chapter 5 discusses the findings as reported in chapter 4. The conclusion and recommendations are also discussed in this section.

### **5.2 RESPONSE RATE**

The response rate of the final year nursing students was similar to the other study findings. There is a significant difference in the response rate between the three colleges. College A and B had very good response rates of 94% (188/200) and 92% (92/100), while College C had fair response rate of 64% (32/50). Because of the good respondents at the two colleges the data obtained represent what is actually happening among the final year nursing students at Gauteng nursing colleges.

### **5.3 DEMOGRAPHIC DATA**

The study population had similar demographics to most other KAP studies (Knight and Bodsworth 2001:748; Alam 2002:387; Stein et al 2003:70; Moghimi et al 2008:3).

### **5.4 FINAL YEAR NURSING STUDENTS' KNOWLEDGE ABOUT PREVENTION OF HBV**

The results of this study showed that an overall of 87% students had indicated good knowledge regarding prevention of hepatitis B infection.

It is surprising to find out that only half 51% of the students know that HBV can be caught through casual contact and 8.7% did know that holding hands is not a mode of HBV transmission.

The vast majority (95.8% of the students knew that hepatitis B can be spread through contact with open wounds/cut. And that (93.9%) carries of HBV are at risk of infecting others. Similar study findings in Brazil showed that 80% of students had knowledge about prevention of HBV (Manso et al 2003:432) and this is actually expected from the students in the study because they have learnt about communicable diseases during their theory and practical learning experience in their third year of training and were evaluated on the same content as per curriculum (Gauteng DOH nursing college curriculum, 2003:14).

Study conducted in Saudi Arabia had similar results of high knowledge in the mode of HBV transmissions (Alam 2002:387). In Contrast Iranian HCWs could not correctly identify the risk of HBV transmission (Moghimi et al 2007:3).

### **5.5 FINAL YEAR NURSING STUDENTS' ATTITUDES TOWARDS PREVENTION OF HBV**

The results of this study showed that almost half (52.9%) of the respondents who have never been vaccinated for HBV were less positive about prevention of HBV viral

infection. The study findings correspond with the one among nurses in India and Kenya, the groups showed ignorance about the prevention of HBV (Sukriti et al 2008:1711; Lee 2009:4). The findings can be used to support the lack of positive attitude in this regard. This is contrary to the study findings in the USA reports that HCWs were positive about HBV prevention (Suckling et al 2006:272).

## **5.6 FINAL YEAR NURSING STUDENTS' PRACTICES REGARDING PREVENTION OF HBV**

### **5.6.1 Compliance with universal precautions**

The results of this study showed that the majority 79% respondents demonstrated a good compliance with UP. It is concerning to find that there are student nurses who reported that they do not wear protective clothing when they are helping a pregnant women during delivery as they can be at the risk of contracting HBV. Comparing the knowledge that the students had regarding HBV infection and prevention which was nearly hundred percent (95.8%) with their practice it confirms the notion that states knowledge does not always translate into practice. Only 59.4% report their needle prick injuries. Of 56.8% never experience exposure to blood/body fluid splashes. The large percentage (93%) of HCWs never reported their occupational exposure (Alam 2002:87).

In China the principles of UP have not been widely disseminated, the hospitals do not require self-protective equipments such as gloves. Nurses often make judgements about whether to use universal precautions based on patient diagnoses (Wang et al 2002:189)

### **5.6.2 Vaccination against HBV**

The results of this study show that the majority of females (62.9%) and males (56.0%) were vaccinated. The high rate of vaccination tallies with the Italian findings among HCWs' vaccination rate and their beliefs in the usefulness of vaccinations for preventing hepatitis B infection (Di Giuseppe et al 2007:1671). Contrary to this, in Turkey and Kenya reasons for the HCWs' unvaccinated status were, inability to afford, personal neglect-fullness and anxious about potential adverse effects (Azap et al 2004:51; Suckling et al 2006:273).

## **5.7 GROUP DIFFERENCES IN KNOWLEDGE, ATTITUDES AND PRACTICES**

### **5.7.1 Knowledge**

The results of this study show a significant different in knowledge level among respondents in college A, B and C. Furthermore college A and B differed significantly from one another with  $P < 0.001$ . In UK HCWs exhibited substantial lack of knowledge concerning transmission risks of HBV (Stein et al 2003:72).

### **5.7.2 Attitudes**

The results of this study show that there was significant difference of attitudes between college A and B students as well as in college C. The students from college A had significantly higher score compared to college B students (0.001) and college C students ( $p=0.017$ ). The study findings correspond with that of Saudi Arabia as 8.9% HCWs believed that they were naturally immune and underestimated the seroconversion rate of hepatitis B (Paul et al 1999:86).

In UK the doctors indicated time as constrain for washing hands while nurses had proved to have a better attitudes concerning a more compliance with UP (Stein et al 2003:72).

### **5.7.3 Practices**

The results of this study show that college A nursing students had obtained high score  $SD=3.28$  followed by college B  $SD=3.02$  and college C  $SD= 3.29$  for compliance with UP. Similar unsatisfactory results of college B and C was found in Washington, Iran, France and Australian HCWs' use of gloves, double, gloves, goggles and mask (Ong et al 1999:83; Patterson 1998:269; Tarantola et al 2006:360; Moghimi et al 2008:3). The good practices were also found among nurses in Australia as they put on gloves when handling blood/blood equipment, urine and faeces (Knight and Bodsworth 2001:748). The Australian nurses also wash hands before and after putting on the gloves (Stein et al 2003:70).

### **5.7.4 Vaccination**

The results of the study revealed significant differences in the rate of vaccination among students from college A (90.9%), college B (29.3%) and college C (15.6%). However, the vaccination rates that are displayed by the students in the study can be considered to be based to their particular context. The college A findings is supported by reports from Italia and Iran (Di Giuseppe et al 2007:1762; Moghimi et al 2007:4). Contrary to this in Saudi Arabia only few HCWs remain unvaccinated (Paul et al 1999:86).

### **5.7.5 Occupational exposure**

Study result show that 75% of college A students had occupational exposure, college B students had 30.9% and college C only 8.2%. The high occupational exposure is similar to 76% experienced by Australian nurses (Knight and Bodsworth 2001:748)

## **5.8 SUMMARY**

There is one notable trend throughout this analysis of group differences is that students enrolled at college A posted significantly higher scores than their colleagues at other nursing colleges across all but one indexes, indicating that these students are more knowledgeable, have better attitudes, and exhibit better behaviours than many of their peers. However, the lower scores in the other two colleges could have been limited by the small number of participants especially in college C.

## **5.9 LIMITATION OF THE STUDY**

The results may not represent all student nurses in Gauteng province because the study was limited to public nursing colleges only.

## **5.10 RECOMMENDATIONS ON IMPROVING KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING THE PREVENTION OF HEPATITIS B VIRUS INFECTIONS, IN FINAL YEAR COLLEGE STUDENT NURSES IN GAUTENG PROVINCE**

### **5.10.1 Creating a safe environment**

Initiate strategies to demand compliance of protection in risky occupational procedures such as use of gloves and goggles. Follow up with serological test whenever there is an individual with work related injuries with biological material (Lee, 2009:5). There should be adequate supply of equipments for procedures and safe needle disposal (Azap et al 2005:52).

### **5.10.2 Teaching strategies**

Discussion in small groups for students will allow them to share their experiences in the different clinical practical environments (Yassi 2009:362).

### **5.10.3 Appropriate training and support**

Continuous education and training of qualified nurses should be implemented consistently as they are responsible for supervising and teaching student nurses in the practical areas. Qualified nurses should also lead by example through taking up HBV vaccine and this behaviour could also help to increase vaccination coverage among all categories of nurses. Principles of vaccination against work related diseases to be included in the student nurse's curricula like with principles of infection control from their first year of training. Qualified nurses should be updated on new development on infection control measures in clinical practical areas because of their responsibility toward student learning outcomes. They should order adequate protective clothing and taking a stand if not available in the hospital.

The curricula and vaccination policies of the colleges need to be examined in a separate study so that whatever they are doing in college A can be identified and implemented by the other colleges.

## **5.11 CONCLUSION**

The study has assessed knowledge, attitudes and practices of student nurses in their final year of training. According to this study the knowledge, attitudes and practices rate among the student nurses still differs according to the college they are enrolled in. There is a need to explore further the availability of equipments and mentorship of students in the clinical areas with regards to implementation of infection control measures. Understanding how behaviour changes takes place will help the hospital managers, ward supervisors and sisters to improve knowledge, attitudes and practices of the student nurses. However, the implications of the findings could serve to inform

managers to improve the prevention strategies for HBV infection among student nurses

The curricula and vaccination policies of the colleges need to be examined in a separate study so that whatever they are doing right at college A can be identified and be implemented in the other colleges.

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## APPENDIX: A

# KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING THE PREVENTION OF HEPATITIS B VIRUS INFECTIONS, IN FINAL YEAR COLLEGE STUDENT NURSES IN GAUTENG PROVINCE

## 1. KEYS TO RESPONSE

Please answer the following questions and **choose one answer that best expresses your opinion by placing a tick in the relevant box**

### Section A: Demographic details

#### 1. Gender

Male	
Female	

#### 2. Indicate the name of your college

#### 3. What was your age on your last birthday?

3.1 21 to 25

3.2 26 to 30

3.3 31 to 35

3.4 36 to 40

3.5 41 to 45

3.6 46 years or above

## Section: B

4. Can hepatitis B be caught through casual contact such as holding of hands?

Yes	
No	
Don't know	

5. People who are carriers of hepatitis B are at risk of infecting others

Yes	
No	
Don't know	

6. Hepatitis B vaccine is made from human blood

Yes	
No	
Don't know	

7. Can hepatitis B be spread through contact with open wounds/cuts?

Yes	
No	
Don't know	

8. Can hepatitis B virus cause liver cancer?

Yes	
No	
Don't know	

9. Can hepatitis B vaccine cause mild side effects?

Yes	
No	
Don't know	

10. Can HBV vaccine prevent Hepatitis B?

Yes	
No	
Don't know	

### Section: C

11. Have you ever received a hepatitis B vaccine before?

Yes	
No	
Don't know	

12. If yes in question 11, please name the facility/institution where you received hepatitis vaccine.....

13. How many doses of hepatitis B vaccine did you receive?

One dose	
Two doses	
Three doses	
Don't know	

14. Have you ever had a needle prick injury?

Yes	
No	
Don't know	

15. How many times in the past year did you splash blood or body fluids in the mouth, eyes, nose or on unprotected skin which had wounds or rashes?

10 or more	
5 or more but less than 10	
2 or more but less than 5	
None	
Don't know	

16. If you answered yes in question 14 and 15, how many incidents did you report to the doctor/infection control nurse?

All of them were reported	
Few of them were reported	
None was reported	
Not sure how many were reported	

17. I have antibodies against hepatitis B and do not need the vaccine

Agree	
Disagree	
Not sure	

18. I get time to wear protective clothes when a woman is fully dilated and about to deliver

Always	
Usually	
Sometimes	
Never	
Not sure	

19. I wear goggles during preparation for delivery of a new born baby

Always	
Usually	
Sometimes	
Never	
Not sure	

20. I can change gloves for each patient during blood taking

Always	
Usually	
Sometimes	
Never	
Not sure	

21. I change gloves for each patient during glucose test

Always	
Usually	
Sometimes	
Never	
Not sure	

22. I report for needle stick injury

Always	
Usually	
Sometimes	
Never	
Not sure	

23. Would you be willing to be tested for hepatitis B infection?

Yes	
No	
Don't know	

**Section: D**

**Please complete 27, 28 and 29 only if you have not received hepatitis B vaccine**

**24. I am not at risk for getting hepatitis B**

Agree	
Disagree	
Not sure	

**25. I do not believe in the hepatitis B vaccine**

Agree	
Disagree	
Not sure	

**26. I think hepatitis B costs too much**

Agree	
Disagree	
Not sure	

**27. Changing of the gloves during blood glucose test is a waste of time**

Agree	
Disagree	
Not sure	

If you wish to know your HBV status you will be tested free of charge and therefore you are asked to complete the consent forms below. Please take note that the blood samples will be used in the MSc research project by another student who belongs to



## APPENDIX B

**UNIVERSITY OF LIMPOPO**  
Medunsa Campus



**MEDUNSA RESEARCH & ETHICS COMMITTEE**

**CLEARANCE CERTIFICATE**

P.O. Medunsa  
Medunsa  
0204  
SOUTH AFRICA

Tel: 012 - 521 4000  
Fax: 012 - 560 0066

MEETING: 06/2008

PROJECT NUMBER: MREC/PH/141/2008: PG.

**PROJECT :**

Title: Knowledge, attitude and practices regarding the prevention of hepatitis B virus infections, in final year college student nurses in Gauteng Province

Researcher: Ms M Satekge  
Supervisor: M Mokonoto  
Co-supervisor: Ms R Burnett  
Department: Social and Health Behavioural Sciences  
School: Public Health  
Degree: MPH

**DECISION OF THE COMMITTEE:**

MREC approved the change of title.

**DATE:** 26 November 2009



  
PROF N EBRAHIM  
DEPUTY CHAIRPERSON MREC

**Note:**

- i) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
- ii) The budget for the research will be considered separately from the protocol. PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

*African Excellence - Global Leadership*

<b>Researcher's Name</b>	Mpho Sathikge MPH( Masters in Public Health)
<b>Researcher's contact details:</b>	Fax: 012 319 5699 Cell: 081 762 0855
<b>Research Topic</b>	Knowledge, attitude and practices regarding hepatitis B virus infections in the final year nurse in Gauteng province
<b>Supervisor Name</b>	Mrs. MD Mokonoto, Mrs. RJ Burnett
<b>Date submitted:</b>	27/11/2008;
<b>Date Reviewed</b>	27/11/2008
<b>Reviewer's name</b>	Dr Y Kolisa
<b>Research Site(s):</b>	Four Nursing Colleges in Gauteng : SG Lourens in Tshwane, SAMS in Centurion, Ann Latsky in Johannesburg, Baragwanath in Soweto
<b>Type of research</b>	Health Systems Research

**SECTION A**

10. Is data collection method in line with study design?	X		
11. Is time frame of the proposal adequate to meet the objectives?	X		
12. Is it stated in the proposal the method of dissemination of the results of the research project?		x	
13. Is the possible conflict of interests clarified?		X	
Are financial implications and financial support transparent?			

#### Section B: Proposal summary

Hepatitis B infection is a serious blood-borne disease causing liver infection which may complicate to liver cirrhosis and liver cancer. People at risk include all health care workers in contact with blood and human secretions. Nursing students from their first year of training are placed in wards and clinics for practical experience and this puts them at risk of hepatitis B infection. Previous studies have shown that many SA nurse are not protected against HBV and occupational exposures despite availability of HBV vaccine.

4. Are the objectives of the research project adequate?	^	
5. Could the objectives be limited to better focus on the project's main objective?	x	
6. writing style <ul style="list-style-type: none"> <li>• The text of the proposal is clear</li> <li>• The nomenclature used is correct</li> <li>• The references used are relevant, comprehensive and accurate (corrected)</li> <li>• The spelling and grammar are correct</li> <li>• The language needs improvement</li> <li>• The research proposal needs restyling and rewriting</li> </ul>	x x x	x
7. Are the research methods appropriate to the study	x	
8. Does the study have ethical approval? If yes, name the ethics committee <u>Medunsa Campus Research &amp; Ethics Committee- University of Limpopo</u>	x	
1. Is the definition and measurement of variables consistent with the scope of the proposal	X	
10. Is data collection method in line with study design?	X	
11. Is time frame of the proposal adequate to meet the objectives?	X	
12. Is it stated in the proposal the method of dissemination of the results of the research project?		x
13. Is the possible conflict of interests clarified? Are financial implications and financial support transparent?		X

SG Lourens nursing  
College  
Private bag x 755  
Pretoria  
0001  
2008.12.05

The Research Department  
Gauteng Nursing Colleges

#### APPLICATION TO CONDUCT RESEARCH ON FINAL YEAR STUDENT NURSES

I hereby request to conduct a research in January 2009 on final year student nurses. I am a student at MEDUNSA School of Public Health, employed at SG Lourens nursing college.

The research topic is **knowledge, attitudes and practices regarding the prevention of hepatitis b virus infections, in final year college student nurses in gauteng province**

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Herein I have enclosed the following documents:

- Research proposal
- Letter of permission from MEDUNSA
- Letter of permission from Department of health.

Your positive respond will be appreciated.

Yours faith fully  
Mpho Satekge

## **STATEMENT BY THE RESEARCHER AND COSENT FORM TO STUDENTS**

### **STATEMENT BY THE RESEARCHER**

#### **A STUDY KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING THE PREVENTION OF HEPATITIS B VIRUS INFECTIONS, IN FINAL YEAR COLLEGE STUDENT NURSES IN GAUTENG PROVINCE**

I provided written information regarding participation in the study entitled “Knowledge, attitudes and practices regarding hepatitis B viral infection prevention and HBV vaccine in final year college student nurses in Gauteng Province” and voluntary testing for Hepatitis B which is part of the overarching research project entitled “Institutional policies and training in hepatitis B virus prevention and control, and the infectivity and immunity of health care workers in South Africa and I agree to answer any future questions concerning HBV testing as best as I am able; and I will adhere to the protocol for my study entitled “Knowledge, attitudes and practices regarding hepatitis B viral infection, in final year student nurses in Gauteng Province” which needs to be approved by the MCREC.

.....	.....	.....	
.....			
Name of Researcher	Signature	Date	Place

### **CONSENT FORM TO STUDENT NURSES**

I have been given verbal information about the aim and objectives of this study, and have also been given the opportunity to ask questions and receive further information about this study, and am satisfied that I have received enough information about this study. I know that I am free to decline participation in this study, and that this will have no bearing on my future learning experience at this teaching facility. I know that this study has been approved by the Medunsa Research Ethics Committee, and I am fully aware that the results of this study will be used for scientific purposes and may be published. I have not been asked to provide any means of identification, and there is no way of linking me to this study. By filling in this questionnaire I am consenting to take part in this study

Date: .....

## CONSENT FORM

**RESEARCH TITLE:** Institutional policies and training in hepatitis B virus prevention and control, and the infectivity and immunity of health care workers in South Africa.

**NAME OF RESEACHER:** Mpho Satekge

**CONTACT NUMBERS:** (W) 012 319 5600 ext (5427) Cell 0847620855

**MREC NUMBER:** MREC/PH/87/2008: IR

I have read the information on the research topic entitled “Institutional policies and training in hepatitis B virus prevention and control, and the infectivity and immunity of health care workers in South Africa” and was provided the opportunity to ask questions and given adequate time to rethink about testing for Hepatitis B infection. I understand that the aim of the study is to: investigate institutional policies and training in hepatitis B virus prevention and control, and the infectivity and immunity of health care workers in South Africa. I also understand that only (2.5mls) of blood specimen will be drawn from me and tested for hepatitis B virus. I am assured that there is no risk and compensation for participating in HBV testing and; anonymity will be maintained during the publishing of results, if I am tested HBV positive, I will be informed privately and any remaining blood sample will be destroyed by the M Sc student researcher, I am free to decline participation and withdraw in blood sample testing for HBV and that all these will have no bearing on my academic achievement. I know that the study on “Institutional policies and training in hepatitis B virus prevention and control, and the infectivity and immunity of health care workers in South Africa” has been approved by the Medunsa Campus Research and Ethics (MCREC), University of Limpopo (Medunsa Campus) I am fully aware that the results of this Project will be used for scientific purposes and may be published. I thus, agree to drawing of blood for HBV testing, provided my privacy is guaranteed.

I hereby give consent to the drawing of blood for Hepatitis B infection.

.....  
Name of student nurse

.....  
Signature of student nurse

.....  
Place.

.....  
Date.

.....  
Witness