KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING HIV/AIDS AMONG DENTAL STUDENTS AT MEDUNSA ORAL HEALTH CENTRE

MASTER OF PUBLIC HEALTH

M L GALANE

2012

KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING HIV/AIDS AMONG DENTAL STUDENTS AT MEDUNSA ORAL HEALTH CENTRE

by

MPATIKANA LESLIE GALANE

RESEARCH DISSERTATION

submitted in partial fulfilment of the requirements for

the degree of

MASTER OF PUBLIC HEALTH

at the

FACULTY OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

at the

UNIVERSITY OF LIMPOPO MEDUNSA CAMPUS

SUPERVISOR: DR S MNDZEBELE

2012

DECLARATION

I, Mpatikana Leslie Galane, hereby declare that the work on which this dissertation is based, is original (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree at this or any other university or tertiary education institution or examining body.

....day of.....20.....

Galane M L (DR)

ACKNOWLEDGEMENTS

I would like to acknowledge the following people and organisation(s) for their contribution to this dissertation:

- My supervisor, Dr Samuel Mndzebele, my sincere thank you for your constructive criticisms and for being patient with me.
- Ms Amme Tshabalala for opening a new world of public health to me.
- Mr Ngoako Jay Morokolo, thank you for your consistent creative assistance.
- My grandparents, Mrs Elizabeth and the late Mr Andries Galane for their love of education that inspired me.
- To my parents Mrs Martha and Mr Johannes Galane, together with my two lovely sisters: Lindiwe and Cynthia Galane for their continuous emotional support.
- Mr Moeketsi Montsho, together with my aunt Mrs Maria Selamolela for their continuous and valuable support and encouragement.
- Dr Malele Kolisa, for all your expertise advices through this critical work of research.
- Dr C.S. Lefothla I greatly appreciated your proactiveness, tenacity, determination and assistance during data collection period
- Statistical guidance and advice of biostatisticians Mr M.E. Hoque and Prof A.O. Ayo-Yusuf, thank you for availing yourselves.
- The dental students at the Medunsa Oral Health Centre who agreed to participate in this study. Without you guys this research couldn't have been a success.
- Not forgetting friends and colleagues in particular Dr N.R. Nkambule and Dr M. Rantao for their readily available support, guidance and understanding

ABSTRACT

Background: The HIV pandemic continues to be a major public health problem in Sub-Saharan Africa where 22.5 million people were infected with HIV in 2009 and South Africa remains one amongst the countries with the highest HIV epidemic. The number of HIV-positive and AIDS patients is increasing annually and there are no specialised oral health institutions that provide oral health care to HIV/AIDS patients. HIV and AIDS continues to have profound impact on all health training and education *(Medical, Dentistry, Nursing etc.)* and clinical care, hence it is crucial for all the health care students to be educated about HIV/AIDS disease. Dental student's knowledge about HIV/AIDS, attitudes towards HIV-positive patients and infection control practices are of importance as they are the future oral health care providers.

The Purpose: The purpose of the study was to determine the knowledge, attitudes and practices of third, fourth and fifth year dental students on HIV-positive and AIDS patients at the Medunsa Oral Health Centre (MOHC).

Materials and Methods: This was a cross-sectional study conducted among 139 dental students at MOHC using a self administered questionaire with 30 closed-ended questions. T-test, one-way Anova (*analysis of variance*), multiple regressions and Pearson's correlation were applied by Stata IC/10 to assess, determine and describe the knowledge, attitude and infection control practices of third, fourth and fifth year dental students, respectively and also find an association between demographic variables, knowledge, attitudes and practices.

Results: The response rate was 86% (120/139), 33 of third year, 47 of fourth year and 40 of fifth year dental students. Gender was statistically significant towards knowledge and females were more knowledgeable about HIV/AIDS as compared to males ($p=0.058$). However, almost (98.3%) all dental students were not sure "HIV increases other infections, including oral infections as well". More than half (53.1%) of third year dental students were not sure "persistent generalised lymphadenopathy

is associated with stage 2 of HIV infection". In this study, ethnic groups and level of study (BDS4 & BDS5) were found to be significant predictors of attitude regarding HIV-positive patients (p=0.001) (p=0.055) (p=0.001). Practice was found to be a significant predictor of knowledge regarding HIV/AIDS (p=0.046). Pearson's correlation coefficient showed students with positive attitude scores had significantly excellent practice regarding HIV/AIDS (r=0.2912) (p=0.001). Good knowledge translates into excellent infection control practices, whilst positive attitude towards HIV/AIDS patients yield excellent infection control practices.

Conclusion: The dental students at MOHC relatively have a good understanding of HIV/AIDS (*particularly the mode of transmission*) but to lesser extent, disease progress and oral manifestation. The lack of knowledge on HIV/AIDS and inconsistency regarding certain infection control procedures may be a reflection of insufficient HIV/AIDS teaching and clinical supervision of students in the wards. There is a need to improve the current dental curriculum by including HIV/AIDS module and incorporate a clinical component of dental screening at the ARV clinics.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS

AIDS	Acquired Immune-deficiency Syndrome
ARV	Antiretroviral
CDC	Centres for Disease Control and Prevention
CPR	Cardio-Pulmonary Resuscitation
DCP	Dental Care Providers
DOH	Department of Health
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immune-deficiency Virus
HPCSA	Health Professions Council of South Africa
KAP	Knowledge, Attitudes and Practices Survey
MOHC	Medunsa Oral Health Centre
MREC	Medunsa Research and Ethics Committee
OH	Oral Hygiene
OHCW	Oral Health Care Workers
TCOHC	Trained Caregivers in Oral Health Care
UNAIDS	Joint United Nations Programme on HIV/AIDS
WHO	World Health Organization

CHAPTER 1:
INTRODUCTION

This chapter will give details to the introduction of this study, the problem statement which explains why we are embarking on this study in Sub-section 1.2. It also spells out the aim of the study and research questions and lastly, Sub-section 1.5 lists the objectives of the study.

1.1 INTRODUCTION

The Human Immune-deficiency Virus/Acquired Immune-deficiency Syndrome (HIV/AIDS) epidemic in South Africa continues to grow at a rapid rate (Dorrington, Boure, Bradshow, Laubscher & Timaeus, 2001). A joint United Nations Programme on HIV/AIDS (UNAIDS), estimated that 22.5 million (20.9 million–24.2 million) people infected with HIV resided in the Sub-Saharan Africa in 2009 (UNAIDS, 2010). South Africa still remains one amongst the countries with the highest HIV epidemic. UNAIDS estimated 5.6 million (5.4 million–5.8 million) of the population of South Africa to be HIV-positive people (UNAIDS, 2010). Only 28% of people in South Africa with an advanced stage of HIV were receiving Antiretroviral (ARV) treatment in 2007. In 2004, 2005 and 2006, the figures were 4%, 15% and 21% respectively (UNAIDS, 2008). This indicates that the number of HIV-positive and AIDS patients is increasing annually and there are no specialised oral health institutions that provide oral health care to HIV/AIDS patients.

HIV and AIDS continues to have profound impact on all health training and education *(Medical, Dentistry, Nursing etc.)* and clinical care, hence it is crucial for all the health care students to be educated about HIV/AIDS disease (McDaniel, Stephen & Carlson, 1995). To carry out effective clinical management of HIV-positive and AIDS patients, health care students need to be aware and understand the impact of HIV/AIDS in a health care setting. Dental procedures frequently involve blood and saliva that contains a variety of blood-borne, pathogens and micro-organisms, such as HIV and hepatitis viruses (Sadeghi & Hakimi, 2009). However,

unprotected sex, substance abuse, contaminated blood transfusions, mother-to-child-transmission and occupational exposures contributed to the high rate of HIV infection (Ahmed, Hassali & Aziz, 2009 and Health Care Professions Council of South Africa, 2008).

The World Health Organisation (WHO) approximated that 40-50% of HIV-positive patients have oral lesions which are strongly associated with HIV-infection (WHO, 2005 and Shangase, Feller & Blignaut, 2004). These oral lesions are of great help to detect the severity and progression/stages of HIV infection in HIV-positive and AIDS patients (Shangase et al., 2004). Oral health is considered an integral and inseparable part of the general health of the individual (De Carvalho Sales-Peres, S.H., Mapengo, De Moura-Grec, Marsicano, De Carvalho Sales-Peres, A. & Sales-Peres, A., 2012).

The discomfort of oral lesions associated with HIV/AIDS, has a negative impact on the quality of life of people living with HIV/AIDS (WHO, 2004), by reducing food intake as a result of discomfort during eating (Rwenyonyi, Kutesa, Muwazi, Okullo, Kasangaki & Kekitinwa, 2011). There is a need for good oral health care in patients who present oral lesions associated with HIV/AIDS, including: immediate care, treatment of oral lesions, prevention of secondary lesions and referral to relevant departments for further disease management (Holmes & Stephen, 2002).

It is unethical and also unlawful for oral health care practitioners to deny HIV-positive and AIDS patients dental treatment (Oliveira, Narendran & Falcão, 2002). The Health Professions Council of South Africa (HPCSA) is a statutory body established in terms of the Health Professions Act No. 56 of 1974 and is intended to promote the health of South Africa's population and healthcare settings and maintain fair standards of professional practice (HPCSA, 2007). The HPCSA compiled ethical guidelines for good practice with regard to HIV (HPCSA, 2008). These guidelines are the product of consultations with different stakeholders and the revisions are consistent with international standards of best practice, such as is contained in the

guidelines from the UNAIDS, WHO and the Department of Health's (DoH) Comprehensive Document on HIV/AIDS (HPCSA, 2007).

As health care providers are committed to maximising human health and well-being, we should do everything in our power to promote the prevention of HIV, as well as providing access to the best-possible preventative, promotional, curative and rehabilitative care (HPCSA, 2008). Oral health practitioners have a major role of not only diagnosing an oral manifestation of HIV, but to also distinguish the significance of the manifestation and identify comprehensive management of HIV related oral lesions (Kaste & Bednarsh, 2008). In future, oral health practitioners can expect to play a role in screening HIV infection through rapid testing in the dental office (Franco-Paredes, Tellez & del Rio, 2006). It is against all ethical and professional rules for a health care practitioner, to refuse to treat a patient on the basis of perceived patient's actual HIV/AIDS status (Sadeghi & Hakimi, 2009 and HPCSA, 2008). It is generally accepted that a dentist and other health care workers provide quality treatment and care to all individuals indiscriminately.

Dentists have a professional and ethical responsibility to provide treatment to patients with HIV and AIDS, particularly since HIV associated lesions are easily identified from the oral cavity, before the patient can look physically debilitated (Nasir, Astrom, David & Ali, 2008). Dental students' knowledge about HIV/AIDS, attitudes towards HIV-positive patients and infection control practices are of importance as they are the future oral health care providers. Hence the purpose of this study was to determine the knowledge, attitudes and practices of dental students on HIV-positive and AIDS patients at the Medunsa Oral Health Centre.

1.2 PROBLEM STATEMENT

Several international studies found that students who are in the healthcare profession, who are knowledgeable about HIV, are keen to work with HIV-positive and AIDS patients (McDaniel et al., 1995; Maimaiti, Shamsuddin, Abdurahim, Tonti & Mamet, 2010; Cohen, Romberg, Dixon & Grace, 2005). However, a South African

study conducted amongst qualified oral hygienists and dental therapists found that oral hygienists and dental therapists had sound general knowledge on the mode of transmission of HIV/AIDS and oral manifestation of HIV/AIDS, but it was recommended that training programs should still pay a particular attention to knowledge transfer on basic concepts of HIV/AIDS, HIV progression, Oral manifestation of HIV/AIDS, preventative measures during occupational exposure and infection control practices (Mathabathe, 2006).

Dental programs have long embraced the responsibility to prepare their students to deal with the HIV/AIDS epidemic (Cohen et al., 2005). Dental faculties can play an important role as a model for dental students *(future dentists)* to be educated on critical issues regarding HIV/AIDS (Sadeghi & Hakimi, 2009). A number of researchers globally found that sound knowledge about HIV/AIDS among various students population, including nursing, dental, medical and pharmacy undergraduate students does not translate to a positive attitude towards HIV-positive and AIDS patients (Jain, Mathur, Kumar, Dagli, Prabu & Kulkarni, 2008; Ahmed et al., 2009; Maimaiti et al., 2010; Ryalat, Sawair, Shayyab & Amin, 2011). However, very little is known about the knowledge, attitudes and practices of dental students in South Africa. Thus this study will focus on dental students in a dental hospital in Pretoria, South Africa.

1.3 THE AIM OF THE STUDY

The aim of the study was to determine the knowledge, attitudes and practices of third, fourth and fifth year dental students on HIV-positive and AIDS patients at the Medunsa Oral Health Centre (MOHC).

1.4 THE PURPOSE OF THE STUDY

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

i. What is the general knowledge of third, fourth and fifth year dental students at MOHC regarding HIV/AIDS infection?
ii. What is the attitude of third, fourth and fifth year dental students at MOHC towards HIV-positive and AIDS patients?
iii. What are the practices of third, fourth and fifth year dental students towards HIV-positive and AIDS patients?
iv. Is there a relationship between knowledge, attitude and practices of third, fourth and fifth year dental students regarding HIV-positive and AIDS patients?

1.5 OBJECTIVES

The objectives were to:

i. Assess the general and oral health specific knowledge of third, fourth and fifth year dental students on HIV and AIDS at MOHC.
ii. Determine the attitudes of third, fourth and fifth year dental students at MOHC, towards treating HIV-positive and AIDS patients.
iii. Describe the practices followed by third, fourth and fifth year dental students who treat HIV-positive and AIDS patients at MOHC.
iv. Determine if there is a relationship between knowledge, attitude and practices of third, fourth and fifth year dental students, regarding HIV-positive and AIDS patients.

CHAPTER 2:
LITERATURE REVIEW

We first define the terms that will be used as often during the presentation of this study in Sub-section 2.1. This chapter also gives us an opportunity to lay out the definition of *Knowledge, Attitude and Practices Studies*, otherwise known as KAP Studies. We also review in detail, the South African KAP Studies in Sub-section 2.4 and how they fair with International studies in Sub-section 2.3, but most importantly to draw from those findings and lessons learnt (both *internationally and locally*) and to identify how or where else we can improve the delivery of healthcare service in Southern Africa.

2.1 DEFINITIONS OF TERMS

Knowledge is information, facts, descriptions and awareness gained through experience or education. It can refer to the theoretical or practical understanding of a subject (Waite & Hawker, 2009). One can acquire knowledge from different sources e.g., newspapers, television, internet, books, journals or being taught formally or informally etc.

Attitude refers to the feelings that one have towards a certain individual, as well as preconceived ideas that may prevail. Attitude is a belief and a feeling that predisposes one to respond in a particular way to objects, people and events (Kaliyaperumal & Expert, 2004 and Malele-Kolisa, 2009).

Practice is an act of doing something rather than the theories about it. It is when someone does something repeatedly to improve his/her own skills (Waite & Hawker, 2009). Stegman (2006) defines practice as the exercise of the profession of medicine or one of the allied health professions. However, Kaliyaperumal & Expert (2004) refer to practices as the ways in which they demonstrate their knowledge and attitude through their actions.

HIV is an acronym for the Human Immune-deficiency Virus (Stegman, 2006). HIV damages a person's body by targeting specific blood cells (CD4+ and T lymphocytes cells), which are crucial to improve the body's defence system. Your body has to have these cells to fight infections and disease, but HIV invades them and replicates itself to make more copies and then destroys them. Over time, HIV can destroy so many of the CD4 cells so that the body can't fight infections and diseases anymore. It is a virus that can lead to AIDS (CDC, 2006).

AIDS stands for Acquired Immune-deficiency Syndrome.

Acquired – means that the disease is not hereditary, but develops after birth from contact with a disease-causing agent (in this case, HIV).

Immune-deficiency – means that the disease is characterised by a weakening of the immune system.

Syndrome – refers to a group of symptoms that indicate or characterise the disease. In this case, symptoms will include the development of certain infections (skin, oral, ear and eye) and/or cancers, as well as a decrease in the number of specific blood cells, such as CD4+ and T cells, which are crucial to helping the body fight diseases (CDC, 2006).

AIDS is a deficiency of cellular immunity induced by infection with the human immune-deficiency virus (HIV-1) and is characterised by opportunistic diseases including, *Pneumocystis jiroveci* (formerly *carinii*) pneumonia, Kaposi Sarcoma, cytomegalovirus, candidal esophagitis, tuberculosis, non-hodgkin lymphoma, herpes zoster and others (Stegman, 2006).

Dental is an adjective relating to the teeth or dentistry (Waite & Hawker, 2009) and is associated with a dentist, dental hygienist, dental technician or dental assistant, as medical professions.

Dental Student is a person who is studying dentistry or studying to become a dentist at a higher learning institution e.g., university or college.

2.2 KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) STUDIES

The Knowledge, Attitudes and Practices (KAP) was first explored in the field of family planning and population studies in 1950s (Launiala, 2009). In the 1960s and 1970s, many studies on community perspective and human behaviour grew at an alarming rate in response to the need of primary health care approach (Schopper, Doussantousse & Orav, 1993) and KAP surveys also established their path among other research methodologies used to investigate health behaviours (Launiala, 2009). KAP survey is a needs assessment study which intends to determine the *knowledge* (K), *attitudes* (A) and *practices* (P) of a population or community (Malele-Kolisa, 2009) and it also serves as an educational diagnosis of the community (Kaliyaperumal & Expert, 2004). KAP study tells us what people know about certain things, how they feel and also how they behave (Kaliyaperumal & Expert, 2004). KAP surveys can be used to provide policy guidelines, in addition to providing the overall scenario on the issues in which they are designed for (Malele-Kolisa, 2009).

The main purpose of this KAP study is to explore the knowledge, attitudes and practices of third, fourth and fifth year dental students on HIV-positive and AIDS patients at MOHC. Knowledge for this study population refers to their understanding of the oral manifestation of HIV, mode of transmission of HIV/AIDS, the progression of the disease and also the preventative measures that one can take during occupational exposure. The attitudes are the feelings of the participants towards HIV-positive and AIDS patients, as well as any preconceived ideas that they may have towards HIV/AIDS patients. The practices refer to the ways in which they demonstrate their HIV/AIDS knowledge and attitude through their actions, in relation to the infection control procedures.

KAP surveys are easily designed, converted into quantifiable data, concise, easy to conduct, cost-effective and effortless presentation of results. It is also assumed that

the results could be generalised nationwide (Launiala, 2009). It can be a futile exercise to ask questions related to local viewpoints about illnesses in the format of a KAP survey, because communities don't share the same philosophies, hence the local viewpoints will turn out to be vague. Malele-Kolisa (2009) identifies that if variables are pre-coded, this almost lead the participants towards the responses listed and might not be an accurate reflection of real knowledge or attitude levels in the group being studied.

2.3 INTERNATIONAL STUDIES

2.3.1 Knowledge on HIV/AIDS

Ryalat et al. (2011) conducted a study aimed at addressing the suspected deficiency in the levels of knowledge of HIV/AIDS, among clinical and pre-clinical dental students at the University of Jordan. Although the students have always reported a good knowledge regarding HIV/AIDS, Ryalat et al. (2011) reports that there are several important misconceptions and knowledge deficits as some essential aspects of control and prevention of transmission of the disease, which still remain common:

> *1. Boiling could be a sterilisation procedure to kill HIV, 2. HIV can be transmitted through kissing with saliva exchange among HIV/AIDS and negative persons and 3. Food in the restaurant that has been prepared by HIV/AIDS people can transmit HIV/AIDS*. (Jain et al., 2008; Ahmed et al., 2009; Maimaiti et al., 2010; Ryalat et al., 2011).

Shaikh, Shankar & Vinay (2011) categorised knowledge of students into moderate, adequate and inadequate knowledge, whereby in their study amongst dental students in Oxford Dental College Hospital and Research, 76.6% of students had moderately adequate knowledge, 22.6% had adequate knowledge and only 0.9% had inadequate knowledge. It is obvious that having adequate knowledge about HIV/AIDS enhances confidence in students' ability to manage infected patients (Ryalat et al., 2011). The fifth year dental students compared to the third year students felt that the teaching they received on virology, blood-borne virus risk

groups and on sterilization practice and procedures was inadequate (Ryalat et al., 2011 and Shaikh et al., 2011). In contrast (Jain et al., 2008 and Sadeghi & Hakimi, 2009), there was a remarkable correlation between the year of study and their levels of knowledge and attitude towards HIV/AIDS patients. The female students had significantly higher knowledge about identifying oral manifestations of HIV/AIDS and they tend to follow certain infection control measures more carefully than males (Oliveira et al., 2002; Jain et al., 2008; Sadeghi & Hakimi, 2009). A high number of female students identified Kaposi Sarcoma as an oral manifestation of HIV/AIDS (Oliveira et al., 2002).

2.3.2 Attitude on HIV/AIDS

An assessment was done by Maimaiti et al. (2010) at the University of Xinjing on the knowledge, attitude and practices of students regarding HIV/AIDS. Only 38.8% of the students had a positive attitude towards HIV/AIDS and HIV-positive patients, while 86% of the dental students believed that HIV-positive patients are like any other patients and they need their help (Maimaiti et al., 2010). Cohen et al. (2004) conducted a study to gain a better understanding of dental hygiene students' attitudes toward AIDS and homosexuals. Students responded more negatively to individuals with AIDS as compared to individuals with leukaemia.

It appears therefore, that the hygiene students displayed no bias towards homosexuals and only minimal bias toward individuals with AIDS. This is consistent with Jain et al. (2008) outcomes that 30.20% of the students held an overall negative attitude, 25.9% of the students would have let patients die of HIV/AIDS. In this study, an alarming outcome of 63.8% students showed preferences to work in AIDS free areas and 46.5% viewed HIV-positive patients as time-consuming. Negative attitude is a barrier to provide quality oral health care to patients with HIV and AIDS (Ahmed et al., 2009). Most studies show that participants had good knowledge about HIV/AIDS, but negative attitude was prevalent (Jain et al., 2008; Ahmed et al., 2009; Ryalat et al., 2011). These findings are consistent with those of Sadeghi & Hakimi (2009) whereby only 1% of his respondents had professional attitude towards HIV-

positive patients. Willingness to treat is thought to be a significant predictor of the actual treatment of HIV-positive patients.

2.3.3 Infection Control Practices

Most studies are focussed on knowledge and attitudes and perceptions of risks regarding HIV and AIDS, but only few focuses on infection control practices and managing HIV-positive patients in a dental setting. Cross-infection can theoretically take place from patient to patient, from dentist to patients and vice versa (Sadeghi & Hakimi, 2009). The estimated risk of HIV transmission from general practice dentists to their patients is recognised to be minimal if infection control guidelines are strictly adhered to (Darling, Arendorf & Samaranayake, 1992).

Ryalat et al. (2011) says Jordanian students rated their teaching received on cross-infection and barriers in dentistry as adequate or more than adequate. Whereas, Sadeghi & Hakimi (2009) says that Iranian students (24.5%) agreed that saliva can be a vehicle for transmission of AIDS and 72.5% of the students thought that Cardio-Pulmonary Rescuation (CPR) can transmit HIV/AIDS and this was in line with Oliveira et al. (2002). This response was an obvious revelation of deficiency in HIV/AIDS knowledge, infection control and barrier usage as effective method of infection control practices.

2.4 SOUTH AFRICAN STUDIES

2.4.1 Knowledge on HIV/AIDS

Darling et al. (1992) were amongst the first researchers to determine the HIV/AIDS KAP of oral health care workers in South Africa. Their first research in HIV/AIDS KAP set the scene for subsequent studies in South Africa, which adapted similar method of determining the HIV/AIDS KAP of oral health care workers (Mathabathe, 2006). One of the earliest study was (*to determine dental and oral hygiene students' knowledge of HIV infection and AIDS*) published in 1994 by Hartshorne, Carstens, Engelbrecht and Hattingh (Hartshorne, Carstens, Engelbrecht & Hattingh, 1994).

The study was carried out among 30 Oral Hygiene (OH I & II) and 79 dental students (BCHD III & VI) at the University of Stellenbosch. Most students agreed that HIV-sero-positive people are entitled to the same dignity and respect as those who are suffering from other illnesses. However, students were concerned about treating sero-positive patients. Most of them would have preferred to receive training in the management of these patients in a controlled environment. Students had a poor perception of the risk of infection, following needle-stick injury and whether HIV could be transmitted through contact with saliva (Hartshorne et al., 1994). Most students felt that they had insufficient lectures on HIV/AIDS and had practically no clinical exposure to HIV-sero-positive patients. This indicated a gap that dental students did not develop adequate knowledge and skills to diagnose and manage HIV/AIDS patients, as well as to maintain appropriate infection control measures to prevent the transmission of HIV and other blood borne pathogens (Oliveira et al., 2002).

Erasmus, Luiters & Brijlal (2005) conducted a study among oral hygiene and dental students on knowledge, attitude and behaviour in managing HIV/AIDS patients at the University of Western Cape dental faculty. Students' knowledge on HIV/AIDS, their behaviour and attitude in treating HIV/AIDS patients, the precautionary measures practiced and their perceptions of curriculum preparation on HIV/AIDS were assessed. Their conclusion was:

> *Students' knowledge on HIV/AIDS generally increased with the years of their studies* (Erasmus et al., 2005).

This is consistent with Bezuidenhout & Summers (2009) results, that HIV/AIDS knowledge of pharmacy students at baseline was inadequate. After the teaching intervention, the first year students achievement levels increased by 80% and 86% respectively. Most students (98.7%) felt that HIV/AIDS is a problem in South Africa. Most students (n=142, 94.7%) had a good understanding of the terms, HIV-positive and AIDS (Erasmus et al., 2005). There is a good indication that teaching

intervention makes a huge difference in endowing students with knowledge regarding HIV/AIDS.

In both developed and developing countries, oral health care is neglected in people who are HIV-positive and those with AIDS. Hospitalised HIV-positive orphans and abandoned children in South Africa are some groups that have been reported to not receive proper oral health care. Children suffer from common preventable oral diseases, such as caries, candidasis and ulceration of the mucosa. These diseases are easily detected, but caregivers do not seem to have the knowledge on how to provide the children with adequate oral hygiene (Blignaut, 2007). Malele-Kolisa (2009) conducted a study in Gauteng to determine the knowledge and attitudes and practices, regarding common oral manifestation associated with HIV/AIDS of caregivers, providing palliative care to HIV-positive and AIDS patients. Caregivers play a major role by assisting families in providing care, in the homes of HIV/AIDS patients who are terminally ill and by helping patients to manage HIV/AIDS.

Mathabathe (2006) made findings that demonstrated a considerable gap in the skills of oral hygienist and dental therapists, with regards to the diagnosis and management of HIV-associated oral lesions, counselling and management of HIV-positive patients and in handling occupational exposures in the dental clinic. This is a good indication that a continuous education on the presentation, diagnosis and management of HIV/AIDS associated lesions is crucial to dental students. Dentists have an ethical responsibility to manage HIV-infected patients more comprehensively, particularly because oral lesions are common among these patients (Blignaut, 2007). Similarly, these findings were found to be consistent with those of international researches that show that Oral Health Care Workers (OHCW) need not only education about HIV/AIDS, but also behaviour change models, because knowledge alone is not enough to effect desired practices (Mathabathe, 2006; Ahmed et al., 2009; Cohen et al., 2005).

2.4.2 Attitudes on HIV/AIDS

The attitudes are health care workers' feelings and pre-conceived ideas towards oral manifestations of HIV/AIDS (Malele-Kolisa, 2009). However, Seacat, Litt & Daniels (2009) conceptualise prejudice as biased attitudes, such as dislike, anger, disgust and contempt felt by Dental Care Providers (DCP) towards a patient because of his or her HIV status. Majority of studies showed that participants had good knowledge of HIV/AIDS, but negative attitude is a clear pattern (Jain et al., 2008; Ahmed et al., 2009; Ryalat et al., 2011; Malele-Kolisa, 2009). This was quite surprising, considering that HIV-related knowledge and participant attributions were virtually unrelated (Seacat et al., 2009).

The dental students (79%) at the University of Western Cape felt that HIV/ADS patients should be treated with respect and dignity at any dental facility. Most students (80%) sympathised with HIV/AIDS patients that they would refer HIV-infected patients to support groups (Erasmus et al., 2004). In Contrast, Malele-Kolisa (2009) discovered that the majority of caregivers, who were not trained in oral health (78%), were concerned about the infection risk from treating HIV-infected patients. They reported that "*cleaning the mouth increases the risk of HIV-infection for caregivers,"* compared to 15% of Trained Caregivers in Oral Health Care (TCOHC) whom also expressed the same concerns (Malele-Kolisa, 2009). This is a clear indication that surely the caregivers, who were not trained in oral health, had inadequate knowledge regarding the mode of transmission of HIV/AIDS.

These findings are once again in-line with Jain et al. (2008) where 30.20% of the participants held an overall negative attitude towards HIV/AIDS patients. When asked *"are you willing to attend a party where individuals with HIV/AIDS are preparing the food?"* 60% of respondents did not want to attend, displaying their negative attitudes (Shaikh et al., 2011). Negative attitude leads to poor quality of care and discrimination and bring about fear to patients seeking treatment (Jain et al., 2008). This was a good sign that adequate knowledge and skills to diagnose and manage HIV/AIDS patients can yield a positive attitude towards patients.

2.4.3 Infection Control Practices

The oral health care setting is perceived as a low risk area for the transmission of HIV/AIDS. Good understanding of the mode of transmission of HIV/AIDS in the dental environment is important. Dental procedures often involve blood and saliva that may contain a variety of blood-borne, pathogens and micro-organisms, such as HIV (Sadeghi & Hakimi, 2009). It is well known that standard infection control measures are effective in preventing occupational transmission of HIV in a dental surgery (Mehtar, Shisana, Mosala & Dunbar, 2007 and Mathabathe, 2007) and it is reported that generally, OHCW adhere to infection control measures during and after patient care. More than 90% of OHCW reported to be wearing gloves during patient care. Disturbingly, 17.6% of OHCW reported to not be washing hands before putting on gloves; 6.7% of OHCW did not change gloves between patients and 10% did not wear masks. The OHCW believed that they do not have adequate information to maintain optimal infection control while treating patients (Oliveira et al., 2001).

These results are in agreement with De Kock & Van Wyk's survey on 56 oral hygienists in South Africa (De Kock & Van Wyk, 2001). Infection control practices of oral hygienists were also found to be inadequate by De Kock & Van Wyk (2001). Only 34% used eye protection and 11.9% did not change gloves between patients. Only 44% of hygienists in the survey reported to have been satisfied with infection control measures in their workplaces. Erasmus et al. (2005) measured students' behaviour practices based on whether they took necessary precautions when treating patients. Moreover to De Kock & Van Wyk (2001), the University of Western Cape oral hygiene students (100%) reported on wearing gloves, protective eyewear and masks when treating patients, whilst dentals students differed in that type of protection worn. These findings reflect a discrepancy between knowledge and clinical application of infection control procedures in the public sector dental practices (Mehtar et al., 2007) and also the dental schools.

The estimated risk of HIV transmission from general practice of dentists to their patients is ought to be minimal, if infection control guidelines are strictly adhered to (Darling et al., 1992). The universal blood and body fluid precautions, commonly

known as standard precautions, developed in 1995 and updated in 2003 by the Centres for Disease Control and Prevention (CDC) recommends that all people (patients), should be treated if they are infected with HIV or other pathogens (CDC, 2003). Only few studies in South Africa were conducted to assess knowledge, attitude and practices of dental students regarding HIV/AIDS patients (Hartshorne et al., 1994 and Erasmus et al., 2005). These studies never examined the influence of other factors such as age, gender, ethnicity, previous training in HIV/AIDS, areas of residence and any previous tertiary qualification and if they have influence towards knowledge, attitude and practices of dental students towards HIV/AIDS patients.

CHAPTER 3:
RESEARCH METHODOLOGY

In Chapter 2 we discussed vastly the literature review both on South Africa and of international studies. We have also generated research questions, aims and objectives of this study. In this chapter we look closely at the study design, tools used to collect data and the setting in which the study was conducted. However, a sample was not taken out at the University of Limpopo as a result of the population size. Notwithstanding the above, Sub-section 3.6 shows that a tool pre-testing was used in another university in Johannesburg, on a group formed by 15 dental students who are in their clinical years and that pertaining ethics within and outside the ambits of the university, were considered in Sub-section 3.7.

3.1 STUDY DESIGN

This was a quantitative, cross-sectional descriptive study, which made use of self-administered questionnaire to survey the knowledge, attitudes and practices of third, fourth and fifth year dental students on HIV-positive and AIDS patients.

3.2 STUDY SETTING

MOHC is an academic institution situated in Garankuwa, North West of Pretoria, which is the semi-urban area. It provides different oral health care services i.e. cleaning of teeth, dental fillings, tooth extractions and construction of false teeth. The institution is also part of the University of Limpopo, Medunsa Campus and is also training students to become dentists, oral hygienists and dental therapists. It provides oral health care services to the communities living in and around Pretoria.

It is divided into seven departments, namely: Department(s) of Maxillofacial and Oral Surgery, Operative Dentistry, Oral Medicine and Periodontology, Dental Public Health, Oral Pathology, Prosthodontics and Orthodontics. There are approximately

50 new incoming patients on a daily basis, 30 referrals from other hospitals and about 200 patients coming in for reviews and follow up appointments.

3.3 STUDY POPULATION

This study was conducted among students who enrolled for a bachelor of dental sciences degree, who were already treating dental patients. During the year of 2012, a total of 139 dentistry students who are in their clinical years were registered at the University of Limpopo. Third year dentistry students were 39 in class, fourth year dentistry students were 61 and fifth year dentistry students were 39, of whom were all treating patients and thus the total study population.

3.4 THE SAMPLE AND SAMPLING TECHNIQUE

A sample size of 109 was calculated to be adequate to provide 80% power, based on the margin of error of 5% and a confidence level of 95%. However, to compensate for possible incomplete data, the sample size was increased by 10%. Therefore, 120 participants were recruited. There was no sampling technique used as this was a small group of students. All 139 dentistry students who were in their clinical years and who volunteered to participate in the study were included.

3.5 INCLUSION AND EXCLUSION CRITERIA

The inclusion criteria was all students who enrolled for a bachelor degree in dental sciences at the University of Limpopo, Medunsa Campus, who were already in their clinical years (third, fourth and fifth year dentistry students). Students who enrolled for other degrees in the school of dentistry, as well as students who were in their first and second years of study in the bachelor degree of dental sciences at the University of Limpopo, Medunsa Campus, were excluded from this study.

3.6 DATA COLLECTION AND TOOLS

Self-administered questionnaires were used to collect data on third, fourth and fifth year dentistry students. The self administered questionnaire was pre-tested among 15 dental students (05 of third, 05 of fourth and 05 of fifth year dental students) in a different university in Johannesburg. The questionnaires were presented to the respondents during a formal class presentation. The aim of this exercise was thoroughly explained to the respondents and the questionnaires were distributed evenly to the respondents who volunteered to participate in the exercises.

Amongst 15 dental students 67% (04 of third year, 05 of fourth year and 01 of fifth year dental students) respondents answered the questionnaire without any difficulties or even requesting clarity on certain questions. Disturbingly, 33% of the respondents raised questions on two specific questions. One was a third year student and 04 were fifth year dental students who said the two questions (13.3%) "*I will perform an emergency resuscitation if an HIV+/AIDS patients need it*" and (20%) "*HIV+/AIDS patients should be quarantined*" on *Attitude* were not as clear. The questions were then modified with an expert's advice. Another question which was not clear was about previous tertiary qualification(s). There was a Yes/No option to that question, raising concerns among students. A pool of different qualifications was then made available as options. The expert also advised that we ask if students had any previous training in HIV/AIDS.

3.6.1 Data Collection

The self-administered questionnaire was constructed only in English, because it is the medium of instruction at the University of Limpopo. The self-administered questionnaire comprised of 30 closed-ended questions *(See Appendix 1)*. Ten questions were based on HIV/AIDS knowledge and mode of transmission, ten questions were based on attitude towards HIV-positive patients and ten questions were based on infection control practices (adapted from Jain et al., 2008; Ryalat et al., 2011; Sadeghi & Hakimi, 2009; Mathabathe, 2007). For closed-ended questions

on knowledge and attitude, the participants were required to state whether they *agree* (A), *disagree* (D) or are *not sure* (NS). For closed-ended questions on infection control practices, the participants were required to state how often they practiced certain infection control practices, whether they *never* (N) *always* (A) *sometimes* (S) *not sure* (NS). The purpose of the study was explained to potential respondents and heed to consent was taken.

Completed questionnaires were collected immediately thereafter. Each question was explained to them before they answer in order to avoid uncertainties. To ensure that participants don't get answers from each other, the questionnaires were distributed to the respondents during a formal lecture period and the researcher was present in the lecture room, while the students were filling in the questionnaires. Each question was explained to them before they answer in order to avoid uncertainties and completed questionnaires were collected immediately thereafter.

3.6.2 Data Analysis

The answers obtained were converted into numerical values. The data was then entered into Microsoft Excel 2007/Spreadsheet and imported onto Stata IC/10 for Windows version, for analysis. The analysis results of the participants' demographics variables, knowledge and practices scores were summarised using descriptive summary measures, expressed as a Mean *(standard deviation)* or Median *(minimum-maximum)* or Continuous Variables *(age and total scores)* and a percent for Categorical Variables (*other demographic information and continuous variables collapsed into categories, such as "Excellent, Good, Moderate and Poor"*). The self administered questionnaire with three sub-sections (*10 Knowledge questions, 10 Attitude questions and 10 Infection Control Practice questions*) was used and scoring was as follows:

a) Knowledge Levels

For every correct answer 02 points was allocated. For the 10 questions in this section, the total would be 20 marks (2x10) for the ideal scenario which is equivalent

to 100%. The ratings: (≥75% = Excellent, 74%-50% = Good, 49%-25% = Moderate and <25% = Poor).

b) Attitude Levels

Only 01 point was allocated for every satisfactory answer, *not sure* and inadequate answers were collapsed into one category and allocated -01 point. For the 10 questions in this section, the total would be 10 marks (1x10) or -10 marks (-1X10) for the ideal scenario which is equivalent to 100%. The ratings: (≥75% = Positive Attitude and ≤74% = Negative Attitude).

c) Practices Levels

Up to 03 points were allocated to every ideal answer i.e., *"always"*. For the 10 questions in this section, the total would be 30 marks (3x10) for the ideal scenario which is equivalent to 100%. The ratings: (≥75% = Excellent, 74%-50% = Good, 49%-25% = Moderate and <25% = Poor).

T-test and one-way Anova were used to compare the mean level of total scores of the knowledge, attitude and practice in relation to HIV/AIDS. Age, gender, ethnic groups, levels of studies, areas of residence, previous training in HIV/AIDS and highest qualifications were taken into consideration. All statistical tests were performed using two-sided tests at a 0.05 level of significance. P-values were reported to three decimal places with values less than 0.001 (<0.001) and values less than 0.05 were considered significant. Multiple regression analysis was used to calculate regression coefficients between two or more predictor variables and the outcomes of knowledge, attitude and practice. Pearson's correlation test was performed to determine the relationship between knowledge, attitude and practice.

3.6.3 Reliability, Validity & Bias

a) Validity

As mentioned earlier, the self administered questionnaire was pre-tested among 15 dental students (five of 3rd, five of 4th and five of 5th year dental students) in a different university in Johannesburg. In the process, we found that there were questions that became vague to the students, particularly the question of whether to attend HIV+/AIDS patients in emergency situations and/or what is accurately supposed to be done. Another question which was not clear was about previous tertiary qualification(s) which by the help of an expert, all the questions that were not clearly expressed were modified. For Internal validity the sample size was calculated to be adequate to provide 80% power, based on the margin of error of 5% and a confidence level of 95% and the sample size was increased by 10% to compensate for the possible incomplete data.

b) Reliability

The questionnaire was adapted from Jain et al. (2008); Ryalat et al. (2011); Sadeghi & Hakimi (2009); Mathabathe (2007) and had a high degree of internal consistency as indicated by Cronbach's alpha correlation coefficient (a=0.67) (Sadeghi & Hakimi, 2009), whilst others used the split-half test-retest method to ensure good instrument reliability (Jain et al., 2008; Ryalat et al., 2011; Mathabathe, 2007). In this study reliability of data was ensured by double capturing and analysis of the two separate data sets.

c) Bias

This study was subjected to volunteers' bias. Not all the students who were attending the lectures participated in this study. The questionnaires were kept anonymous to minimise preconceptions volunteers may have. Furthermore, the respondents were asked to remain anonymous by not writing their names on the questionnaires. The study was also subjected to some information bias, specifically recall bias and self-report bias. (*Self-report* bias exaggerates symptoms in order to make their situation seem worse or they may under-report the severity or frequency;

whereas *recall bias* might impact the study since the respondents were asked to remember past events. Also some questions were not answered. The errors introduced by both types of bias were minimised by not sampling and thereby including all dental students who consent to take part in the study.

3.7 ETHICAL CONSIDERATION

Approval was obtained from both the School of Healthcare Sciences Research and Ethics Committee and Medunsa Research and Ethics Committee (MREC) prior to this project (*See Appendix 4*). A letter of application for permission to conduct the study (*See Appendix 2*) was written to the Head of the School of Dentistry, at the University of Limpopo (*See Appendix 3*). The letter stated the purpose of the study and made it clear that the study was not obligatory to participants. No financial gains were promised primarily because this is an academic research.

Permission was also obtained from the respondents by including a statement at the top of the questionnaire, that by completing the questionnaire, the respondent is giving informed consent. The names of the respondents were not required on the questionnaires to ensure anonymity. The questionnaires were coded and the information given was kept and used by only the researcher and by no one else and for no other reason. Respondents were also informed that they can withdraw from the study at any time. Those who declined to participate or withdraw were assured that they will not be penalised in any way.

CHAPTER 4:
PRESENTATION OF RESULTS

In Chapter 3 we discussed the research methodology in which the process and tools of collecting data was detailed. In this chapter we reveal the response rate resulting from the study and its population, the demographic characteristics and in depth results, addressing the four objectives of the study from Sub-section 4.3 to 4.6.

4.1 RESPONSE RATE

A total of 139 questionnaires were distributed to third, fourth and fifth year dental students. Only 120 were returned, giving a response rate of 86% (120/139). All 120 were analysed for demographics, objectives one, two, three and four.

4.2 DEMOGRAPHIC CHARACTERISTICS

The demographic information is summarised in figures 4.2.1 to 4.2.7. The mean age was 25.85 years (SD 3.9 years). Most (44.9% [53/118]) of the participants were within the age range of 25-29 years old (*Figure 4.2.1*) and most were females (50.83% [61/120]) (*Figure 4.2.2*). Fourth year dental students represented a large number (39.2%) (*Figure 4.2.4*) of the study population as compared to the third and fifth year dental students. The majority 79.2% (95/120) (*Figure 4.2.3*) were black and 36.13% (43/119) (*Figure 4.2.5*) of the participants resided in urban areas and 55.8% (67/120) (*Figure 4.2.6*) had no previous training in HIV/AIDS. Most of the participants (43.7% [52/119]) (*Figure 4.2.7*) said a degree of dental science will be their first tertiary qualification, whilst 41.18% (49/119) (*Figure 4.2.7*) of the participants have had a tertiary degree(s). Below are some of the figures that explain the above-mentioned:

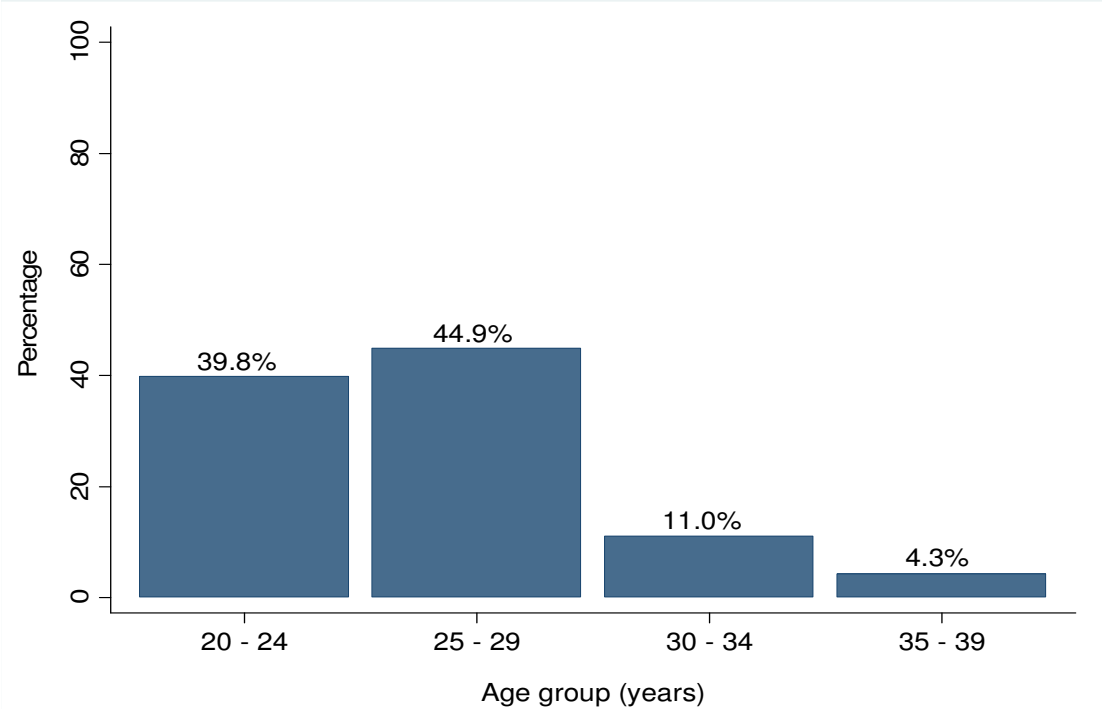

Figure 4.2.1: ***Age group distribution of participants (n=118)***

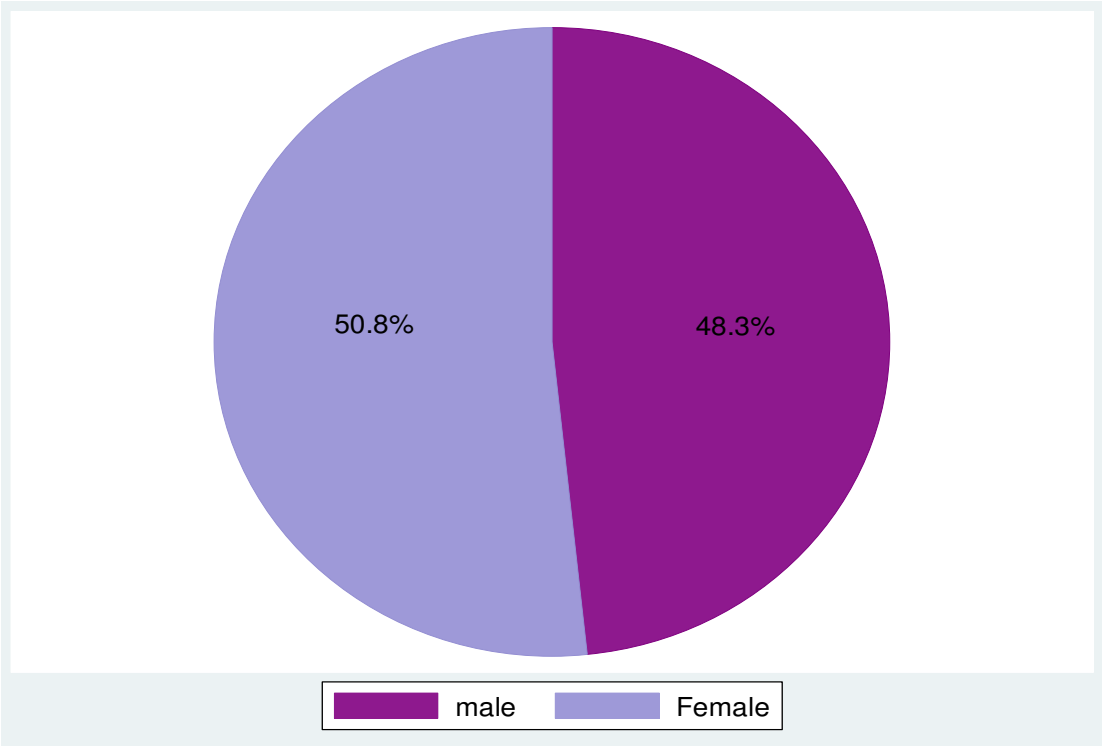

Figure 4.2.2: ***Gender distribution of participants (n=120)***

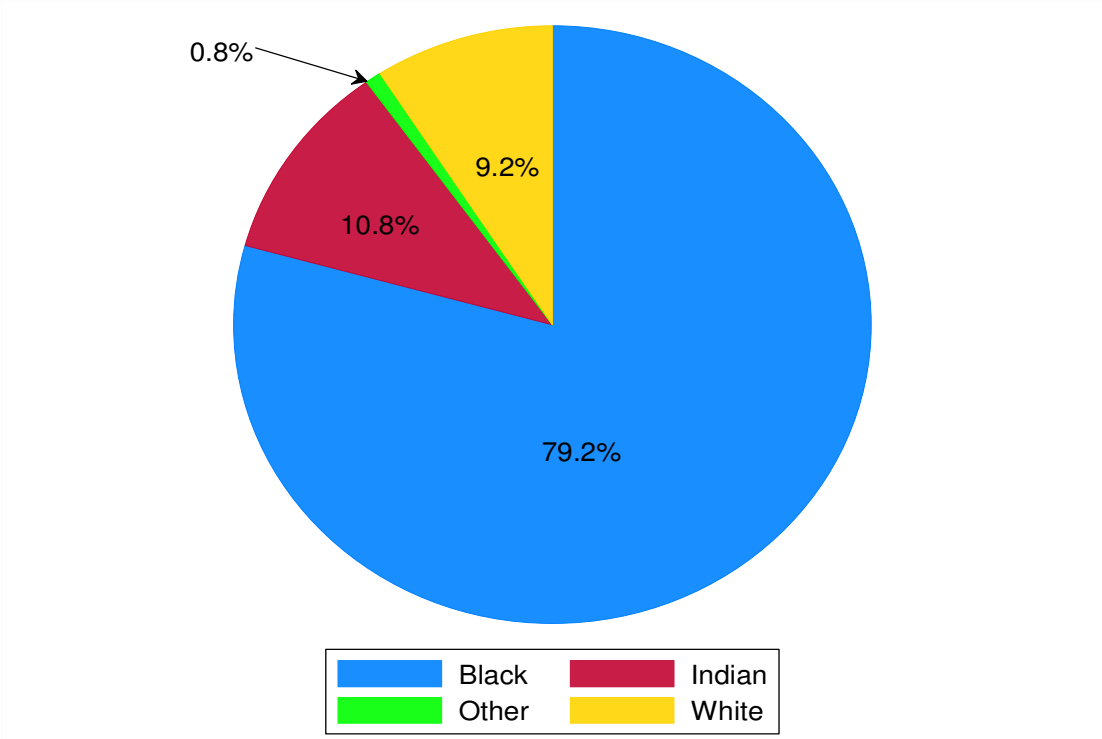

Figure 4.2.3: ***Student distribution according to their ethnic groups (n=120)***

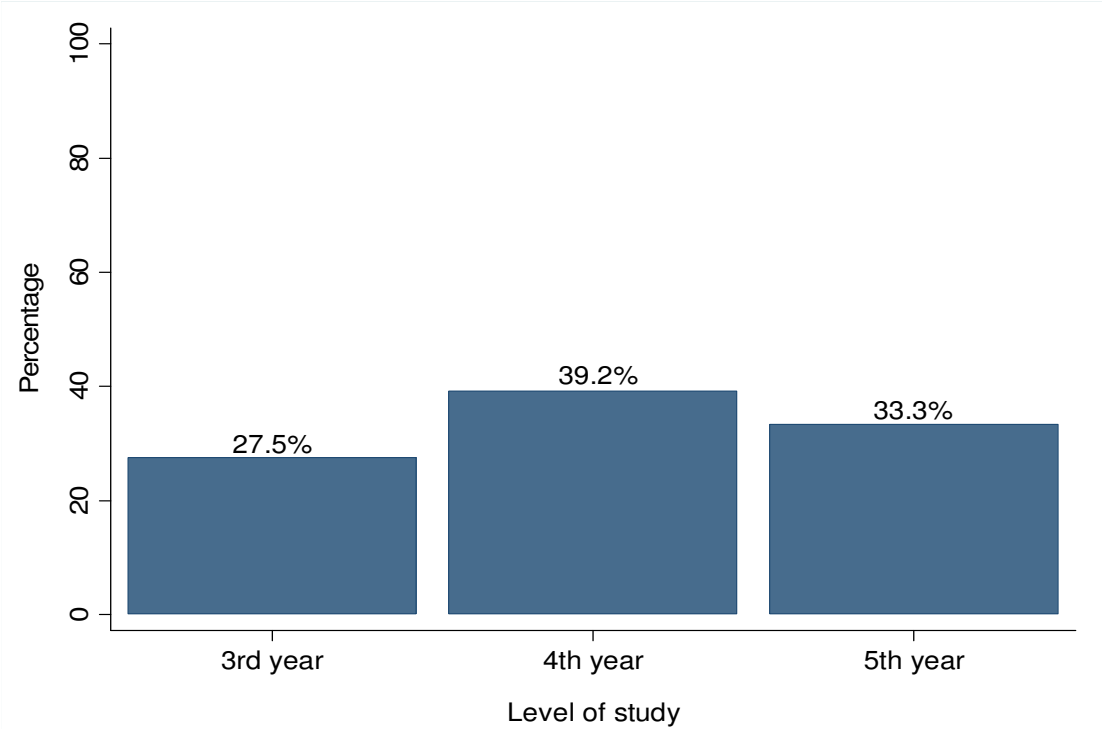

Figure 4.2.4: ***Student distribution according to their levels of studies (n=120)***

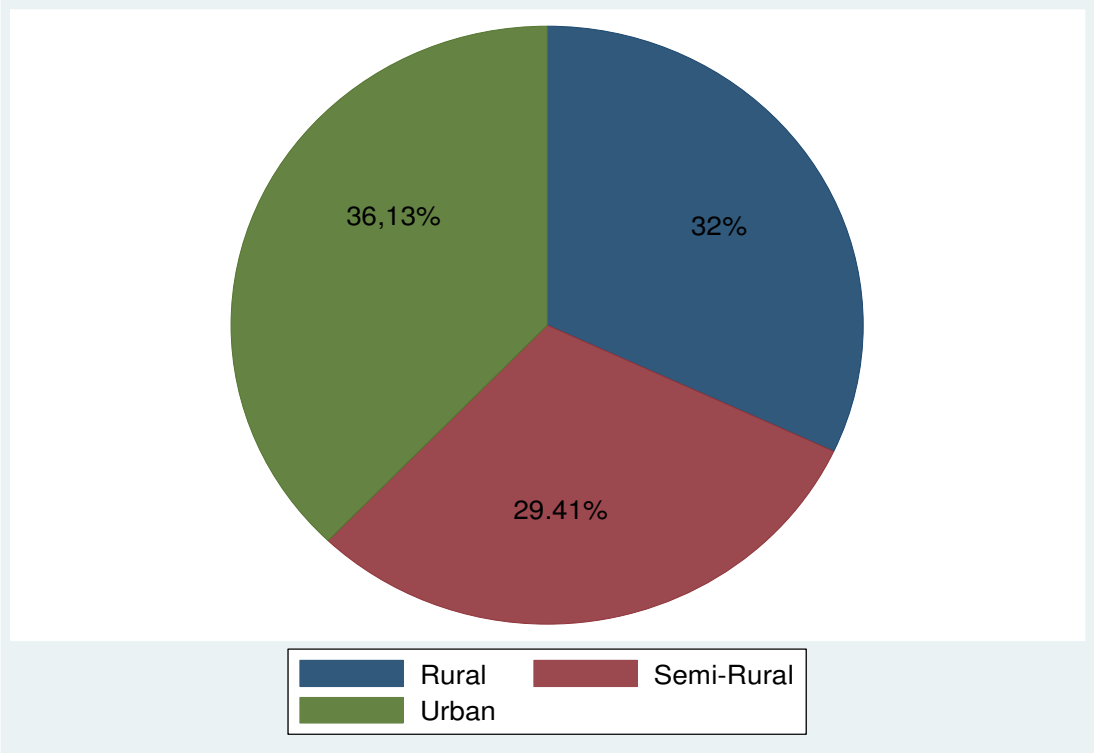

Figure 4.2.5: ***Student distribution according to their areas of residence (n=119)***

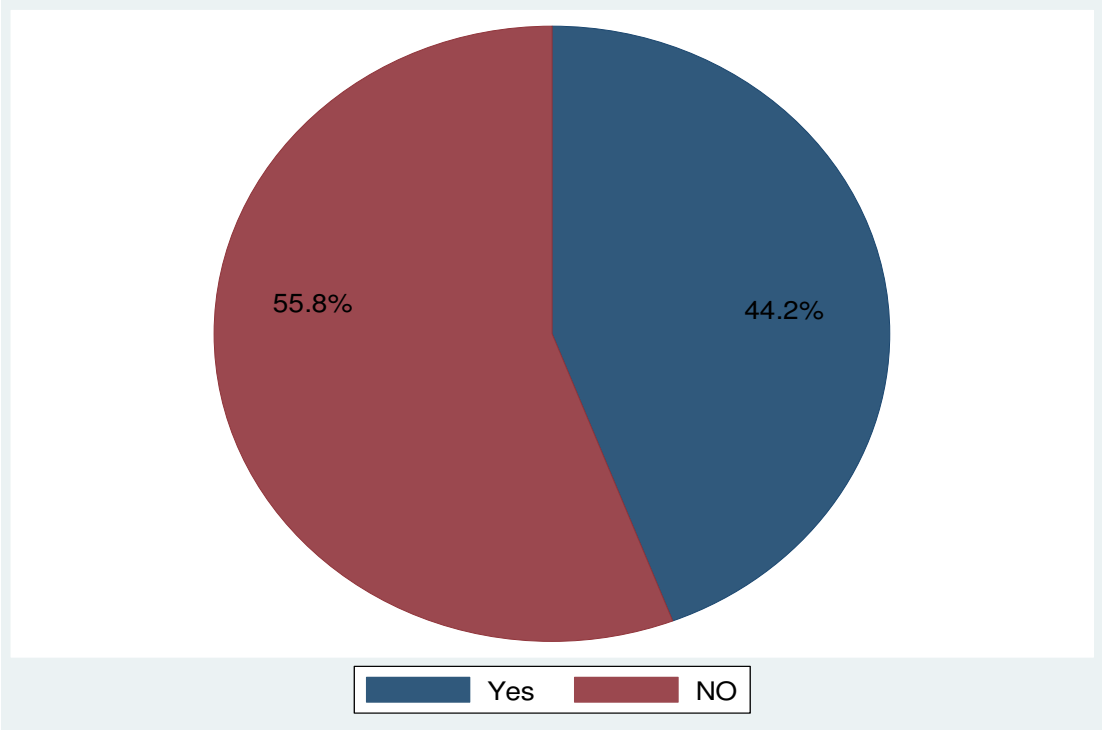

Figure 4.2.6: ***Student distribution according to their previous training in HIV/AIDS (n=120)***

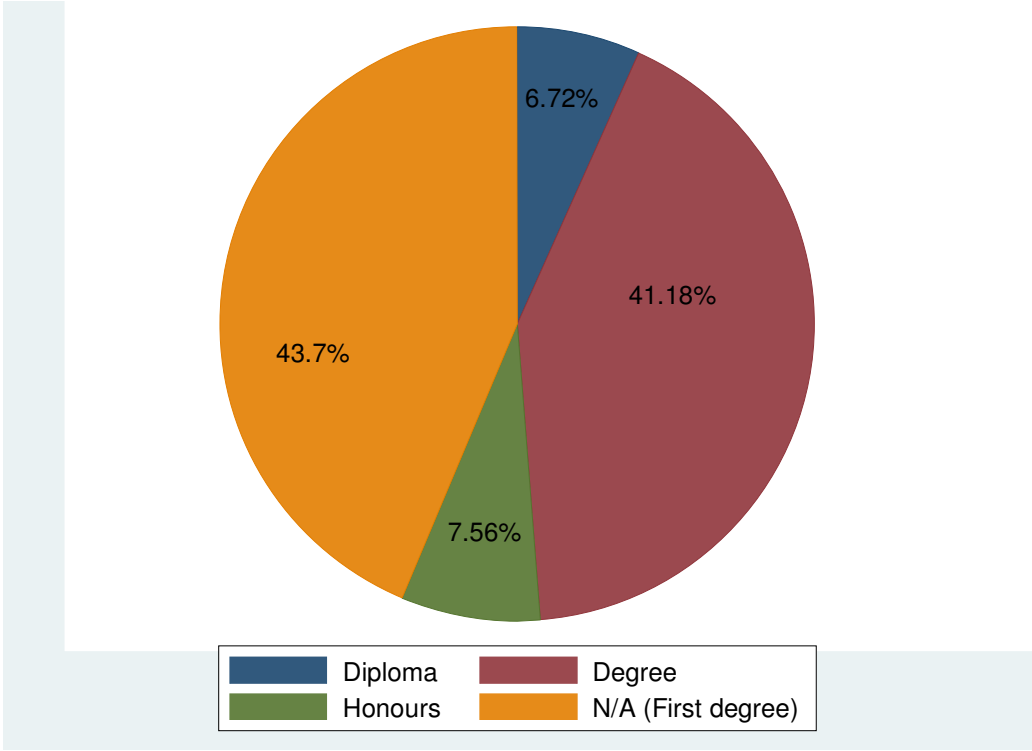

Figure 4.2.7: *Student distribution according to their Previous tertiary qualifications (n=119)*

4.3 OBJECTIVE 1: KNOWLEDGE ABOUT HIV/AIDS

The first research objective in this study was to assess the general and oral health specific knowledge of third, fourth and fifth year dental students on HIV and AIDS. There were ten questions on general and oral health specific knowledge about HIV/AIDS. The first five questions, *agree* was the correct answer and for the last five questions *disagree* was the correct answer. Two (2) points were allocated for every correct answer. One (1) point was allocated for the incorrect answer and *not sure* was given a zero (0). For the 10 questions in this section, the total was 20 marks (2x10) for the ideal scenario which is equivalent to 100%. Excellent knowledge was defined as a score ≥75% and good knowledge was defined as a score between 74%-50%. Moderate knowledge was defined as a score 49%-25% and poor knowledge was defined as a score <25%. The possible range was 1 to 20.

The majority (79.2% [95/120]) (*Figure 4.2.3*) of participants were black students and the rest were collapsed into one group as non-blacks or others. The average mean score was 15.07 (SD 2.48) and the median has reasoned to 16 *(data not shown)*. Few of the participants (3.3% [4/120]) answered all ten questions correctly (*Table 4.3.1*). There was a statistically insignificant difference among all other demographic variables of participants, in term of mean levels of knowledge towards HIV/AIDS except for gender. Gender was statistically significant towards knowledge and females were more knowledgeable about HIV/AIDS as compared to males (p=0.058) (*Table 4.3.2*) (*Table 4.3.3*).

Table 4.3.1: ***Responses of dental students to questions relating to knowledge of HIV/AIDS infection, Medunsa Oral Health Centre, 2012***

		Year of study						Total	
		3rd year		4th year		5th year			
		N	%	N	%	N	%	N	%
Persistent generalised lymphadenopathy is associated with stage 2 of HIV infection	*Not sure*	17	53.1	8	18.6	3	7.5	28	24.3
	Agree	14	43.8	32	74.4	36	90.0	82	71.3
	Disagree	1	3.1	3	7	1	2.5	5	4.3
HIV increases other infections including oral infections as well	*Not sure*	33	100.0	46	97.9	39	97.5	118	98.3
	Agree	0	0.0	1	2.1	1	2.5	2	1.7
	Disagree	0	0.0	0	0.0	0	0.0	0	0.0
Dental clinician can contract HIV from an eye splash incidents during dental treatment	*Not sure*	2	6.1	10	21.3	9	23.1	21	17.6
	Agree	25	75.8	32	68.1	25	64.1	82	68.9
	Disagree	6	18.2	5	10.6	5	12.8	16	13.4
Dental clinician should take Post exposures prophylaxis within 72hours during an eye splash incidents to prevent HIV	*Not sure*	7	21.2	8	17.4	6	15.8	21	17.9
	Agree	21	63.6	35	76.1	27	71.0	83	70.9
	Disagree	5	15.2	3	6.5	5	13.2	13	11.1
Oral Kaposi Sarcoma is virtually exclusive to HIV infection	*Not sure*	9	27.3	0	0.0	2	5.0	11	9.2
	Agree	12	36.4	26	56.5	10	25.0	48	40.3
	Disagree	12	36.4	20	43.5	28	70.0	60	50.4
Antiretroviral drugs can cure HIV infection	*Not sure*	0	0.0	0	0.0	0	0.0	0	0.0
	Agree	0	0.0	1	2.1	0	0.0	1	0.8
	Disagree	33	100.0	46	97.9	40	100.0	119	99.2
Oral Candidiasis is virtually exclusive to HIV infection	*Not sure*	4	12.1	0	0.0	1	2.5	5	4.2
	Agree	7	21.2	15	31.9	8	20.0	30	25.0
	Disagree	22	66.7	32	68.1	31	77.5	85	70.8
Cough/sneeze droplets can transmit HIV	*Not sure*	2	6.1	4	8.5	3	7.5	9	7.5
	Agree	0	0.0	1	2.1	1	2.5	2	1.7
	Disagree	31	93.9	42	89.4	36	90.0	109	90.8
Kissing with exchange of saliva with HIV positive and AIDS people can transmit HIV	*Not sure*	3	9.1	6	13.0	3	7.5	12	10.1
	Agree	3	9.1	29	63.0	5	12.5	37	31.1
	Disagree	27	81.8	11	23.9	32	80.0	70	58.8
Xerostomia is virtually exclusive to HIV infection	*Not sure*	5	15.1	7	15.2	3	7.5	15	12.6
	Agree	6	18.2	7	15.2	2	5.0	15	12.6
	Disagree	22	66.7	32	69.6	35	87.5	89	74.8

Table 4.3.2: ***Comparison of mean age in relation to knowledge of HIV/AIDS infection, Medunsa Oral Health Centre, 2012***

Knowledge [P. correlation]	
Age	**P-value**
0.109	P= 0.241

Table 4.3.3: ***Comparison of means of other demographic variables in relation to knowledge of HIV/AIDS infection, Medunsa Oral Health Centre, 2012***

knowledge				
Gender [t-test]	**N**	**Mean**	**Std. dev.**	**F-value / P-value**
Males	58	14.62	2.60	
Females	62	15.48	2.35	
Total	120	15.07	2.50	**P=0.058**
Ethnic Group [t-test]	**N**	**Mean**	**Std. dev.**	
Black	95	14.93	2.54	
Non-black White	25	15.6	2.31	
Total	120	15.07	2.50	P=0.232
Level of study	**N**	**Mean**	**Std. dev.**	
BDS3	33	14.55	2.36	
BDS4	47	15.06	2.94	
BDS5	40	15.5	1.96	F=1.33
Total	120	15.07	2.50	P=0.270
Area of residence	**N**	**Mean**	**Std. dev.**	
Rural	38	14.89	2.36	
Semi-rural	36	14.5	2.72	
Urban	45	15.69	2.37	F=2.45
Total	119	15.08	2.51	**P=0.090**
Previous training on HIV/AIDS [t-test]	**N**	**Mean**	**Std. dev.**	
Yes	53	15.17	0.35	
No	67	14.98	0.30	
Total	120	15.07	0.23	P=0.689
Highest qualification [Anova]	**N**	**mean**	**Std. dev.**	
Diploma	8	16	3.02	
Degree	50	15.32	2.27	
Honours	9	14.22	3.80	
N/A (Matric)	52	14.22	2.39	F=1.01
Total	119	15.08	2.51	P=0.390

4.4 OBJECTIVE 2: ATTITUDES TOWARDS TREATING HIV-POSITIVE AND AIDS PATIENTS

The second objective was to determine the attitudes of third, fourth and fifth year dental students towards treating HIV-positive and AIDS patients. There were ten questions on general attitude towards treating HIV-positive and AIDS patients in the questionnaire. The first two questions, *disagree* answer indicated a positive attitude and it was allocated +01 point. Question three, *agree* answer indicated a positive attitude and it was allocated +01 point. Question four to six, *disagree* answer indicated a positive attitude and it was allocated +01 point. Question seven to nine, *agree* answer indicated a positive attitude and it was allocated +01 point.

In the last question, *disagree* answer indicated a positive attitude and it was allocated +01. For all the answers that indicated a negative attitude were allocated -01 point and *not sure* was allocated 0 point. For the 10 questions in this section, the total was 10 marks (1x10) for the ideal scenario which is equivalent to 100%. Positive attitude was defined as a score ≥75% and negative attitude was defined as ≤74%. The possible range was -10 to 10. The majority (79.2% [95/120]) (*Figure 4.2.3*) of participants were black students and the rest were collapsed into one group as non-blacks or others. The average mean score 6.89 (SD 3.19) and the median was 08 *(data not shown)*. Fewer participants (26.6% [32/120]) answered all ten questions adequately (*Table 4.4.1*).

There was a statistically insignificant difference among other the demographic variables of participants, in terms of mean levels of attitude towards HIV/AIDS infected people, except for ethnic group. There was a statistically significant difference among participants from different ethnic groups, in terms of mean levels of attitude towards HIV/AIDS infected people. Black participants obtained high positive attitude towards HIV/AIDS infected people, than the rest of the groups (p=0.006) (*Table 4.4.2) (Table 4.4.3).*

Table 4.4.1: ***Responses of dental students to questions relating to attitude, when dealing with HIV/AIDS infected patients, Medunsa Oral Health Centre, 2012***

		Year of study						Total	
		3rd year		4th year		5th year			
		N	%	N	%	N	%	N	%
I will get HIV from treating an HIV+/ AIDS patient	*Not sure*	4	12.1	0	0	0	0.0	4	3.4
	Agree	2	6.1	1	2.2	0	0.0	3	2.5
	Disagree	27	81.8	44	97.8	40	100.0	111	94.1
Handling HIV+/ AIDS patients is too time consuming	*Not sure*	1	3.0	1	2.2	1	2.5	3	2.5
	Agree	3	9.1	1	2.2	1	2.5	5	4.2
	Disagree	29	87.9	44	95.6	38	95.0	111	93.3
I can volunteer to provide my services for AIDS specialty centre	*Not sure*	4	12.1	6	13.6	5	12.5	15	12.8
	Agree	25	75.8	34	77.3	33	82.5	92	78.6
	Disagree	4	12.1	4	9.1	2	5.0	10	8.5
I will double my gloves if I am treating an HIV+/ AIDS patient	*Not sure*	2	6.1	2	4.4	1	2.6	5	4.2
	Agree	10	30.3	6	13.0	14	35.9	30	25.4
	Disagree	21	63.6	38	82.6	24	61.5	83	70.3
Managing HIV+/AIDS patients is a waste of government's resources	*Not sure*	0	0.0	0	0.0	0	0.0	0	0.0
	Agree	1	3.0	2	4.3	0	0.0	3	2.5
	Disagree	32	97.0	44	95.7	40	100.0	116	97.5
HIV+/AIDS patients should not be allowed to conceive	*Not sure*	3	9.1	2	4.4	1	2.5	6	5.0
	Agree	5	15.1	7	15.2	7	17.5	19	16.0
	Disagree	25	75.8	37	80.4	32	80.0	94	79.0
I am not obligated to treat HIV+/AIDS patients	*Not sure*	5	15.2	3	6.8	2	5.0	10	8.5
	Agree	4	12.1	11	25.0	5	12.5	20	17.1
	Disagree	24	72.7	30	68.2	33	82.5	87	74.4
I will perform a emergency resuscitation (CPR) if an HIV+/AIDS patients need it	*Not sure*	7	21.2	6	13.3	6	15.0	19	16.1
	Agree	20	60.6	34	75.6	33	82.5	87	73.7
	Disagree	6	18.2	5	11.1	1	2.5	12	10.2
I am morally responsible to treat HIV+/AIDS patients	*Not sure*	0	0.0	2	4.4	0	0.0	2	1.7
	Agree	31	93.9	41	89.1	40	100.0	112	94.1
	Disagree	2	6.1	3	6.5	0	0.0	5	4.2
HIV+/AIDS patients should be isolated from the entire community	*Not sure*	1	3.0	2	4.4	0	0.0	3	2.5
	Agree	1	3.0	3	6.5	0	0.0	4	3.4
	Disagree	31	94.0	41	89.1	40	100.0	112	94.1

Figure: 4.4.2: ***Comparison of mean age in relation to attitude when dealing with HIV/AIDS infected patients, Medunsa Oral Health Centre, 2012***

Attitude [P. correlation]	
Age	**p-value**
0.130	**0.160**

Figure 4.4.3: ***Comparison of means of other demographic variables in relation to attitude when dealing with HIV/AIDS infected patients, Medunsa Oral Health Centre, 2012***

Attitude				
Gender [t-test]	**N**	**Mean**	**Std. dev.**	**F-value / P-value**
Males	58	7.36	2.31	
Females	62	6.45	3.83	
Total	120	6.89	3.20	**P=0.113**
Ethnic Group[t-test]	**N**	**Mean**	**Std. dev.**	
Black	95	7.29	0.28	
Non-black	25	5.36	0.39	
Total	120	6.89	3.20	**P=0.006**
Level of study	**N**	**Mean**	**Std. dev.**	
BDS3	33	6.06	3.33	
BDS4	47	6.81	3.62	
BDS5	40	7.65	2.36	F=2.38
Total	120	6.89	3.20	**P=0.098**
Area of residence	**N**	**Mean**	**Std. dev.**	
Rural	38	7.37	2.27	
Semi-rural	36	6.31	4.25	
Urban	45	6.91	2.91	F=1.02
Total	119	6.87	3.21	P=0.365
Previous training on HIV/AIDS [t-test]	**N**	**Mean**	**Std. dev.**	
Yes	53	6.74	3.96	
No	67	7.01	2.47	
Total	120	6.89	3.20	P=0.638
Highest qualification	**N**	**Mean**	**Std. dev.**	
Diploma	8	6.75	1.83	
Degree	50	6.82	4.09	
Honours	9	7.44	3.04	
N/A (Matric)	52	6.83	2.38	F=0.10
Total	119	6.86	3.19	P=0.957

4.5 OBJECTIVE 3: STUDENTS PRACTICES

The third research objective in this study was to describe the practices followed by third, fourth and fifth year dental students who treat HIV-positive and AIDS patients. There were ten questions to describe the practices followed by third, fourth and fifth year dental students. Their practices were described using the following: *never*, *always*, *sometimes* and *not sure*. *Never* was allocated 0. *Always* was allocated 03. *Sometimes* allocated 02 and *not sure* was allocated 01. For the ten questions in this section, the total was 30 marks (3x10) for the ideal scenario, which equalled to 100%.

Excellent practice was defined by a score ≥75%. Good practice was defined as a score between 74%-50%. Moderate practice was defined as a score between 49%-25% and Poor practices were defined by a score <25%. The possible range was 0 to 30. The majority (79.2% [95/120]) (*Figure 4.2.3*) of participants were black students and the rest were collapsed into one group as non-blacks or others. The mean score was 28.38 (SD 3.18) and the median was 29. More than a quarter of the participants (42.5% [51/120]) answered all ten questions satisfactorily (*Table 4.5.1*). There was a statistically insignificant difference among all the demographic variables of participants, in terms of mean levels of practice towards HIV/AIDS (*Table 4.5.2*) (*Table 4.5.3*).

Table 4.5.1: ***Responses of dental students to questions relating to practice when dealing with HIV/AIDS infected patients, Medunsa Oral Health Centre, 2012***

		Year of study							
		3rd year		4th year		5th year		Total	
		N	%	N	%	N	%	N	%
Personal protective clothing before treating patients	*Always*	31	93.9	45	97.8	38	95	114	95.8
	Sometimes	2	6.1	1	2.2	2	5	5	4.2
	Not sure	0	0	0	0	0	0	0	0.0
	Never	0	0	0	0	0	0	0	0.0
Disinfect working surfaces before treating patients	*Always*	30	90.9	40	87.0	38	97.4	108	91.5
	Sometimes	3	9.1	6	13.0	1	2.6	10	8.5
	Not sure	0	0	0	0.0	0	0	0	0.0
	Never	0	0	0	0.0	0	0	0	0.0
Sterilization of hand pieces after use	*Always*	31	96.9	45	97.8	39	97.5	115	97.5
	Sometimes	1	3.1	1	2.2	1	2.5	3	2.5
	Not sure	0	0.0	0	0.0	0	0.0	0	0.0
	Never	0	0.0	0	0.0	0	0.0	0	0.0
Thorough washing of hands before treating patients	*Always*	22	66.7	26	56.5	28	70.0	76	63.9
	Sometimes	11	33.3	20	43.5	10	25.0	41	34.5
	Not sure	0	0.0	0	0.0	0	0.0	0	0.0
	Never	0	0.0	0	0.0	2	5.0	2	1.7
Change gloves in between patients	*Always*	31	93.9	45	97.8	40	100.0	116	97.5
	Sometimes	2	6.1	1	21.2	0	0.0	3	2.5
	Not sure	0	0.0	0	0.0	0	0.0	0	0.0
	Never	0	0.0	0	0.0	0	0.0	0	0.0
Wash hands after treating patients	*Always*	26	78.0	43	93.5	37	92.5	106	89.1
	Sometimes	7	21.2	3	6.5	2	5.0	12	10.1
	Not sure	0	0.0	0	0.0	0	0.0	0	0.0
	Never	0	0.0	0	0.0	1	2.5	1	0.8
Disinfect light handles before treating patients	*Always*	28	84.9	37	80.4	30	75.0	95	79.8
	Sometimes	5	15.1	9	19.6	9	22.5	23	19.3
	Not sure	0	0.0	0	0.0	0	0.0	0	0.0
	Never	0	0.0	0	0.0	1	2.5	1	0.8
Immediate disposing of used injecting needles after treating patients	*Always*	31	93.9	44	95.7	36	90.0	111	93.3
	Sometimes	2	6.1	2	4.3	4	10.0	8	6.7
	Not sure	0	0.0	0	0.0	0	0.0	0	0.0
	Never	0	0.0	0	0.0	0	0.0	0	0.0
Flash suction pipes in between patients	*Always*	25	75.8	36	78.3	29	72.5	90	75.6
	Sometimes	8	24.2	8	17.4	10	25.0	26	21.8
	Not sure	0	0.0	0	0.0	0	0.0	0	0.0
	Never	0	0.0	2	4.3	1	2.5	3	2.5
Autoclave dental instruments after treating patients	*Always*	31	93.9	45	97.8	38	95.0	114	95.8
	Sometimes	2	6.1	1	2.2	1	2.5	4	3.4
	Not sure	0	0.0	0	0.0	1	2.5	1	0.8
	Never	0	0.0	0	0.0	0	0.0	0	0.0

Figure 4.5.2: ***Comparison of mean age in relation to infection control practice when dealing with HIV/AIDS infected patients***

Practice [P. correlation]	
Age	**p-value**
0.046	0.622

Figure 4.5.3: ***Comparison of means of other demographic variables in relation to infection control practice when dealing with HIV/AIDS infected patients***

Practice				
Gender [t test]	**N**	**mean**	**Std. dev.**	**F-value / P-value**
Males	58	28.44	2.21	
Females	62	28.32	3.91	
Total	120	28.38	3.19	P=0.831
Ethnic Group[t test]	**N**	**Mean**	**Std. dev.**	
Black	95	28.53	1.89	
Non- Black	25	27.84	6.02	
Total	120	28.38	3.20	P=0.342
Level of study	**N**	**mean**	**Std. dev.**	
BDS3	33	28.61	2.15	
BDS4	47	28.13	4.50	
BDS5	40	28.5	1.84	F=0.25
Total	120	28.38	3.19	P=0.776
Area of residence	**N**	**mean**	**Std. dev.**	
Rural	38	28.24	2.04	
Semi-rural	36	28.28	2.22	
Urban	45	28.58	4.48	F=0.14
Total	119	28.38	3.21	P=0.870
Previous training on HIV/AIDS [t test]	**N**	**mean**	**Std. dev.**	
Yes	53	27.87	4.36	
No	67	28.79	1.75	
Total	120	28.38	3.19	**P=0.117**
Highest qualification	**N**	**mean**	**Std. dev.**	
Diploma	8	28.25	1.28	
Degree	50	28.08	4.52	
Honours	9	27.89	3.02	
N/A (Matric)	52	28.75	1.49	F=0.44
Total	119	28.37	3.21	P=0.722

4.6 OBJECTIVE 4: RELATIONSHIP BETWEEN KNOWLEDGE, ATTITUDE AND PRACTICES

The fourth objective was to determine if there was a relationship between knowledge, attitude and practices of third, fourth and fifth year dental students regarding HIV-positive and AIDS patients. Gender, areas of residence, attitude and practice were statistically significantly associated with knowledge at 0.1 level of significance (*Table 4.3.2*) (*Table 4.3.3*) (*Table 4.6.1*). Multiple regression analysis modelling was used to calculate regression coefficients between the aforesaid and the outcome knowledge. Gender and practice were found to be significant predictors of knowledge regarding HIV/AIDS (p=0.046) (p=0.046). Females are more knowledgeable about HIV/AIDS than males, whilst an increase in knowledge yields excellent infection control practices (or=1.07) (p=0.046) (*Table 4.6.2*).

Age, gender, ethnic groups, levels of study, knowledge and practice were statistically significantly associated with attitude at 0.1 level of significance (*Table 4.4.2*) (*Table 4.4.3*) (*Table 4.6.1*). Multiple regression analysis modelling was used to calculate regression coefficients between the aforesaid and the outcome attitude. Ethnic groups and levels of study (BDS4 & BDS5) were found to be significant predictors of attitude regarding HIV-positive patients (p=0.001) (BDS4, p=0.055) (BDS5, p=0.001) (*Table 4.6.3*). Non-black dental students have a negative attitude towards HIV/AIDS positive patients (or=0.89) (p=0.001). Further analysis shows that BDS4 students are 1.20 times more likely to have a positive attitude than BDS3 students. BDS5 students are 1.38 times likely to have a positive attitude than BDS3 students (p=0.055) (p=0.001) (*Table 4.6.3*).

Previous training in HIV/AIDS, knowledge and attitude were statistically significantly associated with practice at 0.1 level of significance (*Table 4.5.2*) (*Table 4.5.3*) (*Table 4.6.1*). Multiple regression analysis modelling was used to calculate regression coefficients between the aforesaid and the outcome practice. Attitude was found to be a significant predictor of practice (p=0.012) (*Table 4.6.4*). Pearson's correlation

coefficient showed students with positive attitude scores had significantly excellent practice regarding HIV/AIDS (r=0.2912) (p=0.001) (*Table 4.6.1*).

Table 4.6.1: ***Correlation outcomes between knowledge, attitude and practice***

P. Correlation (r)	**Knowledge**	**Attitude**	**Practice**
Knowledge	1.0000		
Attitude	0.1468 **P=0.108**	1.0000	
Practice	0.1629 **P=0.074**	0.2912 **P=0.001**	1.0000

Table 4.6.2: ***Multiple regression output of predictors for knowledge***

Knowledge	**OR (odd ratio)**	**P-value**
Gender	1.07	0.046
Practice	1.01	0.046

Table 4.6.3: ***Multiple regression output of predictors for attitude***

Attitude	**OR (odd ratio)**	**P-value**
Ethnic group	0.89	0.001
Level of study BDS 4	1.20	0.055
BDS 5	1.38	0.001

Table 4.6.4: ***Multiple regression output of predictors for practice***

Practice	**OR (odd ratio)**	**P-value**
Attitude	1.01	0.012

CHAPTER 5:
DISCUSSIONS AND CONCLUSION

In this chapter we further discuss and criticise the results for knowledge, attitude and practices of dental students as studied. We conclude and give recommendations in Sub-section 5.5.

5.1 KNOWLEDGE ON HIV/AIDS

Overall respondents of this study illustrate sound knowledge on the general and oral health specific knowledge on HIV/AIDS*,* with a mean score of 15.07 (SD 2.48) and the range of 01 to 20 and the median at 16 *(data not shown)*. However, it was not without common misconceptions which became worrisome. Knowledge was tested on oral manifestation, mode of transmission and general understanding of HIV/AIDS.

More than half of students at the University of Peradeniya (UP), Sri Lanka and dental students from Kuwait University (KU) recognised even the common HIV-associated oral lesions such as necrotizing gingivitis, oral candidiasis and Kaposi Sarcoma (Ellepola, Sundaram, Jayathilake, Joseph & Sharma, 2011). In this particular study, 53.1% of third year dental students were not sure whether *persistent generalised lymphadenopathy* is associated with stage 02 of HIV infection, whilst *cervical lymphadenopathy, oral candidiasis and gingivitis* are the most common soft tissues of oral lesions with 60.8%, 28.3% and 19.0% respectively (Rwenyonyi et al., 2011). This was quite disturbing because 100%, 97.9% and 97.5% of third, fourth and fifth year dental students, respectively, were not sure if HIV increases other infections including oral infections according to this study.

This is consistent with a study conducted on Nigerian dental students paying a particular attention to their willingness to treat HIV-positive patients. Most (81%) of the students showed great interest in receiving HIV-related information and 82.7% desired to acquire more knowledge on safety precautions during treatment of HIV-positive and AIDS patients (Azodo et al., 2010a). This indicates that there is a lack of

knowledge and understanding regarding how the HIV is transmitted and progresses in one's immune system. The exposure of dental students to a wide range of HIV-positive and AIDS patients may broaden the students' knowledge towards oral manifestations of HIV.

In this study, 70% of the fifth year dental students and 36.4% of the third year dental students together with 43.5% of fourth year dental students said that oral Kaposi Sarcoma is not virtually exclusive to HIV infection. Only 31.9% of the fourth year dental students agreed that oral candidiasis is virtually exclusive to HIV infection. These results are inconsistent with Ajayi & Ajayi (2008) where 83.6% and 48.6% of the final year dental students recognised that *oral Kaposi Sarcoma* and *oral hairy leukoplakia* are virtually exclusive to HIV-positive individuals. *Kaposi Sarcoma, leukoplakia* and *candidiasis* in particular, are three common oral manifestation of HIV in HIV-positive and AIDS patients (Oliveira et al., 2002 and Margiotta, Campisi, Mancuso, Accurso & Abba-dessa, 1999).

It is encouraging that most (70.8%) of MOHC dental students knew that *oral candidiasis* is virtually not exclusive to HIV infection. This indicates a sound knowledge about *oral candidiasis* that is not only common in HIV-positive patients, but the immune state and the oral mucosal environment of person may determine the growth of *Candida* in the mouth. In addition to its role in the diagnosis of HIV infection, oral manifestations of such lesions (i.e. *oral candidiasis*) can be used as an indicator of the progression of HIV infection to AIDS. This is more or less the same to Ajayi & Ajayi (2008) where nearly all students recognised the association of *Kaposi Sarcoma* (100%) oral *candidiasis* (97.1%) and *oral hairy leukoplakia* (97.2%) with HIV-positive patients.

Candidiasis was considered to be only opportunistic infection, affecting individuals who were debilitated by other diseases. However, clinicians recognise that *Candida* may develop in people who are otherwise healthy (Neville, Damm, Allen & Bouquot, 2002). Students should be educated on such lesions like *oral candidiasis* that are

strongly associated with HIV/AIDS, but that are not exclusive to HIV/AIDS (Ryalat et al., 2012).

If adequate precaution is not taken to prevent blood and body fluid contamination, the risk of HIV transmission increases tremendously. Several studies have documented that 70-90% of HIV-positive individuals display common opportunistic oral infections of HIV disease (Azodo et al., 2010a) and also Highly Active Antiretroviral Therapy (HAART) predispose HIV-positive patients to human papilloma virus infection of the mouth (Frezzini, Leao & Porter, 2005).

The possibility of HIV transmission does exist within the dental setting. Two questions on mode of transmission were asked in this study. It was encouraging that more than half (68.9%) of the students knew that dental clinician can contract HIV from an eye splash incidents during dental treatment. This was quite good that dental students were informative about the possibility of contracting HIV from an eye splash incident. Reports of HIV transmission through this mode are rare. It was quite disturbing that 63% of fourth year dental students think that kissing with exchange of saliva with HIV-positive and AIDS people can transmit HIV. More or less similar results were found by Sadeghi & Hakimi (2009), that 75.5% of their respondents believed that saliva can be a vehicle for the transmission of AIDS. Ryalat et al. (2011) reported that, third year dental students in Jordan thought that aerosol containing saliva of HIV-positive patients could transmit HIV infection. Transmission through saliva in the clinic has not yet been reported and this has been explained by the ability of the glandular saliva to inhibit the infectivity of HIV (Seacat & Inglehart, 2003).

In this study, we've discovered specific gender differences of students when dealing with HIV/AIDS. A large proportion of females as compared to males participated in this study, which was a good indication that females are more optimistic about education. Male students have a knowledge mean score of 14.62, whilst females have a knowledge mean score of 15.48 and gender was statistically significant towards knowledge regarding HIV/AIDS ($p=0.058$). This is consistent to Ellepola et

al. (2011) findings that female dental students from Kuwait and Sri-Lanka scored significantly higher than the male students on knowledge about HIV/AIDS (p=0.002). Similar findings were reported by Oliveira et al. (2008) who observed knowledge gender difference among the Brazilian students regarding HIV/AIDS: females have better knowledge than males (p=.005). However, Sadeghi & Hakimi (2009) discovered insignificant differences in the knowledge and attitude score between male and female students amongst the Iranian dental students. Contrary to our findings, previous research surveys on knowledge about HIV/AIDS prevention in 23 developing countries always documented the level of knowledge about HIV/AIDS to be higher amongst males as compared to females (Bezuidenhout & Summers, 2009).

5.2 ATTITUDE ON HIV/AIDS

The knowledge and attitude of oral health care workers in relation to HIV have an influence towards their willingness to care and provide quality dental treatment to HIV positive/AIDS patients. In this study, the attitudes of (third, fourth and fifth year) dental students towards treating HIV-positive/AIDS patients were fairly good with a positive mean score of 6.89 (SD 3.19). The range was -05 to 10 and the median stood at 08 (*data not shown*).

On the whole (93.3%), our dental students disagreed with the saying "*Managing/ handling HIV-positive/AIDS patients is too time consuming"* and a satisfying 97.55% of them also disagreed with the saying "*Managing HIV-positive/AIDS patients is a waste of government's resources*". This is quite motivating as 79% of dental students at the University of Western Cape felt that HIV/AIDS patients should be treated at any dental facility and that these patients are entitled to be treated with the same respect and dignity as other patients (Erasmus et al., 2005 and Ryalat et al., 2011).

It is quite encouraging that 94.1% of dental students in this study disagreed with the statements that states *"I will get HIV from treating an HIV-positive/AIDS patient"*. This is all but uniform to Shaikh et al. (2011) study whereby 90.7% of dental students were willing to treat individuals with HIV/AIDS in Bangalore. Excellent knowledge on HIV/AIDS and positive attitude are the major criteria for one to willingly treat HIV/AIDS patients. This is consistent with Maimaiti et al. (2010) where 86% of the respondents in the University of Xinjiang in China indicated that people with HIV/AIDS are like anyone of them and need their care and support.

Three statements raised some concerns when we elicited information about students' attitudes towards treating HIV-positive and AIDS patients. One part on both third year (30.3%) and fourth year (35.9%) dental students have agreed to double glove their gloves when treating HIV-positive and AIDS patients. This concurs with Jain et al. (2008) study on dental students of Udaipur whereby 45.7% agreed to protect themselves from AIDS by the double glove technique. This is worrying because all patients should be treated with the same infection control measures and be considered for risk of HIV infection (Oliveira et al., 2002). These is similar to Azodo, Umoh, Ezeja & Ukpebor (2007) study among dental nursing students in Nigeria where 87.6% believed extra infection control precaution is needed while treating HIV-positive patients. This response is an obvious revelation of deficiencies in HIV/AIDS knowledge transmission and infection control.

A quarter (25%) of the fourth year dental students in this study indicated that they are not obligated to treat HIV-positive/AIDS patients. Dental students with such an attitude will inevitably provide poor oral care services as future dentists. This is consistent to Sadeghi & Hakimi (2009) study when it was found that 49.7% of Iranian dental students agreed to the statement that says *"I am not obligated to treat HIV/AIDS patients"*. Arjuna, Ellepola, Sundaram, Joseph & Sharma (2010) found similar results when they were comparing knowledge and attitudes about HIV/AIDS of dental students from Kuwait (KU) and Sri Lanka (UP).

A significant number (63.6%) of KU students also mentioned that they have the right to refuse to treat an AIDS patient. HPCSA guidelines state that it is not only unlawful but also unethical for health care providers to refuse treatment to an HIV-infected patient. Only 18.2% of third year students in our study disagreed to perform CPR if an HIV-positive and AIDS patients needed it. On the other hand, 21.2% were not sure whether to perform the CPR or otherwise. This is not consistent with Sadeghi & Hakimi (2009) whereby 0.2% of Iranian dental students agree to the statement "*I will do CPR if HIV/AIDS patients need it*". Arjuna et al. (2010) discovered that almost half of dental students from KU and UP would be willing to perform mouth-to-mouth resuscitation on an AIDS patient in respiratory arrest, 16.4% and 22.5% respectively.

There was a statistically significant difference among participants from different ethnic groups in terms of mean level of attitude towards HIV/AIDS infected people. Black dental students had a high positive attitude towards HIV/AIDS positive patients ($p=0.006$). Although some attitudes are influenced by core values such as integrity, customer orientation, communication and others; adequate knowledge and positive attitude are major criteria for treating HIV/AIDS patients (Shaikh et al., 2011). Ethnicity plays an important role in the delivery of services in one way or the other. MOHC serves most black communities of Garankuwa, Brits, Mabopane and Soshanguve according to its geographical landmark. Dental students at MOHC are working with clients from diverse backgrounds and cultures. Majority of dental students and oral health care workers within MOHC are black people and this has an influence towards their perceptions and responses to patients' oral health problems and treatment. Ethnicity is one of the social factors that influence the behaviour or practice of different individuals.

This is consistent with Ahmed et al. (2009) when evaluating the levels of knowledge, attitudes and risk perceptions at the University of Sains Malaysia's final year of pharmacy students regarding HIV and AIDS and had discovered that ethnicity played major role in the attitudes of the students towards HIV/AIDS. Fewer Malay students in comparison to Chinese students indicated a *preference* to not take care of HIV/AIDS patients. Furthermore, Malay students agreed with the idea of separate

nursing of HIV/AIDS patients than Chinese students (p-value=0.001) (Ahmed et al. (2009). Malaysian-Chinese constitute population has grown from 23.3 million to 28.3 million and is home to the third-largest Chinese community in the world (Malaysia 2012 Census; Malaysia explorer).

The attitude scale in this study did show encouraging results in relation to the levels of study. There was no statistically significant difference in term of mean level attitude towards HIV/AIDS between the different ages and genders. However, there was a statistically significant difference in terms of mean level attitude towards HIV/AIDS among different levels of study (BDS4, p=0.055) (BDS5, p=0.001). A study conducted by Jain et al. (2008) among dental students of Udaipur, India reveals that different year of degree course was a statistically significant to mean level attitude (p=0.028). And second year dental students had better knowledge and attitude in comparison to other students. Contrast to our study, fourth year dental (BDS4) students were 1.20 times more likely to have a positive attitude than third year dental (BDS3) students and final year (BDS5) students were 1.38 times likely to have a positive attitude than BDS3 students (p=0.055) (p=0.001). Significantly higher proportion of third year students compared to fifth year (39.2% v/s 26.3%) thought that HIV/AIDS patients should be referred to other centres or support groups for treatment (p=0.040) (Ryalat et al., 2011). Final year dental students at Oxford Dental College in Bangalore had maximum adequate attitude of 73.3%, based on attitude-legal, personal risk and consequences scale (Shaikh et al., 2011). Adequate knowledge and positive attitude predict the quality of service one has to offer.

5.3 PRACTICES

It is imperative for oral health practitioners to develop adequate knowledge, good clinical skills and positive attitude to diagnose and manage HIV/AIDS patients, as well as to maintain appropriate infection control measures to prevent the transmission of HIV and other blood borne pathogens (Oliveira et al., 2002). Only effective infection control measures in a clinical setting can prevent the spread of

HIV and other highly infectious diseases (Azodo, Ehizelea, Umoh & Ogbrbor, 2010b).

The infection control practices of dental students at the MOHC were found to be adequate with a mean score 28.38 (SD 3.18). The possible range was 0 to 30 and the median reasoned to 29. Azodo et al. (2010a) found that barrier usage is an effective infection control practice and 86.2% of the respondents in Nigeria reported consistency in infection control practices. Whilst in this study 95.8% demonstrated that they are consistent with personal protective clothing before treating patients. Similar findings were reported by Yengopal, Naidoo & Chikte (2001) that there was a routine use of gloves, masks and protective eyewear by dentists of about 97.1%, 82.4% and 52.9% respectively.

The Brazilian students (89.9%) changed their pair of gloves in between patients (Oliveira et al., 2002). In our study 97.5% of the dentals students reported that they always change gloves in between patients. This is parallel to De Kock & Van Wyk (2001) findings in South Africa whereby 88% of oral hygienist reported to be changing their gloves in between patients. To substantiate this, Azodo et al. (2010a) also drew that 89.9% of his respondents proved to have used proper infection barriers, like hand gloves, face masks and others. Most of the clinical dental students rated the teaching they received on cross infection precautions and barrier in dentistry as adequate or more than adequate (Ryalat et al., 2011).

As part of its environmental infection control measures, CDC (2003) states *"use surface barriers to protect clinical contact surfaces particularly those that are difficult to clean (e.g. switches on dental chairs) and change surface barriers between patients"*. In this study, *"disinfecting light handles before treating patients, immediate disposing of used injecting needles after treating patients, flashing suction pipes in between patients",* dental students rated themselves to be adhering to this practise always with percentages of 79.8, 93.3, 75.6 and 95.8 respectively. More or less results were found by Mathabathe (2006) whereby oral health care workers reported percentages of 86.5, 86.9, 60.3 and 94.1 respectively. In accordance to this, most

(79.8%) Brazilian students disinfected light handles before treating patients (Oliveira et al. 2002). Yengopal et al. (2001) discovered that 89.7% of dentists in South Africa have had autoclave sterilisation machines in their practise and it is a motivating fact that 95.8% of dentals students in this study always autoclave dental instruments after treating patients.

Our study outlined good infection control practices. However, some important practices items deserve comments. Our third year (33.3%), fourth year (43.5%) and fifth year (25%) dental students reported that sometimes they thoroughly wash their hands before treating patients. Only 21.2% of the fourth year dental students do change gloves only sometimes in between patients. Also 22% of the fifth year dental students disinfected light handles before treating patients. Also 24.2% of third year dental students and 25% of fifth year dental students sometimes flash suction pipes in between patients. Universal precautions is a philosophy that considers all patients to be infected with pathogenic organisms and thus maintains that certain basic infection control procedures are adhered to when treating patients (Palenik, Trevover, Biurke & killers, 2000).

This is consistent with infection control practices of dental and oral hygiene students at the University of Western Cape whereby 31% of the respondents reported to be using gloves, masks and protective eyewear as part of their barrier techniques. The response rate on the use of eye protection was 49% for both dentistry students and oral hygiene students (Erasmus et al., 2005). Comparable results were reported by Mehtar et al. (2007) in one of South African province where there was lack of protective eyewear during a dental procedure, not washing of hands between patients, not disassembling an item prior to disinfection or sterilization and of not using a sterile drill for each patient were identified amongst oral health care workers.

Several studies have shown that knowledge about HIV/AIDS alone does not change behaviours among various students population. Also, nursing, dental, medical and pharmacy undergraduate students does not emulate positive attitude towards HIV-positive and AIDS patients (Jain et al., 2008; Ahmed et al., 2009; Maimaiti et al.,

2010; Ryalat et al., 2011). To carry out effective clinical management, dental students need to be aware and understand the significance of willingness to treat patients with HIV/AIDS. Effective clinical management is also related to knowledge of the disease, disease progress, recognition of oral manifestation and understanding of modes of transmission (Cohen et al., 2005; Sadeghi & Hakimi, 2009). In this study dentals students' practice was significant predictor towards knowledge, whereby an increase in knowledge about HIV/AIDS resulted in excellent infection control practices (p=0.046).

Whilst attitude was significant predictor towards practice (p=0.012), increased knowledge and positive attitude towards issues concerning HIV have led to dental professionals increased willingness to treat HIV positive patients. However, Khosravanifard, Rakhshan, V., Ghasemi, Pakdel, Eghbal, Sheikholeslami, Dadolahi-sarab & Rakhshan, H. (2012) discovered that amongst Tehran dentists there was insignificant correlations between dentists' knowledge and attitude (r=0.102) (p=0.077) or between knowledge and behaviour (r=0.008) (p=0.367). Consistent to our findings, a significant (but weak) positive correlation was found between attitude and observed behaviour (r=0.379) (p=0.02) (Khosravanifard et al., 2012). The dental students in this study had a significant (but weak) positive correlation between attitude and observed behaviour (r=0.2912) (p=0.001). In contrast to our findings, Sadeghi & Hakimi (2009) revealed that students with higher knowledge scores had significantly more positive attitude towards HIV/AIDS patients (r=0.247) (p=0.001). The health belief model illustrates that factors such as individual personal characteristics, previous experiences and social pressures to undertake behaviour change, predict the likelihood of compliance with self-protective behaviours (Rosenstock, 1974).

Provision of extra sessions and workshops on HIV/AIDS acquaint one with excellent HIV/AIDS knowledge and this accelerates professional behaviour towards HIV/AIDS patients. Several studies have proven that students who are more knowledgeable about HIV/AIDS are inclined to have positive attitude towards HIV/AIDS positive patients. (McDaniel et al., 1995; Maimaiti et al., 2010; Cohen et al., 2005; Oliveira et

al., 2002; Malele-Kolisa, 2009). Knowledge, attitude and maturity are the fundamental elements to build a human character. Human character with observation of socio-economic background of a person dictates the quality of service a person has to provide. Dentists have an ethical, moral and professional obligation to prevent themselves, co-workers, patients and society at large from any avoidable harm including exposure to HIV infection (Azodo et al., 2010b) (HPCSA, 2007).

5.4 LIMITATIONS

In general, we know that KAP studies are susceptible to several disadvantages. Knowledge, attitude and practice are indivisible. Factors that influence one's behaviour or practice such as income, education of parents, individual thoughts, physical environment and social identity were not considered in this study. The questions were pre-coded and this might have swayed the respondents towards the responses listed, thereby impacting on the true reflection of the existing knowledge, attitude and practice levels of dental students. Only few KAP studies on dental students were published in South Africa and Sub-Saharan Africa and hence local literature is minimal for the purpose of comparisons thereof. The findings of this study cannot be generalised on the population of dental students in Southern Africa. However, this can be beneficial for the evaluation and modification of the existing policy guidelines and dental programmes.

5.5 CONCLUSION

Caution is exercised in drawing conclusion of this study, due to the nature of study design (cross-sectional study) and the sample size, which is relatively small. Generalisation of the results will be advised against as the study was conducted on the participants or dentals students in one dental program, at a specific university in South Africa. Students relatively have a good understanding of HIV/AIDS (particularly the mode of transmission) but to a lesser extent disease progress and oral manifestation. Gender was statistically significant towards knowledge and females were more knowledgeable about HIV/AIDS as compared to males

(p=0.058). Students' not knowing that HIV increases other infections including oral infections and oral manifestation of HIV/AIDS in their clinical years is of a grave concern.

Students' general attitude towards HIV/AIDS patients was acceptable even though some of their behaviours towards HIV-positive/AIDS patients were not commendable. Ethnic groups and levels of study (BDS4 & BDS5) were found to be significant predictors of attitude regarding HIV-positive patients (p=0.001) (p=0.055) (p=0.001). CPR is an important procedure to save a person's life during medical emergency and almost half of the students don't recognise the importance of carrying out such a procedure on HIV/AIDS patients. Lack of consistency in following universal precautions is quite disturbing that only sometimes, half of the students thoroughly wash their hands before treating patients, disinfect light handles and flash suction pipes in between patients.

Practice was found to be a significant predictor of knowledge regarding HIV/AIDS (p=0.046). Pearson's correlation coefficient showed students with positive attitude scores had significantly more excellent practice regarding HIV/AIDS (r=0.2912) (p=0.001). Good knowledge translates into excellent infection control practices, whilst positive attitude towards HIV/AIDS patients yields excellent infection control practices. This study confirms the findings of previous studies that showed that, overall good knowledge does translate into positive attitude and good practices.

5.6 RECOMMENDATIONS

The lack of knowledge on HIV/AIDS and infection control procedures may be a reflection of appropriate HIV/AIDS teaching and clinical supervision of students in the wards. It is also important for clinical supervisors, curriculum designers and lecturing staff to improve the current dental curriculum by including HIV/AIDS module that improves awareness of clinical signs and symptoms of HIV/AIDS and the ability to allow students to refer patients for more investigations.

There should be a clinical component that will allow dental students rotate at the ARV clinics weekly, so as to become accustomed to clinical exposures of oral manifestation of HIV/AIDS. Skills development programmes should be part of the dental curriculum, whereby dental students can be trained to have proficient communication and counsel skills towards HIV/AIDS patients. The faculty policy on universal precautions and protocols, HIV+/AIDS patients management protocol and policies should be integrated as part of the dental curriculum during students' clinical years. Clinical supervisors, curriculum designers and lecturing staff should help students translate their theoretical background on HIV/AIDS into practise during clinical hours and also to reinforce universal precautions.

REFERENCES

Ahmed, S.I., Hassali, M.A. & Aziz, N.A. (2009) An Assessment of The Knowledge, Attitudes, Risk Perceptions of Pharmacy Students Regarding HIV/AIDS [online]. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2690879 [Accessed 14 June 2011].

Ajayi, Y.O. & Ajayi, E.O. (2008) Dental Students' Knowledge of Human Immunodeficiency Virus [online]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/18336987 [Accessed 15 May 2012].

Arjuna, N.B., Ellepola, Sundaram, D.B.S., Joseph, B.K. & Sharma, P.M. (2010) Knowledge and Attitudes about HIV/AIDS of Dental Students from Kuwait and Sri Lanka [online]. Available from: http://www.jdentaled.org/content/75/4/574.full [Accessed 29 May 2012].

[Author unknown] Malaysia's People, Society and Lifestyles [online]. Available from: http://www.malaysiaexplorer.net/malaysia_people.html [Accessed 30 June 2012].

[Author unknown] (2011) Population and Housing Census, Malaysia 2012 Census [online]. Available from: http://www.statistics.gov.my/portal/index.php?option=com_content&view=article&id=1215&Itemid=89&lang=en [Accessed 21 April 2011].

Azodo, C.C., Ehigiator, O., Oboro, H.O., Ehizele, A.O., Umoh, A., Ezeja, E.B., Omili, M. & Ehigiator, L. (2010a) Nigerian Dental Students' Willingness to Treat HIV-positive Patients [online]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/20388818 [Accessed 06 August 2011].

Azodo, C.C., Ehizele, A.O., Umoh, A. & Ogbebor, G. (2010b) Preventing HIV Transmission in Nigeria: Role of the Dentists [online]. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3216151 [Accessed 29 May 2012].

Azodo, C., Umoh, A., Ezeja, E. & Ukpebor, M. (2007) A Survey of HIV-related Knowledge and Attitude among Dental Nursing Students in South Western Nigeria. Available from: http://www.jdentaled.org/content/74/4/446.full [Accessed 29 May 2012].

Bezuidenhout, S. & Summers, R.S. (2009) HIV and AIDS Knowledge of Pharmacy Students at the University of Limpopo (Medunsa Campus) / Tshwane University of Technology Before and After a Teaching Intervention [online]. TD: The Journal for Transdisciplinary Research in Southern Africa, Jul, **5**(1), pp. 87-103. Available from: http://dspace.nwu.ac.za/handle/10394/3963 [Accessed 28 March 2012].

Blignaut, E. (2007) "*Oral Health Needs of HIV/AIDS Orphans in Gauteng, South Africa.*" AIDS Care, **4**(19), pp. 532-8.

Centres for Disease Control and Prevention (2003) Guidelines for Infection Control in Dental Health-Care Settings. Morbidity and Mortality Weekly Report, **52**(RR-17).

Centres for Disease Control and Prevention (2006) Definition of HIV/AIDS [online]. Available from: http://www.cdc.gov/hiv/resources/qa/definitions.htm [Accessed 28 March 2012].

Cohen, L.A., Romberg, E., Dixon, D.A. & Grace, E.G. (2005) Attitudes of Dental Hygiene Students towards Individual with AIDS [online]. Milieu in Dental School and Practice. Available on: http//: www.jdentaled.org/content/69/2/266.full [Accessed on 14 February 2011].

Darling, M., Arendorf, T. & Samaranayake, L.P. (1992) Oral Care of HIV-infected Patients: The Knowledge and Attitudes of South African Dentists. Journal of Dental Association of South Africa, Sep, **47**(9), pp. 399-402.

De Carvalho Sales-Peres, S.H., Mapengo, M.A.A., De Moura-Grec, P.G., Marsicano, J.A., De Carvalho Sales-Peres, A. & Sales-Peres, A. (2012) Oral Manifestations in HIV+ Children in Mozambique [online]. Available from: http://www.scielo.br/scielo.php?pid=S1413-81232012000100008&script=sci_arttext [Accessed 29 April 2012].

De Kock, K. & Van Wyk, C.W. (2001) Infection Control in South African Oral Hygiene Practice. South African Dental Journal, **56**(12), pp. 584-587.

Dorrington, R., Boure, D., Bradshow, D., Laubscher, R. & Timaeus, I.M. (2001) Burden of Diseases Research Unit [online]. Medical Research Council. Available from: www.mrc.ac.za/bod [Accessed 14 February 2011].

Ellepola, A.N., Sundaram, D.B., Jayathilake, S., Joseph, B.K. & Sharma, P.N. (2011) Knowledge and Attitudes about HIV/AIDS of Dental Students from Kuwait and Sri Lanka [online]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/21460279 [Accessed 01 June 2012].

Erasmus, S., Luiters, S. & Brijlal, P. (2005) Oral Hygiene and Dental Student's Knowledge, Attitude and Behaviour in Managing HIV/AIDS Patients. International Journal of Dental Hygiene, 3, pp. 213-217.

Franco-Paredes, C., Tellez, I. & del Rio, C. (2006) Rapid HIV Testing: A Review of the Literature and Implications for the Clinician [online]. Available from: www.ncbi.nlm.nih.gov/pubmed/17032576 [Accessed 24 April 2012].

Frezzini, C., Leao, J.C. & Porter, S. (2005) Current Trends of HIV Disease of the Mouth [online]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/16138890 [Accessed 20 July 2011].

Hartshorne, J.E., Carstens, I.L., Engelbrecht, J.J. & Hattingh, D. (1994) Dental and Oral Hygiene Students' Knowledge of HIV Infection and AIDS. Journal of Dental Association of South Africa, **49**(4), pp. 161-7.

Holmes, H.K. & Stephen, L.X.G. (2002) Oral Lesions of HIV Infection in Developing Countries. Journal of Oral Diseases, **8**(S2), pp. 40-43.

Jain, M., Mathur, A., Kumar, S., Dagli, R.J., Prabu, D. & Kulkarni, S. (2008) Knowledge and Attitude among Dental Students of Udaipur, India towards HIV/AIDS. Journal of Oral Health Community Dentistry, **2**(2), pp. 30-35.

Kaliyaperumal, K. & Expert, I.E.C. (2004) Guideline for Conducting Knowledge, Attitude and Practice (KAP) Study [online]. Available from: http://laico.org/v2020resource/files/guideline_kap_Jan_mar04.pdf. [Accessed 14 April 2012].

Kaste, L.M. & Bednarsh, H. (2007) The Third Decade of HIV/AIDS: A Brief Epidemiologic Update for Dentistry [online]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/18275696 [Accessed 26 April 2012].

Khosravanifard, B., Rakhshan, V., Ghasemi, M., Pakdel, A., Sheikholeslami, R., Dadolahi-Sarab, T. & Rakhshan, H. (2012) Tehran Dentist Self-reported Knowledge and Attitudes Towards HIV/AIDS and Observed Willingness to Treat Simulated HIV-positive Patients [online]. Available from: http://www.emro.who.int/fr/emhj-volume-18-2012/issue-9/article-4.html [Accessed 19 October 2012].

Launiala, A. (2009) KAP Guidelines [online]. Anthropology Matters Journal, **11**(1) Available at: www.anthropologymatters.com/index.php?journal=anth [Accessed 14 April 2012].

Maimaiti, N., Shamsuddin, K., Abdurahim, A., Tonti, N. & Mamet, R. (2010) Knowledge, Attitude and Practices Regarding HIV/AIDS among University Students in Xinjiang [online]. Available from: http://www.ccsenet.org/gihs [Accessed 24 April 2011].

Malele-Kolisa, Y. (2009) Knowledge, Attitudes and Practices of Caregivers about Oral Health Care [online]. Available from: www.wiredspace.wits.ac.za/bitstream/.../FULL%20RESEARCH%20REPORT [Accessed April 2011].

Margiotta, V., Campisi, G., Mancuso, S., Accurso, V. & Abba-dessa, V. (1999) HIV Infection: Oral Lesions, CD4+ Cell Count and Viral Load in an Italian Study Population [online]. Available from: http://www.onlinelibrary.wiley.com/doi/10.1111/j.1600-0714.1999...x/pdf [Accessed 18 June 2012].

Mathabathe, N. (2006) Oral Health Practitioners and HIV/AIDS: Knowledge, Attitudes and Practices [online]. Available from: www.wiredspace.wits.ac.za/.../Oral%20Health%20Practitioners%20HIV_AIDS [Accessed April 2011].

McDaniel, Stephen J. & Carlson, L. M. (1995) A Survey of Knowledge and Attitude about HIV/AIDS among Medical Students [online]. Available on: http://www.ncbi.nlm.nih.gov/pubmed/7673581 [Accessed 20 July 2011].

Mehtar, S., Shisana, O., Mosala, T. & Dunbar, R. (2007) Infection Control Practices in Public Dental Care Services: Findings from One South African Province [online]. Available from: www.osap.org/resource/resmgr/Docs/6dentalinfectioncontrolm.pdf [Accessed 14 February 2011].

Nasir, E.F., Astrom, A.N., David, J. & Ali, R.W. (2008) HIV & AIDS Related Knowledge, Sources of Information and Reported Need for Further Education Among Dental Students in Sudan-Across-Sectional Study [online]. Available from: http://www.biomedicalcentral.com/1471/-2458/8/286,BMCPublicHealth2008,8:286 [Accessed March 2011].

Neville, B.W., Damm, D.D., Allen, C.M. & Bouquot, J. E. (2002) Oral and Maxillofacial Pathology. 2nd edition. USA: Saunders.

Oliveira, E.R., Narendran, S. & Falcão, A. (2002) Brazilian Dental Students' Knowledge and Attitudes towards HIV Infection, AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV [online]. **14**(4), pp. 569-576 Available from: http://dx.doi.org/10.1080/09540120208629675

Palenik C.J., Burke, F.J. & Miller, C.H. (2000) Strategies for Dental Clinic Infection Control. Dental Update 2000, Jan-Feb, **27**(1), pp. 7-10, 12, 14-15.

Rosenstock, I.M. (1974) Historical Origins of The Health Belief Model. Health Education Monographs, 2, pp. 328–335.

Rwenyonyi, C.M., Kutesa, A., Muwazi, L., Okullo, I., Kasangaki, A. & Kekitinwa, A. (2011) Oral Manifestations in HIV/AIDS-infected Children [online]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/21769270 [Accessed 29 April 2012].

Ryalat, S.T., Sawair, F.A., Shayyab, M.H. & Amin, W.M. (2011) The Knowledge and Attitude about HIV/AIDS among Jordanian Dental Students (Clinical Versus Pre-Clinical Students) at The University of Jordan [online]. Available from: www.biomedical.com/1756-0500/4/19/ [Accessed March 2011].

Sadeghi, M. & Hakimi, H. (2009) Iranian Dental Students' Knowledge of and Attitudes towards HIV/AIDS Patients [online]. Milieu in Dental School and Practice. Available from: http://www.ncbi.nlm.nih.gov/pubmed/19491351 [Accessed March 2011].

Schopper, D., Doussantousse, S. & Orav, J. (1993) Sexual Behaviours Relevant to HIV Transmission in a Rural African Population: How Much Can a KAP Survey Tell Us? [online]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/8356488 [Accessed 14 April 2012].

Seacat, J.D., Litt, M.D. & Daniels, A.S. (2009) Dental Students Treating Patients Living with HIV/AIDS: The Influence of Attitudes and HIV Knowledge [online]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/19339430 [Accessed 20 April 2012].

Seacat, J.P. & Inglehart, M.R. (2003) Education about Treating Patients with HIV Infections/AIDS: The Student Perspective [online]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/12856963 [Accessed 18 June 2012]

Shaikh, H., Shankar, S. & Vinay, S. (2011) Knowledge and Attitudes of Undergraduate Dental Students in the Oxford Dental College Hospital and Research Centre, Bangalore toward Patients with HIV/AIDS [online]. Available from: http://jiads.net/Archives/new-issues/1.pdf [Accessed 02 May 2012].

Shangase, L., Feller, L. & Blignaut, E. (2004) Necrotizing Ulcerative Gingivitis/Periodontitis as Indicators of HIV Infection. South African Dental Journal 2004, 59, pp. 105-108.

Stegman, J.K. (eds.) (2006) Stedman's Medical Dictionary. 28th edition. United States of America (USA): Lippincott Williams and Wilkins.

The Health Care Professions Council of South Africa (2007) Guidelines for Good Practice in The Health Care Professions: Confidentiality: Protecting & Providing Information, 2nd edition, Booklet 11 [online]. Pretoria. Available from: www.hpcsa.co.za [Accessed 29 April 2012].

The Health Care Professions Council of South Africa (2007) Guidelines for Good Practice in The Health Care Professions: Ethical Guidelines for Good Practice with Regards to HIV, Booklet 12 [online]. Pretoria. Available from: www.hpcsa.co.za [Accessed 10 February 2011].

The Health Care Professions Council of South Africa (2008) Guidelines for Good Practice in The Health Care Professions: Ethical Guidelines for Good Practice with Regards to HIV, Booklet 11 [online]. Pretoria. Available from: www.hpcsa.co.za [Accessed 14 February 2011].

UNAIDS (2008) Country Progress Indicators. Report on the Global AIDS Epidemic [online]. Available from: http://data.unaids.org/pub/GlobalReport/2008/jc1510_2008_global_report_pp235_324_en.pdf [Accessed 22 April 2011].

UNAIDS (2008) HIV and AIDS Estimates and Data 2007 and 2001. Report on the Global AIDS Epidemic. [online]. Available from: http://data.unaids.org/pub/GlobalReport/2008/jc1510_2008_global_report_pp211_234_en.pdf [Accessed 21 April 2011].

UNAIDS (2010) Country Progress Indicators. Report on the Global AIDS Epidemic: Sub-Saharan Africa [online]. Available from: http://www.unaids.org/documents/20101123_FS_SSA_em_en.pdf [Accessed 22 April 2011].

Waite & Hawker (eds.) (2009) Oxford Paperback Dictionary and Thesaurus. 3rd edition. New York: Oxford University Press.

WHO (2004) [online]. Available from: http://www.globalhealth.org >key issues>HIV/AIDS.

WHO (2005) [online]. Available from: http://www.globalhealth.org >key issues>HIV/AIDS.

Yengopal, V. Naidoo, S. & Chikte, U.M. (2001) Infection Control among Dentists in Private Practice in Durban. South African Dental Journal 2001, 56, pp. 580-584.

APPENDIX 1: SELF-ADMINISTERED QUESTIONNAIRE

Knowledge, Attitude and Practice Regarding HIV/AIDS among dental students at Medunsa Oral Health Centre

The aim and objectives of the study have been sufficiently explained to me. I have not been pressurised to participate in any way. I understand that participation in this study is completely voluntary and that I may with draw from it at any time and without any adverse consequences.

I know that this study has been approved by the Research, Ethics and Publications Committee of the University of Limpopo, Medunsa Campus, and permission to carry out the study has been given by the Oral and Dental Hospital. I am fully aware that the results of this study will be used for scientific purposes and may be published. I agree to this, provided my privacy is guaranteed.

Please mark the appropriate answers with an X

Reference Number:_____

Socio-demographics

Age					
Gender	Male	Female			
Ethnic Group	Black	White	Coloured	Indian	Other
Level of Study	BDS 3	BDS 4	BDS 5		
Area of residence	Rural	Semi-Urban	Urban		
Have you had any Previous training in HIV/AIDS?				Yes	No
Previous tertiary Qualification	Diploma	Degree	Honours	Masters	N/A

Knowledge about HIV/AIDS and Mode of Transmission

1. Persistent generalised lymphadenopathy is associated with stage 2 of HIV infection.

NS-Not Sure	A-Agree	D-Disagree

2. HIV increases other infections including oral infections as well.

NS-Not Sure	A-Agree	D-Disagree

3. Dental clinician can contract HIV from an eye splash incidents during dental treatment.

NS-Not Sure	A-Agree	D-Disagree

4. Dental clinician should take Post exposures prophylaxis within 72hours during an eye splash incidents to prevent HIV.

NS-Not Sure	A-Agree	D-Disagree

5. Oral Kaposi Sarcoma is virtually exclusive to HIV infection.

NS-Not Sure	A-Agree	D-Disagree

6. Antiretroviral drugs can cure HIV infection.

NS-Not Sure	A-Agree	D-Disagree

7. Oral Candidiasis is virtually exclusive to HIV infection.

NS-Not Sure	A-Agree	D-Disagree

8. Cough/sneeze droplets can transmit HIV.

NS-Not Sure	A-Agree	D-Disagree

9. Kissing with exchange of saliva with HIV positive and AIDS people can transmit HIV.

NS-Not Sure	A-Agree	D-Disagree

10. Xerostomia is virtually exclusive to HIV infection.

NS-Not Sure	A-Agree	D-Disagree

Attitude

1. I will get HIV from treating an HIV+/ AIDS patient.

NS-Not Sure	A-Agree	D-Disagree

2. Handling HIV+/ AIDS patients is too time-consuming.

NS-Not Sure	A-Agree	D-Disagree

3. I can volunteer to provide my services for AIDS speciality centre.

NS-Not Sure	A-Agree	D-Disagree

4. I will double my gloves if I am treating an HIV+/ AIDS patient.

NS-Not Sure	A-Agree	D-Disagree

5. Managing HIV+/ AIDS patients is a waste of government's resources.

NS-Not Sure	A-Agree	D-Disagree

6. HIV+/AIDS patients should not be allowed to conceive.

NS-Not Sure	A-Agree	D-Disagree

7. I am not obligated to treat HIV+/AIDS patients.

NS-Not Sure	A-Agree	D-Disagree

8. I will perform an emergency resuscitation (CPR) if an HIV+ / AIDS patients need it.

NS-Not Sure	A-Agree	D-Disagree

9. I am morally responsible to treat HIV+/AIDS patients.

NS-Not Sure	A-Agree	D-Disagree

10. HIV+/AIDS patients should be isolated from the entire community.

NS-Not Sure	A-Agree	D-Disagree

Infection Control Practices

How often do you follow the under mentioned routines?

	(N) Never	(A) always	(S) sometimes	(NS) Not Sure
1. Personal protective clothing *before treating patients.*				
2. Disinfect working surfaces before treating patients.				
3. Sterilisation of hand pieces after use.				
4. Thorough washing of hands before treating patients.				
5. Change gloves in between patients.				
6. Wash hands after treating patients.				
7. Disinfect light handles before treating patients.				
8. Immediate disposing of used injecting needles after treating patients.				
9. Flash suction pipes in between patients.				
10. Autoclave dental instruments after treating patients.				

APPENDIX 2: LETTER TO REQUEST FOR AUTHORIZATION TO CONDUCT THE STUDY

P. O. Box 528
Polokwane
0700
01 March 2012

Head of School of Dentistry
University of Limpopo: Medunsa Campus
The CEO of Medunsa Oral Health Centre
Box D 11
Medunsa
0204

Dear Sir/Madam

REQUEST FOR PERMISSION
TO CONDUCT RESEARCH AT MEDUNSA ORAL HEALTH CENTRE

I am a student doing Masters in Public Health at the University of Limpopo, Medunsa campus and requesting for your permission to conduct research study amongst the third, four and fifth year dental students who are already seeing patients.

The study topic is Knowledge, Attitude and Practice Regarding HIV/AIDS among Dental Students at Medunsa Oral Health Centre. The purpose of the study is to assess the level of knowledge, attitudes and infection control practices of third, fourth and fifth year dental students regarding HIV-positive patients at the Medunsa Oral Health Centre (MOHC).

Kindly find the attached documents: Research proposal and MREC approval Certificate. Should you require any clarification regarding the above, you can contact me on: Tel/Cell: (012) 319 2931 / 082 407 9192 E-mail: Leslie.Galane@up.ac.za.

I would be grateful if my request will be accepted.

Thank you for assistance.

Yours Sincerely,

(Signed)

_____

Dr. Leslie Galane

APPENDIX 3: E-MAIL EXCHANGE WITH PROFESSOR GUGUSHE

From: Leslie Galane [mailto:Leslie.Galane@up.ac.za]
Sent: 01 March 2012 04:41 PM
To: Gugushe, Tshepo
Subject: REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY AT MEDUNSA ORAL HEALTH CENTRE

Dear Professor Gugushe

I am a student doing a Masters degree in Public Health at the University of Limpopo, Medunsa campus and requesting for your permission to conduct research study amongst the third, four and fifth year dental students who are already seeing patients in MOHC.

The study topic is Knowledge, Attitude and Practice Regarding HIV/AIDS among Dental Students at Medunsa Oral Health Centre. The purpose of the study is to assess the level of knowledge, attitudes and infection control practices of third, fourth and fifth year dental students regarding HIV-positive patients at the Medunsa Oral Health Centre (MOHC).

Kindly find the attached documents: Research proposal and MREC approval certificate .Should you require any clarification regarding the above, you can contact me on: Tel/Cell: (012) 319 2931 / 082 407 9192 E-mail: Leslie.Galane@up.ac.za.

I would be grateful if my request will be accepted.

Yours Sincerely,

Dr. Leslie Galane

Respond from: >>> "Gugushe, Tshepo" <Tshepo.Gugushe@ul.ac.za> 3/9/2012 8:38 AM >>>

Dear Dr Galane

Your e-mail dated 1/3/2012 has reference. Permission is granted to undertake your study as indicated. I will however forward your protocol to the School's REC for noting.

Kind Regards,

Prof T Gugushe
Director: School of Oral Health Sciences
CEO: Medunsa Oral Health Centre
Tel: 012 521 4800
Fax: 012 521 4102
Fax to e-mail: 086 655 3528
Cell: 082 903 0659
E-mail: tshepo.gugushe@ul.ac.za

APPENDIX 4: ETHICAL CLEARANCE CERTIFICATE

UNIVERSITY OF LIMPOPO
Medunsa Campus

MEDUNSA RESEARCH & ETHICS COMMITTEE

CLEARANCE CERTIFICATE

MEETING: 01/2012

PROJECT NUMBER: MREC/H/14/2012: PG

PROJECT :

Title: Knowledge, attitude and practices regarding HIV/AIDS among dental students at Medunsa Oral Heath Centre

Researcher: Dr M Galane
Supervisor: Dr SL Mndzebele
Department: Public Health
School: Health Care Sciences
Degree: MPH

DECISION OF THE COMMITTEE:

MREC approved the project.

DATE: 15 February 2012

RESEARCH & PARTNERSHIP 2012 -02- 15 MEDUNSA CAMPUS

PROF GA OGUNBANJO
CHAIRPERSON MREC

Federal Wide Assurance (FWA) Number: **FWA00009419**
Institutional Review Board (IRB) Number: **IRB00005122**

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.

Finding Solutions for Africa

PROUDLY SOUTH AFRICAN