

**Oral HIV knowledge and practices of  
primary health care nurses in the  
uMgungundlovu Health District,  
KwaZulu-Natal**

by

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## **KEYWORDS**

HIV/AIDS

Oral manifestations

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Primary Health Care

Nurses

KwaZulu-Natal

Indicator

Markers

Stigma

Voluntary Counselling and Testing



## ABSTRACT

**Aim** The aim of the study was to determine the oral health knowledge, management and referral patterns of patients with oral manifestations of HIV by Primary Health Care Nurses.

**Background** Nurses working in Primary Health Care (PHC) facilities, and nursing educators, play a pivotal role in the early identification, referral and diagnosis of patients who present for treatment of health problems. They are in an ideal position to identify HIV-infected persons through a simple visual assessment of the mouth, in order to diagnose oral lesions that may be prognostic of HIV, and to then refer these persons for voluntary counselling and testing (VCT). Timely referral will lead to early medical intervention, with lower treatment costs and improved patient quality of life.

**Methods** The study design comprised of a pre- and post-education test, training and provision of educational material, together with a quantitative and qualitative self-administered questionnaire. The questionnaire gathered information on nurses demographics, experience, knowledge, training and treatment practices.

The study design was a cross-sectional survey which was conducted during the period July to October 2010. The study population consisted of 121 nurses based at Primary Health Care and nursing education facilities within the uMgungundlovu Health District in KwaZulu-Natal. The chi-squared test was utilised to determine the statistical significance of the pre-education and post-education test results and Pearson's Correlation Coefficient was used to determine the significance of correlations between variables. A *p-value* of  $<0.05$  was regarded as being statistically significant.

**Results** A large number of the respondents did not receive substantial oral health education during both their pre-qualification and post-qualification education stages. Nurses had an inadequate knowledge of oral health assessment and of oral conditions, especially with regard to the common prognostic oral manifestations of HIV. The post-test results were statistically significant ( $p < .0001$ ), indicating that the provision of education and training to the nurses had a significant impact on nurses knowledge of oral conditions. More than two-thirds of the nurses (67,8%) reported that they do not examine the mouth as part of routine overall assessment of the patient, and only 13% referred patients for VCT.

**Conclusions** There is a need to include oral health assessment and oral health promotion into both undergraduate and post-graduate nursing curricula. Further research is needed to identify the specific oral health training needs of all categories of nurses in order to overcome the barriers that prevent nurses from assessing the mouth. Oral health assessment and oral health promotion should become a key part of the curricula of nurses training. The use of oral health promotion workers at a primary health care level should also be considered.

**Keywords:** oral manifestations, HIV/AIDS, Primary Health Care Nurses

# DECLARATION

I, the undersigned, hereby declare that the work contained in this dissertation is my original work and that it has not been previously in its entirety or in part submitted at any university for a degree.



  
T. A. Muslim

T A Muslim

01 September 2011

Date

## DEDICATION



I dedicate this work to my creator and lord, Allah ﷻ (SWT),

the most beneficial, the most merciful.



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*“And as we let our own light shine,  
we unconsciously give other people  
permission to do the same,”*

Nelson Mandela, Father of our nation.

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My Creator and Lord, Allah (SWT) in whose hands my destiny lies.

## LIST OF ABBREVIATIONS

- AIDS** - Acquired Immuno-deficiency Syndrome
- ART** - Anti-Retroviral Treatment
- ASGI-SA** - Accelerated Shared Growth Initiative for South Africa
- CDC** - Centre for Disease Control
- CIDC** - Client-Initiated HIV Testing and Counselling
- DHS** - District Health System
- DOH** - Department of Health
- EN** - Enrolled Nurse
- GDP** - Gross Domestic Product
- HIV** - Human Immuno-deficiency Virus
- JIPSA** - Joint Initiative on Priority Skills Acquisition
- KPA's** - Key Priority Area's
- KZN** - KwaZulu-Natal



- OH** - Oral Hygiene
- OHL** - Oral Hairy Leukoplakia
- PHC** - Primary Health Care
- PITC** - Provider-Initiated HIV Testing and Counselling
- PLWHA** - People Living With HIV and AIDS
- PMTCT** - Prevention of Mother to Child Transmission
- PN** - Professional Nurse
- RN** - Registered Nurse
- SANAC** - South African National AIDS Council
- SANC** - South African Nursing Council
- STI's** - Sexually Transmitted Infections
- STD's** - Sexually Transmitted Diseases
- VCT** - Voluntary Counselling and Testing
- WHO** - World Health Organisation



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# **CHAPTER 1: Introduction**

## **Background**

In the 1990's South Africa was one of the few countries in the world where the wholesale transformation of the health system began with a clear political commitment to, inter-alia, ensure equity in resource allocation, restructure the health system according to a district health system (DHS) and deliver health care according to the principles of the PHC approach (Department of Health, 2007). Primary health care has been at the heart of the plan to transform the health services in South Africa. An integrated package of essential primary health care services available to the entire population was developed to provide the solid foundations of a single, unified health system, and to be the driving force in promoting equity in health care (Department of Health, 2008). The Department of Health further suggested that a comprehensive range of services were to be provided, including the identification of possible cases, testing with pre-and post-counselling, the treatment of associated infections, referral of appropriate cases, education about the disease to promote better quality of life and promotion of universal precautions. The implementation of the District Health System resulted in patients being shunted away from seeking medical treatment (for minor ailments and non-life threatening conditions) at hospitals (where they were seen to by a medical doctor as outpatients) to local Primary Health Care Clinics where they were seen to by Primary Health Care (PHC) nurses and only referred to a medical doctor/hospital if the PHC nurse referred them accordingly.

Currently large numbers of patients are examined and assessed, diagnosed and treated by PHC nurses who either assume complete control of the treatment of the patient or refer the patient to medical practitioners and/or other health care workers. As the PHC nurse is often the patients first point of contact with the medical system PHC nurses can play a vital role in the early diagnosis of HIV pre-indicative oral lesions and in the early treatment and management of the oral manifestations of HIV/AIDS. South Africa has an estimated HIV prevalence rate of 15,4%, and in the uMgungundlovu District of KwaZulu-Natal the HIV

prevalence rate in patients aged 15-24 years attending ante-natal clinic is 38.7% (Aidsmap, 2008). It is estimated that the number of people living with HIV in South Africa at the end of 2010 was between 5,4 million and 6,6 million (UNAIDS, 2010), and that deaths due to AIDS was between 270 000 to 420 000, leaving behind a total of between 1 100 000 and 1 800 000 orphans.

## **Problem Statement**

The early identification of HIV in either the HIV+ well patient or HIV+ unwell patient can lead to early intervention and treatment, thus resulting in a higher quality of life for the patient and lower treatment costs for the state. Coupled with the early treatment of the HIV+ patient is the need for the provision of oral health promotion and education information.

Some of the limitations to the provision of oral health information include the lack of dental health facilities and oral health personnel. However Moon et al., (1998) argued that all healthcare workers should be able to screen for oral abnormalities. A key resource that could be utilized in the early identification of HIV and the early treatment of the oral manifestations is the Primary Health Care nurse (Nasir, 2001). With increasing numbers of patients only being treated by a PHC nurse it is imperative that the skills and role of the PHC nurse be harnessed in the fight against HIV/AIDS. These nurses are in an ideal position to identify potentially HIV+ patients and to refer them for voluntary counselling and testing (VCT). A recent study reported that 74,4% of HIV-infected patients presented with one or more oral mucosal lesions, of which only 30,4% were symptomatic (Nasir, 2001). A further 6% of the patients who first complained of oral symptoms were subsequently found to be diagnosed as HIV+ (Arendorf et al., 1998). This has serious implications for the health of the patient, since if left untreated these oral manifestations can affect the quality of the patients life, and could lead to an earlier-than-necessary need for initiation of costly ART therapy.

## Implications

A study done by Nasir in Lesotho in 2001 showed that only 25,2% of the nurses were able to recognize that oral hairy leukoplakia (OHL) and 22.1% did not recognize necrotizing ulcerative gingivitis (NUG) as being oral manifestations of HIV. The purpose of the present study is to determine the oral health knowledge, practices and management patterns of the oral manifestations of HIV of Primary Health Care Nurses in the uMgungundlovu District, so as to allow for early diagnosis and cost-effective treatment interventions to improve the oral health quality of life for patients living with HIV. It is also intended to ascertain the need for oral health promotion, education and oral pathology identification to be included into the nursing curriculum. Nasir (2001) has previously recommended further research in the evaluation of the oral health knowledge of nurses and for the inclusion of this training into their curricula.



## **CHAPTER 2: Literature Review**

### **Preamble**

This review of recent literature aims to provide an overview of nursing practitioner knowledge and practices regarding the oral manifestations of HIV/AIDS. It reports on AIDS in Africa, the history of AIDS in Africa, policy and political responses to HIV/AIDS, health systems, the role of the nurse, nursing education, oral health and general health, the oral manifestations of HIV/AIDS, VCT and stigma.

A comprehensive computer-assisted search of scientific literature was conducted using Medline and Pubmed and other journal search engines, in addition to a book search. A total of 279 papers and abstracts were identified, using the MeSH words inter-alia:- “oral manifestations of HIV and AIDS, HIV pre-indicative oral lesions, primary health, primary health care nurses, oral health assessment practices.” Of the 279 papers and abstracts sourced 176 were utilised in this study. The search was supplemented by a review of the references cited in the retrieved articles. Notwithstanding these extensive searches, very little literature was found as to the role of the nurse and other primary healthcare workers with regard to examination of their oral cavity, nor their knowledge of pre-indicative oral manifestations of HIV.

### **Introduction**

*“The HIV epidemic carries within it forces of destruction and of healing. Which prevails will be the measure of ourselves and our societies.”* (Jackson, 2002).

Almost three decades after the first cases were reported, AIDS has developed into one of the most devastating challenges the world has ever faced. Despite some progress in treatment,

there is little hope for a cure or vaccine in the near future. As of 2009, 32,8 million people worldwide are estimated to be living with HIV. More than half of them (52%) are women and 2,5 million are children under 15 years of age. Sub-Saharan Africa remains the most adversely affected region. It is home to 68 per cent (22,5 million) of those living with HIV, and to nine out of ten children who have lost one or both parents to AIDS. In Sub-Saharan Africa, AIDS is the leading cause of death, although this is now starting to change (UNAIDS, 2010). It is estimated that 72% of the global total of HIV/AIDS related deaths occurred in Sub-Saharan Africa in 2009 (UNAIDS, 2010). However five countries in sub-Saharan Africa, including Botswana, South Africa and Zimbabwe, have reported significant declines in HIV-prevalance (UNAIDS, 2010).

Worldwide, by far the most common means of HIV transmission continues to be unprotected sex with an infected partner. In countries with low or concentrated epidemics (i.e. where HIV prevalence is less than one per cent in the general population), transmission is often linked to unsafe sexual intercourse in the context of sex work or between men, whereas in generalised epidemics, (i.e. settings where HIV prevalence in the general adult population is above one per cent), sexual networking, with low and inconsistent condom use, is sufficient to sustain the epidemic (although sub-populations at high risk may continue to contribute disproportionately to the spread of HIV). Sharing contaminated syringes and needles for injecting drug use is also a major mode of transmission in many countries. Other transmission routes include: mother-to-child transmission during pregnancy, at birth or through breast milk; and, more and more rarely, the transfusion of infected blood and blood products.

HIV/AIDS is not the only crisis facing the world but it merits serious attention (Nkhoeli, 2005). It is a pandemic that is challenging and changing human history and continues to alter and challenge all the rules by which society lives. Despite the HI Virus having such a major and devastating effect on society in general, and on the youth in particular, a vaccination or cure remains in the distant future. Recent advances include the discovery of a microbicide gel in KwaZulu-Natal and the positive results shown in tests done on a possible vaccine in Thailand (Abdool-Karrim et al., 2009). The HIV prevention microbicide gel shows great potential to arrest, if not stop, the rampant progress of this epidemic.

While the impact of the HIV/AIDS epidemic is extensive worldwide, the impact of the epidemic has been most devastating in Sub-Saharan Africa, with South Africa having one of the most extensive AIDS epidemics in the world, with millions infected with HIV and HIV has since become a major cause of death in South Africa and a national public health priority. Sub-Saharan Africa continues to have the majority of new infections, with an estimated 1.8 million new infections in 2009 (UNAIDS, 2010). HIV at one stage was spreading dramatically in Asia, and the Americas, with predictions that Asia will become the HIV/AIDS epicentre of the world (Nkhoeli, 2005). However the latest evidence, based on the 2010 UNAIDS Report on the Global AIDS Epidemic, suggests that HIV infection rates in Asia have now been stable for the last five years. Despite several interventions in place to address the epidemic, national and international new infection rates continue to remain high or to have stabilised. In 2009 an estimated 2,6 million people became newly infected with the HI virus, which is 21% fewer than the estimated 3,2 million infections that occurred in 1999, which was the peak of the epidemic (UNAIDS, 2010). In seven countries the HIV infection rate increased by more than 25% between 2001 and 2009 (UNAIDS, 2010). However the 2010 UNAIDS Report on the Global AIDS Epidemic also reports a statistically significant decline of 25% or more in HIV prevalence in seven other countries during the period 2001 to 2009. HIV/AIDS has changed the lives of millions of individuals, causing their deaths, ruining their health and leaving their children orphaned. HIV/AIDS has reduced life expectancy, burdened financial resources and productivity, destroyed the social fabric of society and crippled healthcare delivery in many countries. The severity of the disease is such that the United Nations World Health Organisation has earmarked 01 December annually as World AIDS Day.

The future of HIV/AIDS is unpredictable, as the virus mutates and becomes more easily transmitted. Science is advancing rapidly with new treatments becoming available and technological prevention methods (microbicides and vaccines) being developed (Whiteside, 2008). The virus itself is unusual, and with the most common mode of transmission being sexual intercourse, followed by mother-to-child transmission, the virus remains difficult to combat and remains stigmatizing at an individual and national level (Whiteside, 2008).

There are different sub-epidemics around the world, with Southern Africa having the epidemic being transmitted primarily through heterosexual intercourse, and more women than men infected (Whiteside, 2008). There are differences in the sizes and trajectories of African epidemics with Southern Africa having the most epidemic. In West Africa HIV seems not to have spread, with reported prevalence rates of below 1% throughout the 1980's and 1990's, and being at 0,9% in 2005 (Whiteside, 2008). The 2010 UNAIDS Report on the Global AIDS Epidemic reports an estimated adult HIV prevalence rate of 2% or under in 12 West African countries in 2009. East Africa has a prevalence that is declining, and remained below 4,7% in 2008, and in North Africa and the Middle East there is little evidence of HIV infection (Whiteside, 2008). Of the 33 countries that had a fall of more than 25% in the HIV incidence rate between 2001 and 2009 twenty-two are in sub-Saharan Africa (UNAIDS, 2010). Whereas in other populations HIV affects clearly defined groups, the situation in South Africa is different, and affects every facet of society (Whiteside, 2008). The unique political, economic and migration patterns of South Africans (and foreign migrants in South Africa) allow for the rapid spread of HIV/AIDS. However, as HIV testing expands and lifestyle changes occur, the new HIV infection rate will decline, if not stabilise.

“When Aids emerged from the shadows more than two decades ago, few people could predict how the epidemic would evolve, and fewer still could describe with any certainty the best ways of combating it. We know from experience that AIDS can devastate whole regions, knock decades off national development, widen the gulf between rich and poor nations and push already- stigmatised groups closer to the margins of society” (UNAIDS, 2008).

## **History of HIV/AIDS**

AIDS emerged in the 1980's as the “most terrifying epidemic” of modern times, and has been likened to the “black death” of the Middle Ages where millions died. Over 25 years ago clinicians in the USA identified the first cases of a syndrome that was to become known as AIDS (Whiteside, 2008). AIDS is caused by the human immunodeficiency virus, which is thought to have crossed from primates into humans. Many diseases spread from animals to humans and are called zoonoses, and include severe acute respiratory syndrome (SARS) and avian bird influenza (bird flu). The HIV crossover may have occurred as early as in the 1930's, and the first cases of the current epidemic occurred in the 1970's (Whiteside, 2008).

Doctors reported unusual cases of extremely rare diseases (e.g. *Pneumocystis carinii* and Kaposi's sarcoma), which had manifested in exceptionally serious form in young heterosexual males, and thus AIDS was publically reported in the June 5<sup>th</sup>, 1981 edition of the *Morbidity and Mortality Weekly Report* in Atlanta, USA (Whiteside, 2008). By 1982 cases were being seen among other groups (haemophiliacs, blood transfusion recipients, intravenous drug users), as well as among the partners and infants of those infected (Whiteside, 2008). Thus in 1982 the Centre for Disease Control (CDC) in Atlanta, USA produced the first working definition for AIDS, based on clinical signs.

An intense hunt for the cause of the syndrome began, and in 1983 the *Institut Pasteur* (France) identified the virus. In April 1984 the National Cancer Institute (USA) isolated the virus, which was named the human immunodeficiency virus by the International Committee on Taxonomy of Viruses (Whiteside, 2008). While AIDS was initially met with a degree of hysteria as it was viewed as a "gay men's" disease, early responses were aimed at improving blood safety, condom provision and encouraging safe drug injection practices, but these were not sufficient and the need for behaviour modification became paramount (Whiteside, 2008). At the 1996 International Aids Conference in Vancouver, Canada, it was announced that after almost 15 years, an effective antiretroviral therapy was available (Whiteside, 2008), although to date an effective vaccine and cure remains unavailable. HIV/AIDS was only recognised as a public health care problem in 1986 (Jackson, 2002), and this late recognition allowed for the rapid spread of the virus, even before the epidemic was apparent.

Retroviruses (including HIV) belong to the lentiviruses, and are slow to cause disease. HIV is related to simian (monkey) immunodeficiency viruses (SIV's) and the HI virus probably mutated from viruses found in monkeys and apes (Jackson, 2002). Exactly where, when and how the SI virus crossed over into humans is not certain, but of the several SI viruses that have been identified the SI virus found in chimpanzees (SIV cpz) is most similar to HIV-1 (Jackson, 2002), and the simian virus found in sooty mangabeys (SIV mm) is most similar to HIV-2. It is speculated that HIV may have crossed over into human beings about 60-70 years ago, and that it would take many generations for human populations to evolve sufficient immunity to survive infection (Jackson, 2002). Early AIDS deaths occurred mainly in Africa and strengthens the argument that HIV originated from monkeys (Jackson, 2002), although there is no conclusive evidence of this.

## AIDS in Africa

*AIDS today in Africa is claiming more lives than the sum total of all wars, famines and floods and the ravages of deadly diseases such as malaria...We must act now for the sake of the world.*” – Nelson Mandela, in a closing address at the 14<sup>th</sup> International AIDS Conference in Barcelona.

It has been estimated that in 2009 South Africa had 5,6 million people infected with the HIV virus and the largest population of people living with HIV in the world (UNAIDS, 2010). Swaziland continues to have the highest HIV prevalence rate in the world, with a rate of 25,9% in 2009, the highest in the world (UNAIDS, 2010).

There is a long interval between HIV seroconversion and symptomatic disease, and based on this HIV mortality peaked in 2004, when 2,2 million deaths occurred worldwide (UNAIDS, 2009). In its 2010 AIDS epidemic update the United Nations estimated that there were 1,8 million HIV/AIDS deaths and that worldwide 33,3 million people were living with HIV/AIDS, which was 20% higher than the 2000 estimate. This prevalence was therefore approximately three times higher in 1990, and in 2008 an estimated 2,7 million new infections occurred worldwide, which was approximately 30% lower than the epidemics peak 12 years ago (UNAIDS, 2009). This figure for new HIV infections for 2009 fell to 2,6 million (UNAIDS, 2010).

Between the years 2007 and 2008 national household surveys were conducted in nine Sub-Saharan countries, and the data collected reveals that the epidemic has stabilized in these regions (UNAIDS, 2009). Sub-Saharan Africa, with 71% of new infections in 2008, remains the most heavily affected region (UNAIDS, 2009). In 2001 in Sub-Saharan Africa there were 19,7 million adults and children living with HIV, 2,2 million new infections, an adult prevalence rate of 5,2% and 1,4 million deaths. In comparison, for 2009, the figures were 22,5 million living with HIV/AIDS (an increase of 2,8 million over 8 years), 1,3 million new infections (a decrease of 0,9 million), a 0,9% drop in the adult prevalence (from 5,9% to 5,0%) with deaths due to AIDS decreasing by 100 000 from 1,4 million in 2001 to 1,3 million

in 2009. In its 2010 UNAIDS Report on the Global AIDS Epidemic it is reported that for the year 2009 Southern Africa continues to remain the most severely affected region with an estimated 11,3 million people living with HIV, which is 31% more than the 8,6 million people living with HIV in the region a decade earlier.

With the unprecedented increase in access to ART treatment during the last decade the world (access to ARV drugs in low-and middle-income countries rose tenfold (UNAIDS 2009), and South Africa, which has the largest ARV therapy programme in the world, experienced substantial public health benefits associated with improved treatment. The treatment of HIV is directed towards the specific inhibition of HIV replication and the prevention and management of opportunistic infections, thus contributing to a decrease in HIV deaths. ART has greatly improved the prognosis of persons living with HIV (Leão et al., 2009). The UNAIDS epidemic update report of 2006 reports that six-month mortality among HIV patients at an HIV treatment center in the Western Cape, South Africa, fell by about half (from 12,7% in 2001/2002 to 6,6% in 2005), as more patients were exposed to ARV's. Similar results were reported in Botswana and Brazil. Leão et al., (2009) reports that since the advent of ART various clinical and epidemiological studies have attributed a considerable decline in the mortality and morbidity of HIV-positive patients to a reduction in the HIV viral load and the associated recovery in the immune function of previously ill persons. A 30% reduction in the prevalence of some oral lesions in HIV-positive persons was also reported by Leão et al., (2009), whilst other oral conditions reflected no or increased prevalence rates (e.g. HIV salivary gland disease, Kaposi's sarcoma), following the introduction of ART. Thus in the era of ART HIV and AIDS can be managed clinically and could now be regarded as being a chronic.

HIV and AIDS is one of the key challenges to South Africa. UNAIDS Report on the Global AIDS Epidemic – 2010 reports that for 2009 South Africa had 5,6 million people living with HIV, with a stabilizing off of this rate evident. However the report also indicates that South Africa is one of the few countries in the world where child and infant mortality has risen since the 1990's and that AIDS is the largest cause of maternal mortality in South Africa, accounting for 35% of deaths in children aged five years and younger. It is estimated that as

at the end of 2009 there are 602 AIDS related death every day in South Africa and that the following statistics are also applicable:-

- 390 000 new infections
- 5.6 million South Africans living with HIV
- 220 000 total AIDS deaths
- 649 939 adults and 27 000 children needing ART
- 971 556 adults and 82 000 children on ART

Source: *UNAIDS Report on the Global AIDS Epidemic – 2010*.

Thus it can be clearly seen that HIV is having a disastrous impact on the population of South Africa. Not only does the epidemic lead to increased demand for medical services but there is also an increased demand for oral health care services to treat the general and oral manifestations of HIV/AIDS. Oral health is strongly associated with physical health and there are significant increases in the oral health needs of HIV-infected persons, especially in children, and in relation to periodontal diseases in the case of adults ((Leão et al., 2009). This increased demand is further compounded by the increase in demand for oral health services that resulted from the States policy of free primary health care which was introduced in 1994. (including primary oral health care) services. Bhayat and Cleaton-Jones (2003) reported on a study in Soweto, South Africa of a statistically significant 46% increase in attendance in the year after the introduction of free primary dental health services for all age groups in 1996. They also reported a sixfold increase in casual attendees over booked patients, and increased dental operator workloads.

The epidemiological situation in South Africa is “still characterized by very large numbers of people living with HIV and a disproportionate effect on particular sectors of society (young women, the poor) and those living in undeveloped areas of the country” (HIV and AIDS and STI Strategic Plan for South Africa 2007-2011).

The HIV and AIDS and STI Strategic Plan for South Africa 2007-2011 argued that while the *“immediate determinant of the spread of HIV relates to behaviours such as unprotected sexual intercourse, multiple partners etc., the fundamental drivers of this epidemic in South Africa are the more deep rooted institutional problems of poverty, unemployment, low status of women in society.”*

The HIV and AIDS and STI Strategic Plan for South Africa 2007-2011, has identified a number of key priority Areas (KPA's). These KPA's are:

- KPA 1 - Prevention (reduce vulnerability to HIV infection, reduce the impact of AIDS, reduce sexual transmission of HIV, reduce mother-to-child transmission, reduce risk of HIV transmission through blood and blood products)
- KPA 2 - Treatment, Care and Support (increase and promote VCT, enable People Living With HIV and AIDS (PLWHA) to live a healthy and productive life, address the special needs of women and children migrates the impact of HIV and AIDS)
- KPA 3 - Research, Monitoring and Surveillance
- KPA 4 - Human and Legal Rights (ensure adherence to legal rights and policies, mobilize society and build leadership to protect and promote human rights, identify and remove legal, policy and cultural barriers to effective HIV prevention, treatment and support).

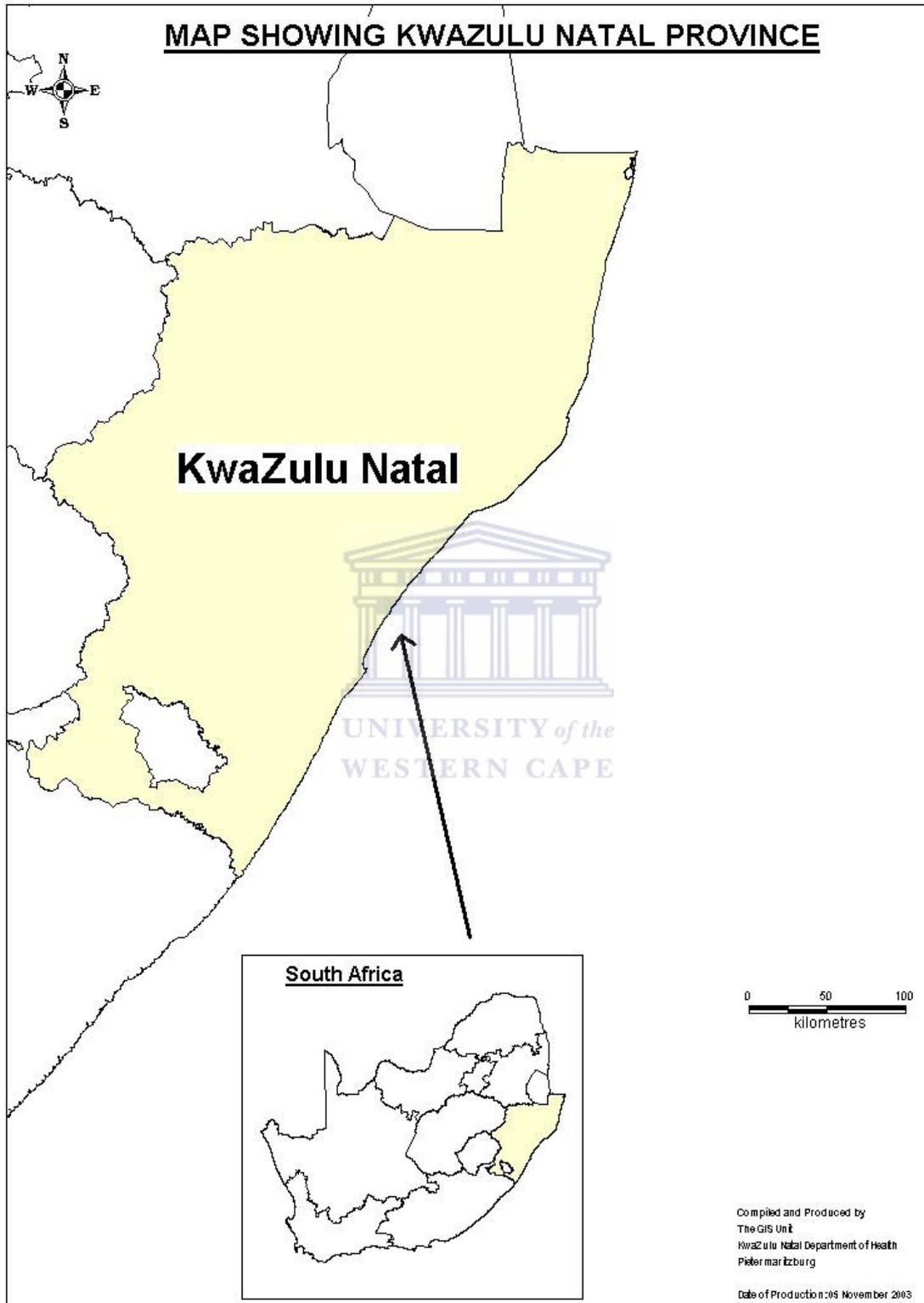
It is evident that these KPA's are equally applicable to all areas of general health and oral health, especially when one considers that oral health is essential to good general health. Oral health is strongly associated with both physical and mental health, with Leão et al., (2009) citing the Coulter et al., study wherein it was shown that a one-point increase in oral health was associated with a 0.05 ( $p < 0.000$ ) increase in mental health and a 0,02 increase in physical health ( $p = 0.031$ ).

## **Situational Analysis of the uMgungundlovu District, KwaZulu-Natal**

South Africa occupies the southernmost part of the African continent, and consists of a total landmass of 1 219 090 sq.km and a population of 49 320 500 (Stats SA, 2009). The country has common boundaries with Namibia, Zimbabwe, Lesotho, Mozambique, Swaziland, and Botswana. South Africa borders the Atlantic and Indian oceans. South Africa's geographical position thus allows many entry points for immigrants, and with South Africa's relatively strong economy many poor economic migrants from bordering countries flock to South Africa seeking work (2007/2008 Yearbook). The republic consists of nine provinces, and KwaZulu-Natal is the largest in terms of land mass and is the second most populous, with 21,2% of South Africa's population. KwaZulu-Natal stretches from the Mozambique border in the North to Port Edward in the South and with such a large coastline serves as a major tourist destination. The city of Durban in KwaZulu-Natal is home to Africa's busiest harbor.



**Map 1: KwaZulu-Natal Province**

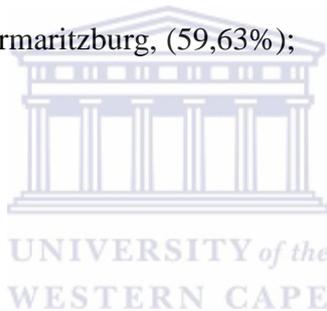


Map 2: Map of the uMgungundlovu District



The election of a new post-apartheid government saw the former province of Natal and the former “Bantustan” of Zululand being amalgamated into a “new” province. The province was divided into eleven health districts, with the metropolis of Durban forming a district on its own. The district of uMgungundlovu is the largest in terms of land mass and has just under one million people (995 303 – KZN Department of Health, 2009). The district serves seven local area authorities through 9 hospitals, 12 mobile clinics, 48 fixed clinics and four community health centers (DOH, 2009). The district has the major city of Pietermaritzburg, which is the capital of KwaZulu-Natal, and several smaller towns and villages. Seven of the districts hospitals are situated in Pietermaritzburg, with specialist hospitals being in Richmond (Richmond Chest Hospital) and in Howick (uMngeni Psychiatric Hospital). There are five private hospitals in the district, of which one is in Howick. The district has the following local area authorities, and the percentile population is indicated in brackets next to the name of the area:

- Msunduzi, including Pietermaritzburg, (59,63%);
- uMshwathi (11,64%);
- uMngeni (7,96%);
- Richmond (6,81%);
- Mkhambitini (6,37%);
- Mpofana (3,97%); and
- Impendle (3,62%).



A major road, the N3 National Highway, traverses the district and is a major source of disease transmission, as commercial sex-workers ply their trade at the Mooi River toll plaza, as well as along the N3. Statistics from the District Health Barometer, 2010, compiled by the KwaZulu-Natal Department of Health, reflect that the district has an area of 8 934 sq.km; a population density of 111 per sq.km, 88% of the districts people have access to piped water and there a poverty rate of 10%. In addition the report reflects that the HIV prevalence rate, as measured by ante-natal clinic attendance reports, is 27,7%.

## Political Context

*“The more we lack the courage and the will to act, the more we condemn to death our brothers and sisters, our children and our grandchildren. When the history of our times is written, will we be remembered as the generation that turned our backs in a moment of global crises or will it be recorded that we did the right thing?”*

– Nelson Mandela at 46664 Artie, in Tromsø, Norway on 11 June 2004.

South Africa entered a new political era in the 1990's, with the release of Mandela from prison, the unbanning of political parties, the writing up of a new constitution and the election of a new democratically government. The new government was too busy addressing the pressing political and economic needs and did not afford the HIV/AIDS epidemic the attention that was needed. The Mandela government began implementing the Primary Health Care system that resulted in many hundreds of thousands, if not millions, gaining access to both preventive and curative health care - health care that was never previously accessible.

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Post-Mandela saw the election of AIDS denialist President Thabo Mbeki in 1998 and with his rise to power the fight against HIV/AIDS epidemic was dealt with a crippling blow. By his refusal to accept the seriousness of HIV/AIDS and thus the refusal of an ARV roll-out, many hundreds of thousands of preventable infections and deaths occurred. However, nearer the end of Mbeki's ousting, and with the resignation of Health Minister Manto Tshabalala-Msimang, the face of the fight against HIV/AIDS changed. The new Minister of Health (Barbara Hogan) immediately put in various measures to improve the fight against HIV/AIDS, including an improved and upscaled ARV roll-out programme. The current President, Jacob Zuma, continued this fight with his plan of having 15 million South Africans undergo VCT within one-and-a-half years. In May 2006 the Deputy President tasked the National Department of Health with formulating a 5 year plan to combat HIV and AIDS, which was unveiled on 14 March 2007 at the National Consultation Conference.

The response to HIV and AIDS was not limited to direct medical treatment but also consisted of indirect responses such as stimulus in job creation and housing development, the empowerment of woman, etc. The new democratically elected government introduced two programmes aimed at improving the economy, these being the Accelerated Shared Growth Initiative for South Africa (ASGI-SA) and the Joint Initiative on Priority Skills Acquisition (JIPSA), (SA Yearbook, 2006-2007).

The response of the state to HIV/AIDS has been through two main policies, viz:

- The HIV and AIDS and STI Strategic Plan for South Africa 2007-2011 (which stems from the National Strategic Plan of 2000-2005) and,
- The Operational Plan for Comprehensive HIV and AIDS care, Management and Treatment. (HIV and AIDS and STI Strategic Plan for South Africa 2007-2011).



## **Policy**

A policy is defined as a “document setting out a department or organizations position on a particular issue” (Minaar and Bodkin, 2006). A policy is thus a set of guidelines to meet certain goals. In order to implement a policy one must have a “structured process of attempting to meet certain goals” (Minaar and Bodkin: 2006) through programmes (which are a portfolio of projects).

South Africa’s transition to a democracy in 1994 brought about numerous challenges in terms of narrowing racial disparities that existed within the health care sector (Benatar, 2004). Prior to the advent of apartheid the African National Congress recognised the importance of an effective health care system, and during the time in exile and whilst banned, the ANC retained the ideals of Primary Health Care, making primary health care a reality with the election of the ANC-led government in 1994. However, with South Africa facing a

catastrophic HIV/AIDS epidemic this ideal faces numerous challenges. Benatar (2004), states that “human health, patterns of disease, and life expectancy are profoundly affected by complex interactions among economic, social, and political forces, behavioural patterns, medical care, and the application of technology.”

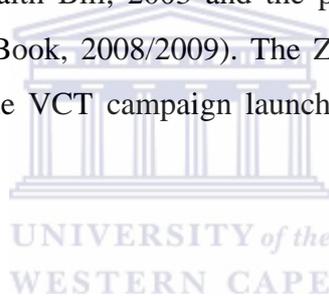
Benatar (2004), reported that the post-1994 government has done well in reducing some of these disparities. By 2009 this included the provision of access to clean water to 83,3% of the people, installed election provided 82,6% of households, provided RDP houses to 12,8% of the population, constructed hundreds of new clinics that provide primary health care, desegregated health services, made certain health services available free to certain groups of the population (such as expectant mother, children under five years of age) and developed new food programmes that reach over three million children (SA Year Book, 2008/2009; General Household Survey, July 2009).

However Benatar (2004), reported that the achievements have been downplayed by numerous shortcomings, and of course the terrible and adverse impact that the ravage of HIV/AIDS has on the population, and the economy, of South Africa. Many new clinics and even the existing district health care system are not fully or adequately functional, because of a lack of personnel and finances, maladministration and corruption, ever-increasing demand due to the increased burden of disease and the decrease in the number of medical personnel.

Van Wyk et al., (2010) reported that there has been a decrease in the number of newly qualified doctors graduating from South African medical schools, with 85 less doctors graduating in 2009 than when compared to 2004. This represents an enormous impact in the number of doctors in South Africa, as during this time the population increased by 12%. Crime, social drivers (the economy, cost of living, political changes, and increased workload being placed on medical staff, a freeze on recruitment and a myriad of other factors) have also had an impact on medical staff provision. Despite the valiant efforts of the post-1994 government there are numerous other factors that affect service delivery. The South Africa Year book (2008/2009), reported that 4,2 million more houses are needed; payment for services (example water, electricity etc.) is simply not made by large numbers of consumers,

a high unemployment rate (27%) which is rising, and massive job losses since 1995. The economic recession of 2008/2010 (and continuing) has also wreaked havoc with the economy, and South Africa's ability to fulfil the needs of the social determinants of health - which can only lead to a decline in the quality of health care provision and health status in South Africa.

Although South Africa has a comprehensive HIV/AIDS policy, this strategic plan, (the National Strategic Plan for HIV and AIDS and Sexually Transmitted Infection, 2007-2011), has had a low profile and was overshadowed, (until the removal of the Mbeki Government in 1998), by official denial of the relationship between HIV and AIDS. The effectiveness of this policy has been strengthened by various pieces of legislation (post-1994) such as the Choice of Termination of Pregnancy Act, 1996; Social Health Insurance Scheme, 1997; Medical Scheme Act, 1998; National Health Bill, 2003 and the proposed National Health Scheme (NHS) Act (South Africa Year Book, 2008/2009). The Zuma administration has instituted various interventions, such as the VCT campaign launched in April 2010, to combat and counter the effects of HIV/AIDS.



Benatar (2004) reported that for the 2003-2004 fiscal year the South African governments expenditure was R336 billion (30,4% of Gross Domestic Product) but only 11% (R37.1 billion) was spent on health care provision (primary, secondary and tertiary health care). This 11% of the budget would need to serve the health care needs of 80% (36 million) of South Africa's population. For 2008/2009 the South African government spent R65.8 billion (12,7% of GDP) on health; and planned to spend R80,8 billion (12,5% of GDP) on health in the 2010-2011 fiscal year. Benatar (2004), reported that in the 1970's ±14% of GDP was spent on healthcare, and thus lesser amounts of money are spent on health today than 30-40 years ago, despite the burden of HIV/AIDS. The state proposed to address this situation by expanding access to healthcare within a district-based system of primary health care, greater regulation of healthcare professionals including the ever-expanding compulsory community service requirements for an increasing number of medical and para-medical healthcare professionals, the nationalisation of health laboratory services and health promotion (Benatar, 2004; SA Yearbook, 2008-2009).

However the continued shortage of healthcare professionals continues to frustrate South Africa's ability to provide effective and efficient HIV/AIDS prevention and treatment programmes. South Africa is attempting to move healthcare professionals towards areas of need, through several direct (e.g. compulsory community service for newly-qualified health workers) and indirect measures (coercive – rural allowance, scarce skills allowance etc.). Benatar (2004), commented that the profile of South Africa's medical school enrolments is changing (with increasing numbers of black and female students). This reflected an increase from 28,9% of total first year medical school enrolments in 1994 to 60,3% in 2003), and in 2003 63% of new enrolments were female. The focus on healthcare provision for HIV/AIDS prevention and treatment is thus being thrust upon nurses, para-medical staff; community based healthcare workers, traditional healers and other quasi-medical practitioners.

The United Nations, through the World Health Organisation, has implemented various programmes in an attempt to reduce the number of new infections and to provide improved care to those already infected (Peterson, 2005). At the 5<sup>th</sup> World Workshop on Oral Health and Disease in AIDS, which was held in Phuket, Thailand from 6-10 July 2004, twenty-seven countries agreed that oral health was an integral part of general health and well-being. These countries issued a policy document, "The Phuket Declaration on Oral Health in HIV/AIDS 2004 – a commitment to action," which outlined various areas of concern, and supported the WHO Oral Health Programme, the aim being "a commitment to action," (Peterson, 2005). The World Health Organisation proposed a number of key element in comprehensive HIV prevention, and these are:

- AIDS education and awareness
  - Behaviour change programmes
  - Promoting condom usage
  - Voluntary counselling and testing
  - Prevention and treatment of STI's
  - PMTCT
  - Community education, policy change
- (WHO/UNAIDS, 2004)

Jackson (2002), stated that it is critical to have an established national policy around AIDS concerning employment, discrimination and other areas. South Africa has a national strategic policy that focuses on a number of focus groups, these being vulnerable children and orphans, prisoners, sex-workers and the youth. Areas of policy concern include HIV treatment access, voluntary counselling and testing, wilful transmission and rape, notification and consent (Jackson, 2002).

While the national multi-sectorial response to HIV and AIDS is managed by different structures at all levels, with provinces and local authorities being the main implementing bodies, the South African National AIDS Council (SANAC) exercises overall guidance, support, monitoring and political direction at a national level (NSP, 2007-2011). The SANAC identified four Key Priority Areas (KPA's) for inclusion in South Africa's policy, and these are:-

- Prevention
- Treatment, care and support
- Human and legal rights
- Monitoring, research and surveillance



(Source: NSP 2007-2011)

South Africa has developed policies that include “multi-sectorial, national strategic plans” to directly address the HIV/AIDS epidemic (Zungu-Diwari et al., (ed.) 2004), and to deal with the prevention and care of People Living with HIV and AIDS (PLWA). In South Africa serious constraints have been identified in the implementation of HIV and AIDS policies, strategies and programmes, (Zungu-Diwari et al., (ed.) 2004), and these constraints include finances and human resources (adequately trained staff, including medical, counseling and support personnel, care-givers etc.). The provision of services such as VCT and PMTCT are inadequate in rural areas, and the fear of stigmatization and discrimination, and traditional cultural norms continue to impede the effective provision of care and support to those infected by HIV and AIDS.

In order to put in place a policy dealing with the oral manifestations of HIV/AIDS there should be a policy dealing with the treatment and prevention of HIV/AIDS. If not then the policy dealing with the oral manifestations of HIV/AIDS will be ineffective and a waste of resources. The policy should encompass the following (van Wyk, 2007):-

- A comprehensive peer-education programme.
- An intensive voluntary counseling and testing (VCT) campaign.
- An effective communications strategy.
- The resources required to provide on-going treatment and support for those infected (and affected) with/by HIV/AIDS.
- Effective targeted condom distribution programmes.
- Stake holder buy-in (the state, NGO's, community and religious sectors, the masses etc.).

The UNAIDS core recommendations for HIV prevention and care in sub-Saharan Africa include those listed above as well as the following:

- 
- Syndromic treatment of STI's
  - Palliative care
  - Psychological and social support
  - Nutritional care and counseling (Jackson, 2002).

Van Wyk (2007) also goes on to argue that the barriers that are in place to effective treatment and care provision need to be eliminated. These include (but are not limited to):-

- Stigma
- HIV/AIDS fatigue – from hearing the same message over-and-over again.
- Frozen groups – who believe that “it won't happen to me” and “I am not at risk because....” etc.

## Human Resources

*“The health systems are not functioning.....because the human resources are not functioning,”* David Saunders, Head - School of Public Health, University of the Western Cape.

HIV and AIDS affect both the supply and demand of health care professionals. On the “supply” side health care workers also get infected and on the “demand” side the increase in the number of HIV positive patients requiring care increases the patient workload of these healthcare workers.

The workload of the limited oral health care personnel has been expanded by the introduction in 1994 of free oral health services at public PHC facilities and this policy has resulted in an increase in patient attendance although the number of personnel has remained fairly stable (Bhayat et al., 2008). South Africa has always faced a shortage of health care professionals within the public sector. Despite numerous initiatives (e.g. changing the racial intake profile at medical schools, the “importation” of Cuban and other national doctors, the sending of South Africans to Cuba to study medicine, the introduction of the mid-level oral health care worker (e.g., the dental therapist) South Africa still continues to experience a shortage of health care workers. The National Human Resources for Health Planning Framework has been central in trying to combat the challenges facing the healthcare system in general, with particular attention being paid to the recruitment, training and retention of health care workers. The Department of health has even considered the introduction of year-long compulsory community service (CCS) and rural allowances for scarce skills in an attempt to lure dental therapists into public practice (Bhayat et al., 2008)

The South African government has even gone to extraordinary lengths to retain health care professionals, such as signing agreements with foreign countries to stop recruiting South African health care workers, introducing rural and scarce skills allowances and even the paying of the recently announced occupation specific dispensation (OSD) payments. However these steps and initiatives have little effect on health care professionals retention. Many health care workers leave the public sector because of a lack of resources

(accommodation, medicines, equipment etc.) as well as because of other factors such as being overworked, affirmative action, incompetent management etc., challenges still exist, however, in trying to get healthcare workers to work in rural areas – areas where they are often needed (Nursing Strategy for SA – 2008).

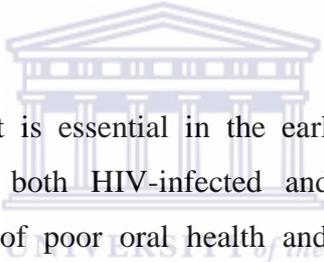
The oral and general health workforce faces a serious challenge, a challenge which is posed by the HIV/AIDS epidemic itself. Shisana et al., (2004), reported that in Malawi in 1999, two percent of all health workers died of AIDS (60 out of 2 979), with the highest number of these deaths occurring in females aged 25-34 years. Buve et al., (1994) reported of the deaths in female nurses in Zambia there was a 26,7/1000 HIV/AIDS mortality death rate in 1991. Shisana et al., (2004) reported that an estimated 17,5% of health workers in four provinces in South Africa employed in both the public and private sectors were living with HIV or AIDS in 2002 and that the prevalence rate was much higher among 18-35 year old health care workers, being 20%, while professional healthcare workers were found to have a 13,7% prevalence rate. The prevalence rate in KwaZulu-Natal was 17,1%. With so many younger health workers being affected, especially seeing that large sums of money and other resources go into the training of these health workers, the future of human resources for health provision seems bleak. This places challenges on both current staff levels as well as the need for vigorous human resource planning to replace healthcare workers who die from AIDS.

## **Oral Health and General Health**

*“Health is not merely the absence of disease but a state of total well-being”*– World Health Organisation, (1948).

Oral health is integral to general health and is essential to well-being and quality of life (Leão et al., 2009), with socio-behavioural and environmental factors playing significant roles in the manifestation of oral diseases (Naidoo and Myburgh, 2007; Sheiham, 2005). “Oral health means more than good teeth; it is integral to general health and essential to well-being”

(Petersen, 2005). The interrelationship between oral health and general health has been shown, with, for example, severe periodontal disease being associated with diabetes. Johnson et al., (2006), reported that the interactions between oral health and general health are bi-directional and involve many complex interactions, which often “profoundly influence the progress of many disease,” the quality of life, job performance and economic contribution of HIV-infected individuals. The “significant role of socio-behavioural and environmental factors in oral disease and health” has been demonstrated in a number of epidemiological surveys (Peterson, 2005). The majority of oral diseases are related to life-style and reducing the incidence and prevalence of these “mostly chronic diseases” relies on changing behaviour (Peterson and Kwan, 2004). Oral health is strongly associated with both physical and mental health, with Leão et al., (2009) citing the Coulter et al., study wherein it was shown that a one-point increase in oral health was associated with a 0.05 ( $p < 0.000$ ) increase in mental health and a 0.02 increase in physical health ( $p = 0.031$ ).



Therefore oral health assessment is essential in the early diagnosis of HIV, and in the comprehensive management of both HIV-infected and HIV-affected individuals, and communities. The determinants of poor oral health and disease include diet, poor oral hygiene, alcohol, smoking, risky behaviour (including fighting, violence and increasingly HIV/AIDS infection) (Sheiham, 2005; Peterson and Kwan, 2004), and it is interesting to note that these determinants also have a negative impact on general health.

The effects of poor oral health are manifested physically, physiologically and socially (Sheiham, 2005), and have an influence on their development: enjoyment of life; looks (physical appearance); eating patterns (chewing, taste, food choices); social habits; feeling of social well-being; sleep disruption; high treatment costs; impact on work and school absence and even their ability to enjoy life. Studies in Brazil reported that 33% of adolescents experienced dental pain; and in Thailand 74% of 35-44 year olds reported that dental problems affected their daily performance and 46% reported that dental problems caused emotional instability (Sheiham, 2005).

Poor oral health thus affects general health in a number of ways. The presence of caries affects eating patterns and habits, nutrition, growth and weight gain, metabolic processes (disturbed sleep affects glucocorticoid production), and leads to suppression of haemoglobin due to depressed erythrocyte production (Sheiham, 2005). Adulyano (1996) reported that dental problems caused chewing to be painful and affected the intake of dietary fibre and certain nutrient-rich foods resulting in lower serum levels of nutrients such as vitamin C, folate and beta carotene. Oral health and nutrition have a “synergistic relationship, (Naidoo and Myburgh, 2007).” Oral lesions are among the first symptoms of HIV infection, and the magnitude and impact of HIV-associated oral disease on dietary intake and nutritional status is well-known (Naidoo and Myburgh, 2007).

Yengopal and Naidoo (2008) conducted a study in South Africa and stated that:-

*Oral lesions associated with HIV infections should be considered as debilitating to the patient and an overall treatment strategy.....should include the management of oral conditions associated with HIV infections.*

The relationship between oral care and nutrition has been clearly established (Naidoo and Myburgh, 2007).

Health outcomes of HIV/AIDS treatments in terms of longevity have shown great success and the net result of the success of these improved HIV/AIDS treatments is reflected in the quality adjusted life year (QALY), and in terms of improved Health Related Quality of Life (HRQL) (Shetty, 2004; Robberstad and Olsen, 2010).

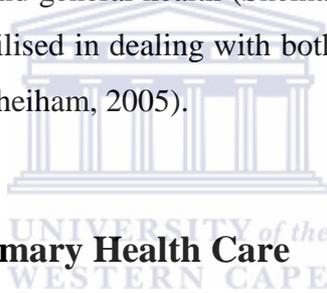
Hughes et al., (2004) have reported that health related quality of life is severely compromised in Stage III and Stage IV patients, and compared the quality of life of HIV-infected patients in a primary health care setting in Khayelitsha, Cape Town not on ART to the quality of life of the general population. A main finding was that people with HIV experienced significantly greater limitations in all five dimensions of health (mobility; self-care; usual activities; pain/discomfort; anxiety/depression). In a comparative study, wherein the subjects were HIV infected and on ART therapy, Hodgson et al., (2006) found that, even in resource-poor

settings the quality of life of these persons when measured across the five dimensions of health were significantly better. Louwagie et al., (2007) reported that the impact of ART on the quality of life is also shown in the Free State province in that patients waiting to start ART commonly reported health problems such as pain/discomfort (in 57% of the study population), and 42% experienced depression/ anxiety. Other studies, by McInerney et al., (KwaZulu-Natal, 1999) and Nuwagaba-Biribonwoha (Uganda, 2006) concurred with these findings. Poor oral health impacts on the quality of life of people living with HIV/AIDS, and oral diseases may cause significant oral pain and discomfort that may lead to problems with eating and poor nutritional intake, with the resultant overall decline in the health status of persons infected with HIV/AIDS (Yengopal and Naidoo, 2008).

Various studies have indicated that patients living with HIV/AIDS have indicated the effect of HIV on oral health affects the quality of daily life and its activities (Ssali, 2000; Yengopal and Naidoo, 2008). Ssali (2000) in a study in Kampala, Uganda, showed that women living with HIV/AIDS even had more problems with eating, cleaning teeth and sleeping due to oral health problems when compared to women who were HIV negative. Oral diseases can thus cause significant impairment in the quality of life of affected persons (Reichart 2006; Porter 2006).

Leão et al., (2009) stated that the presence of oral lesions can have a significant impact on health-related quality of life. Coates et al., (1996) reported that patients with HIV/AIDS experienced more oral discomfort than the general population and that treatment for HIV/AIDS resulted in a measurable symptomatic improvement, which led to an overall improvement in both physical and mental health. This clearly indicates that if patients were to access early diagnosis of HIV and appropriate medical intervention, they could experience a significantly improved quality of life. Therefore it is vitally important to integrate oral health assessment and care into the practices of all medical and paramedical health care providers (Ssali, 2000). Nutritional intake is impaired by the lack of knowledge of nutritional oral intake and has an important influence on a person's health. It has been postulated that infections such as pneumonia are also caused by oral pathogens micro-organisms (Limeback, 1998). The nurse must be able to recognise key features of oral disease and know when to refer the patient for medical/dental opinion (White, 2000).

HIV/AIDS not only affects the infected individual, but also has a significant impact on family, friends and care-givers. Wight (2001) reported that due to recent innovations in medical care such as antiretroviral therapies and prophylaxis for severe opportunistic infections, more HIV positive individuals are living for longer periods, and that this protracted timeline of care for the ill HIV positive patients has come to resemble that of the chronic care of frail elderly persons. Many authors concurred with the finding that caregivers experience “non-specific psychological distress, depression and physical ailments” in levels that are far greater than those found in the general population (Aneshenel and Mullan, 1995; Wight, 1993; Baumgarten, 1989). The caregivers and the patient may also experience episodes of anger and shame. Wight also found that caregivers may have to review their own personal goals and pursuits, because they are “consumed by the demands of care giving”. This has a negative effect on the quality of life of the caregivers. Other chronic diseases, such as obesity and diabetes, are increasing in developing countries and may lead to a reduction in both quality of life and general health (Sheiham, 2005). Therefore the common-risk factor approach should be utilised in dealing with both oral health and general health as they have similar determinants (Sheiham, 2005).



## **The Role of Nurses and Primary Health Care**

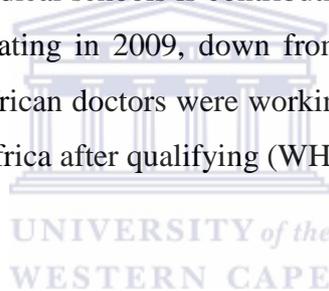
The Alma Ata Declaration was signed in 1978 and had the ambitious target of achieving ‘Health for All’. Representatives from 134 countries gathered in what is now Kazakhstan and they declared that Primary Health Care “*based on practical, scientifically sound and socially acceptable methods and technology made universally acceptable through people’s full participation*” was key to delivering ‘Health for All’ by the year 2000. South Africa was not one of the countries that signed the declaration, as in 1978 our country was a pariah state (Schaay and Sanders, 2008). With the demise of apartheid and the election of a democratically-elected government in 1994, the new government lost no time in making Primary Health Care the centrepiece of its health strategy. Both the White Paper on the Transformation of the Health System, formally endorsed by Parliament in 1997, and the National Health Act of 2004, envisaged that the focus of the national health system would be Primary Health Care, delivered through the district health system (Schaay and Sanders, 2008).

Primary Health Care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community (Declaration of Alma Ata, 1978). The restructuring of the health system to ensure that equitable health care was provided to all in South Africa was instituted by the new government (HST, 2002). South Africa faces a major crisis in terms of human resources for health. There is a shortage within the country, coupled with a mal-distribution between provinces, as well as between the public and private sectors.

In South Africa there is an integrated approach to primary health care service (PHC) delivery. This change, from a hospital centred approach to a primary health care approach, required a modification in nursing practices, education and training (Nursing Strategy, 2008). PHC nurses were now expected to integrate preventive care with curative services (Strasser et al., 2005). As a result the nurses in PHC clinics are multi-skilled and are required to multi-task. Thus nurses do not work solely with PHC patients, but are expected to screen all patients and to either treat or refer these patients to other health care workers, e.g., medical officer, dentist etc. Multiple responsibilities, together with the growing patient loads in the face of the HIV epidemic, often result in overworked nurses at a PHC level. This directly and indirectly impacts negatively on the time spent in examining, diagnosing and treating PHC patients. This inefficiency may manifest in a failure to correctly diagnose and appropriately treat patients, insufficient time being spent on health education for patients, a failure to correctly record and refer oral health cases. In addition overworked PHC nurses are unlikely to have sufficient time to monitor oral health in the community.

The health workforce is a major input in the production of health care within the health system. According to the World Health Organization (UNAIDS, 2008), “at the heart of each and every health system, the workforce is central in advancing health”. Producing, recruiting and retaining health professionals remain key challenges facing, but not confined to, South Africa as these have been documented as challenges for the entire Southern African region and globally. The human resources for health (HRH) crisis limits growth within both sectors and raises fundamental questions around the future direction of the health system, especially in light of the vision in the National Health Act (Act 61 of 2003), and the unfolding Health Charter process, which seek to unify a segmented health system.

The nursing profession comprises the largest category of health care professionals in South Africa, with 111 299 registered nurses, 48 078 enrolled nurses and 62 440 nursing auxiliaries (total nursing population of 221 817) as at 31 December 2010 (SANC, 2010). Nursing in South Africa is facing serious crises due to serious challenges facing the health system. A number of studies indicate that low remuneration and poor or deteriorating working conditions top the list (Nursing Strategy for South Africa, 2008). This has, to a large extent, manifested as a decline in the standards of nursing care and general quality of life, in both the public and private health care facilities. The Nursing Strategy (2008), recognised that nurses are an essential component of health care delivery, but the challenge facing the country is that there are not enough nurses to address the health care demands being placed upon the health care system. The transformation of South Africa's health care system has undergone rapid transformation with more emphasis being placed upon nurses to treat, diagnosis and refer patients, especially with the shortage of medical doctors. The declining throughput of medical graduates from South African medical schools is contributing to the stress being placed upon nurses, with 1306 doctors graduating in 2009, down from 1394 in 2004 (van Wyk et al., 2010). In 2004, 37% of South African doctors were working outside the country and 17% of doctors planned to leave South Africa after qualifying (WHO, 2004).



## **Nursing Education**

Nursing education plays a vital role in ensuring a constant supply of highly educated nurses, but with the South African Qualifications Authority (SAQA) demanding that the only qualification recognisable for registered nurses is the Degree qualification (which can only be issued by a university or a university of technology, the shortage of registered nurses will be exacerbated (SANC, 2010).

The South African Nursing Council (SANC) diploma in Clinical Nursing Science, Health Assessment, Treatment and Care is seen as the “gold standard” in attaining competency in primary health care (Strasser et al., 2005) yet the vast majority of nurses working in PHC clinics do not possess this qualification. Drennan (2002) is cited by Strasser et al., (2005) who found in a rapid audit study of PHC nurses in KwaZulu-Natal that only 22% were diploma trained.

Numerous studies have found that nurses lack the necessary knowledge of oral care (Southern, 2007; Boyle, 1992; Adams, 1996), and education in oral care (Sweeny et al., 1996). Prevention of oral complications and providing thorough oral care can prevent life-threatening infections and provide greater comfort for patients. However various studies suggest that nurses dislike providing oral care and Southern (2007), offers the following reasons for this dislike; lack of knowledge, lack of time, low staff levels and unpleasantness of the task. Nurses knowledge of oral health problems is often limited (Longhurst, 1998) and this is often due to the absence of oral health education at the prequalification stage.

Adams (1996), found that 85.3% of nurses in the United Kingdom (UK) had not received any oral care education since qualifying. A review of nursing education in the UK shows that only 28% of nursing schools provided education in oral assessment, 38% provided no entire lectures in oral care and 70% had no dental input in oral health care. Hodgson et al., (2006), reported that there exists a need to train nurses in the recognition of specific oro-facial lesions that play an important role in identifying HIV infected patients. Early diagnosis of these lesions is essential for optimal treatment. While this study aims to assess the level of Primary Health care nurses knowledge and practices in the early identification of HIV predictive oral lesions it must be noted that there may still exist a need for PHC nurses to be trained in understanding that certain oro-facial lesions are strongly associated with HIV disease progression and can also serve as prognostic markers in resource poor countries (Hodgson et al., 2006).

There is a need to train HCW's in the recognition of the specific oro-facial lesions that play an important role in identifying HIV in a person. (Hodgson et al., 2006). Early diagnosis of oro-facial lesions is essential for optimal treatment, while this study aims to assess the level of PHC in the diagnosis plus early identification of HIV predictive oral lesions, it must be noted that there may exist a need for PHC nurses to be trained in the understanding that some oral facial lesions are strongly associated with HIV disease progression plus can serve as prognostic markers in resource poor countries (Hodgson et al., 2006). Pending further research oral hairy leukoplakia (OHL) may even be used as a surrogate marker for the initiation of ARV's (Hodgson et al., 2006).

A review of nursing practices revealed that oral assessment and care receive minimal attention (Ridley and Pear, 2008). Nurses should be trained to assess the mouth for thrush, as if left undiagnosed and untreated, these lesions can become very painful and will interfere with the oral intake of (and thus overall nutritional health) the patients further compromising health (Ridley and Pear, 2008; White, 2000). In clinical practice oral health and oral hygiene is often not regarded as a priority (White, 2000) and there may be a lack of oral health assessment protocols. Nurses knowledge of OH is often limited (Longhurst, 1998) and this is often due to the absence of oral health education at the prequalification stage. (Boyle 1992). This is supported by others such as Adams (1996), Longhurst (1998) and Fitch et al., (1999) who found that by training nurses in oral health plus implementing oral care protocols, the oral health status of patients could be improved.

White (2000) found that nurses in the United Kingdom are inadequately trained in oral health assessment. Longhurst (1998) found that in the UK in a survey of 162 nurse training schools many had syllabus deficiencies; with 79% having no dental input and 38% not having any lectures on Oral Health Care. Longhurst (1998) also found that key nursing textbooks contain insufficient information about oral diseases and suggests key textbooks, journal articles and specific oral health information guides to improve nurse's knowledge on the disease. Adams (1996) reviewed the literature and conducted surveys of nursing staff knowledge on oral health matters and also concluded that oral health care is generally a neglected area of nursing.

## **Categories of Nurses**

Nursing has a complex hierarchical structure which has been complicated further by recent legislative change governing the profession and its education programmes (Brier et al., 2006). The South African Nursing Council (SANC) a statutory body in term of the Nursing Act 1978 to which all nurses in SA have to register with, maintain two different registers: one a register for nurses who have a 3 year Diploma or a 4 year degree qualification or qualified via a bridging programme and the other for nurses with a lesser qualification (Brier et al., 2006).

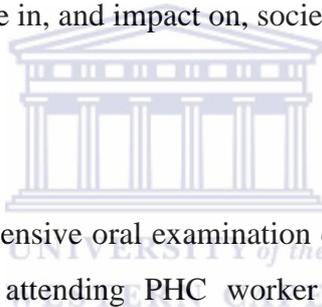
In the Nursing Act of 2005, (Act No. 33 of 2005), new categories of nurses were presented, (Professional Midwife, Staff Nurse, Auxiliary Nurse) and also revised the scope of practice of nurses. This reflected a new approach to nursing education, which although not yet been implemented, is aimed at training nurses to be better prepared for PHC setting. (Brier et al., 2006; DOH, 2008).

Nurses make up 50% of the professional human resources of health services in South Africa, and provide the bulk of the healthcare services in the public sector (Brier et al., 2006; van Rensburg and van Rensburg, 1999). The growth of the number of nurses has slowed over the years. In the 10 years between 1996 and 2006 nursing displayed a 14,1% overall growth while the general population grew by 17% (Brier et al., 2006). There was an estimated 157 501 active nurses registered in 2005, which represents 82,3 % of the total registered. A PHC nurse is a RN/PN who has been comprehensively trained or has a post basic qualification in community health. (DOH, 2008). For the purpose of this study primary health care nurse will mean any nurse, no matter what his/her qualification is, who assesses and is involved in the diagnosis and treatment of patients, no matter how minor the role is. Uys (2000) writes that every nurse should determine the client's problem (Assessment), plan to solve the problem (Planning), execute the plan (Implementation), and to determine whether the plan has been resolved (Evaluation).

In SA a myriad of factors, including a limited oral health workforce, limited financial resources and a lack of infrastructure, has contributed to poor oral health within the community (Hodgson et al., 2006). The *Dakar Report* (a regional oral health strategy for African nations), recognised the significant burden of HIV (Hodgson et al., 2006). Studies in Sub-Saharan Africa reveal that within the black population (and especially so in rural areas and areas that are subjected to extreme poverty, there is limited access to, and utilization of, dental care (Westaway et al., 1999). PHC workers often fail to assess/fail to diagnosis/misdiagnosis oral diseases and HIV pre-indicative conditions. This early recognition of oral disease and HIV infection is invaluable (Knight, 2003).

## Oral health assessment practices

Early recognition and correct identification of infectious disease in the oral cavity is especially important, as this can lead to the appropriate referral of patients with lesions suggestive of serious diseases such as HIV, and this is essential in the practice of primary health care (Sheiham, 2005). Knight (2003), argued that “the compartmentalisation involved in viewing the mouth separately from the rest of the body must cease” because poor oral health affects general health, through pain and suffering, diet modification, difficulties in proper word formation and articulation, and in general health.” Poor oral health even has an effect on other chronic diseases, with research indicating that poor oral hygiene and increased micro-flora levels in the mouth could be responsible for certain conditions. Oral diseases are among the more common chronic diseases, and are thus common public health problems, mainly because of their prevalence in, and impact on, society (Sheiham, 2005; Peterson and Kwan, 2004).



It should be noted that a comprehensive oral examination can provide more than 80 possible diagnoses (Knight, 2003). The attending PHC worker can easily treat some of these conditions. The PHC nurse should do both a systematic examination of the lips, dentition, oral mucosa, tongue, palate, pharynx and floor of the mouth as well as an assessment of the head and neck (Knight, 2003). Care of the mouth is considered to be one of the most basic of nursing activities. However during the initial examination of the patient scant attention is paid to the oral cavity unless the chief complaint is about the oral cavity, and thus an excellent opportunity to address any one problem is missed (White, 2000).

Fitch et al., (1999) found that in the USA few nurses were formally trained in addressing oral health, and that oral health protocols were rare. The conduct of oral health care should be defined in a protocol which sets out procedure, frequency and follow-up (including referral procedures). An important step is to implement these protocols, and White (2000) and Boyle, (1992), have proposed a strategy for oral health care case assessment. This “health promotion strategy” has five important principles:-

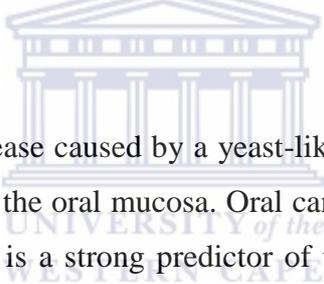
- An oral health assessment policy – to be used by all grades of nursing.
- A continuing education policy for nurses (Boyle, 1992).
- A word based policy.
- A multidisciplinary team approach to mouth care (involving nurses, oral health care workers, occupational therapists, dieticians etc.).
- Improved referral and feedback mechanisms.

## **Oral Manifestations of HIV/AIDS**

The oral manifestations of HIV/AIDS, especially oral candidiasis, are a common feature of HIV disease, suggesting that compromised mucosal immunity within the oral cavity is a consequence of viral infection, and that oral cellular immunity and humeral immunity is also affected by HIV infection. However the latest research by McCulloch et al., (2011) as cited by Coogan and Challacombe (2011), suggests that in the post-ART era oral candidiasis is no longer diagnostic of disease progression. Many viruses, bacteria, fungi and parasites can colonise on the mucosal surfaces subsequent to the development of HIV infection (Challacombe and Naglik, 2006). It is reported in numerous studies, (Arendorf et al., 1998), that HIV infection is conducive to many oral lesions. HIV infection presents a panorama of mucocutaneous manifestations, many of which may be the presenting feature of the disease (Ferreira et al., 2007; Fauci and Lane, 2001). Chidzonga (2003) reported that oral lesions may be predictive of the progression of the HIV disease and may be useful in the staging and classification of HIV and AIDS. Leão *et al* (2009) and Ranganathan and Hemalatha (2006) also reported on oral manifestations being among the earliest and most important indicators of HIV infection.

Shobana et al., (2004), examined 410 patients, and found that oral candidiasis (36%) was the most common oral manifestation, followed by gingivitis (13%), with other oro-mucosal lesions having a prevalence of below 5% (Herpes Simplex - 5%; oral hairy leukoplakia - 3%; angular cheilitis - 1%), and found that 40% of HIV-seropositive patients had oral manifestations. Ferreira et al., (2007), reported on a study conducted in Rio De Janerio,

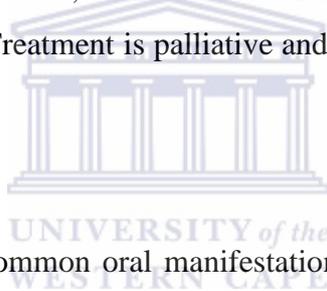
Brazil that 45% of patients studied presented with oral manifestations of HIV, with 19.5% diagnosed with pseudomembranous candidiasis, 14.2% with erythematous candidiasis, 7.4% with oral hairy leukoplakia, 6.7% with angular cheilitis, 39% with Kaposi's sarcoma and 1.9% with herpes simplex. Many of these lesions that occur in HIV infected people can easily be examined/assessed, as they are readily accessible, and during an oral examination these oral manifestations can play a role in the diagnosis and staging of the infection (Knight, 2003; Hodgson et al., 2006). Greenspan and Greenspan (2002) proposed that oral examination of all individuals at risk of infection, potentially infected and diagnosed as being HIV positive by health care workers at each clinical interaction should become mandatory. The presence and development of oral lesions are used as entry and exit points for prophylaxis, therapy and vaccine trials. Ferreira et al., (2007) reported that common sites of oral infection in HIV patients are the tongue (29,5%), palate (20,9%), lips (13,6%), buccal mucosa (13,4%), gingival (13,4%) with 5,7% of lesions appearing on the floor of the mouth. Some of the more common oral manifestations are discussed below.



ORAL CANDIDIASIS – is a disease caused by a yeast-like fungus *candida albicans*, and is the most common white lesion of the oral mucosa. Oral candidiasis is one of the earliest oral manifestations of HIV/AIDS and is a strong predictor of the subsequent risk of HIV/AIDS related illness and death (Egusa et al., 2008). This is because immune suppression is the hallmark of HIV infection, a feature of which candida takes full advantage of (Challacombe and Naglik, 2006). Oral candidiasis is one of the mostly common oral manifestations of HIV, occurring in 50% of untreated HIV-infected patients and 90% of AIDS patients (Shobana et al., 2004). Oral candidiasis is a collective term given to a group of oral mucosal disorders caused by fungal pathogens belonging to the genus *candida* (Egusa et al., 2008). The association of oral candidiasis and HIV infection has been known since the advent of the HIV/AIDS pandemic (Egusa et al., 2008). Oral candidiasis is frequently asymptomatic and is often the earliest recognised sign of opportunistic infection, and should be considered as possible evidence of immune-compromise (Knight, 2003), and Knight reports that oral candidiasis will likely affect 75% of HIV infected individuals at some point in the disease course. Oral candidiasis may affect the lips (with erosion of the labial commissures and considerable inflammation), or a white plaque (which is easily removed) which may appear on the surface of the oral mucosa, tongue and pharynx (Knight, 2003). Eating becomes painful and the tongue and oral mucosa often are dry, burning and painful. The severity and

prevalence of oral candidiasis increases with advancing immune suppression, making it an important predictive sign for the subsequent development of AIDS (Ferreira et al., 2007; Klein et al., 1984). The four distinct clinical variants of oral candidiasis in HIV are pseudomembranous candidiasis, erythematous candidiasis, hyperplastic candidiasis and angular cheilitis, and it is possible for all four variants to appear simultaneously in the same patient (Challacombe and Naglik, 2006).

ORAL HAIRY LEUKOPLAKIA – is seen primarily in HIV-positive patients and often precedes the clinical diagnosis of HIV (Knight, 2003). Oral hairy leukoplakia presents as a painless, white lichenous, plaque-like lesion and is most commonly seen on the lateral surfaces of the tongue (Knight, 2003). It may initially resemble oral candidiasis, but cannot be scraped off, unlike thrush which is easily scraped off. The lesion appears as a raised white feathery/corrugated area of the mucosa, with the sides of the tongue being the most frequent site of infection (Knight, 2003). Treatment is palliative and may include the administration of the drug acyclovir.



KAPOSI'S SARCOMA – is a common oral manifestation of HIV, and occurs in  $\pm 15\%$  of males and less frequently in female HIV positive patients (Knight, 2003; Bickley et al., 2003). These reddish-purple asymptomatic macules progress into papules, and finally progress to an exophytic stage. In this latter stage Kaposi's sarcoma lesions become painful and interfere with eating (Knight, 2003). Treatment involves the surgical excision of the lesion.

Other oral manifestations of HIV and AIDS include non-Hodgkin's lymphoma, aphthous ulcers, rampant caries and periodontal diseases (particularly ANUG) (Ferreira et al., 2007, Chidzonga, 2003). Bhayat (2007) reported that in two clinics in Gauteng he found a strong link between HIV status and the presence of oral lesions, as indicated in the table below:

**Table 1: The association between the HIV status and the presence of certain oral lesions using logistic regression**

No.	Variable	Odds ratio	Confidence Interval (95%)	P-Value for logistic regression
1	Angular Cheilitis (Yes/No)	7.1	1,5-34,6	<b>0.015</b>
2	Pseudomembranous Candidiasis (Yes/No)	2.0	1,3-3,0	<b>0.002</b>
3	Erythematous Candidiasis (Yes/No)	3.3	1,6-6,1	<b>0.000</b>
4	Oral Hairy Leukoplakia (Yes/No)	19.5	5,8-65,2	<b>0.000</b>
	<i>CONSTANT (HIV STATUS)</i>			

Source: (adapted from Bhayat (2007)).

From the table above it can be seen that these four lesions were significantly associated with ( $p < 0.05$ ) with the presence of HIV, meaning that patients who presented with these lesions were more likely to test positive for HIV when compared to those who did not present with these lesions.

### **Oral Conditions as Pre-Indicators of HIV Infection**

A comprehensive and thorough search of both the electronic databases and a hand search of written literature yielded abundant literature on the value of oral mucosal lesions as a pre-indicator of HIV infection. The mouth may be the first site of disease ((Leão et al., 2009; Hodgson et al., 2006; Ranganathan and Hemalatha, 2006) and some of the more than 40 oral lesions associated with HIV may be the “first features of HIV/AIDS” (Agbelusi and Wright, 2005; Arendorf et al., 1998; Greenspan and Greenspan, 1997). A number of studies have shown that between 35-90% of HIV infected persons present with at least one oral lesion during the course of their infection and oral lesions may also indicate poor prognosis and/or

deterioration in general health (Ranganathan and Hemalatha, 2006; Agbulusi and Wright, 2005; Arendorf et al., 1998). Oral mucosal lesions identified during the examination of an asymptomatic at-risk individual may be consistent with underlying immunosuppression (Agbelusi and Wright, 2005; Arendorf et al., 1998; Greenspan and Greenspan, 1997). Various studies (Greenspan and Greenspan, 1997; Greenspan and Greenspan, 2002; Shiboski et al., 1994; Klein et al., 1984) have indicated that the “presence of oral candidiasis and oral hairy leukoplakia and Kaposi’s sarcoma” strongly suggest HIV infection. Lewis et al., (2003) supported these findings, and includes other non-oral clinical signs that may be indicative of HIV infection, such as hair loss. Johnson et al., (2006) found in a study of 100 HIV positive Zimbabweans that 92 had oral lesions. The most common lesions found were oral ulcerations (66), followed by Kaposi’s sarcoma (72) and oral candidiasis was noted in 22 patients. In a study done by Badri, Martins and Wood in 2001 on a cohort of 772 HIV positive patients who had attended adult HIV clinics in Cape Town over a six year period (1992-1997), it was found that the presence of oral candidiasis and oral hairy leukoplakia provided prognostic information, and could be used as a cost-effective tool for screening patients in resource limited settings (Bhayat, 2007). Schiódtt et al., (1990), in a study conducted in Tanzania showed high (85%) positive predictive value for underlying immunosuppression in patients undergoing routine oral examination at a dental clinic who presented with HIV predictive oral mucosal lesions and were subsequently tested positive for the HI virus.

Various studies conducted in North America, Africa and Europe in adult subjects illustrated that oral conditions are often the presenting sign of HIV infection and that there is a strong association between the presence of oral lesions and the patients HIV status. These studies, as presented by Bhayat (2007) are illustrated in the Table 2 below:-

**Table 2: Studies reporting on the prevalence of Group I oral lesions in HIV positive patients.**

**Table 1. Studies reporting on the prevalence of Group I oral lesions in HIV positive patients**

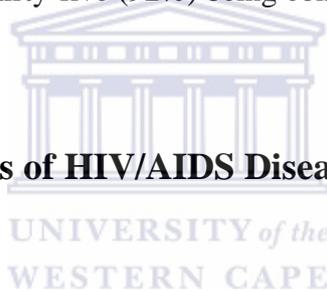
Author/s	Participants	Study design	Sample Size	Prevalence of oral lesions	Results (prevalence rates)	Setting
1 Ranganathan et al 2004	HIV positive patients over 18 years old. 77% Males and 23% Females	Cross sectional analytical study	1000	86.6%	OC-24%, AC-7.9%, OHL-2.1%	ASIA South India
2 Nitayananta et al 2002	HIV positive patients between 16-65 years old who attended a public facility 83% Males and 17% Females	Cross sectional analytical study	278	Sample group consisted of patients with oral lesions only (Not Applicable).	OC-40%, OHL-26%	ASIA Thailand
3 Ranganathan et al 2000	HIV positive patients between 7 months and 72 years who attended a public facility 68% Males and 32% Females	Cross sectional analytical study	300	72%	OC-56%, AC-8%, OHL-3%	ASIA South India
4 Anil and Challacombe 1997	HIV positive patients over 18 years old	Cross sectional analytical study	96	Sample group consisted of patients with oral lesions only (Not applicable)	OC-81%, AC-13%, OHL-7%, NUP-23%	ASIA India
5 Mace et al 2000	HIV positive patients over 18 years old 78% females and 22% males	Cross sectional study	192	Not Applicable	OC-12%, OHL-6%	AFRICA Tanzania
6 Arendorf et al 1998	HIV positive adults	Cross sectional study	600	60%	OC-38%, AC-7%, OHL-20%, NUP-3%, NUG-1%, KS-2%	AFRICA South Africa
7 Arendorf et al 1997	HIV positive adults 225 Blacks, 191 Coloureds and 69 Whites	comparative inter-group cross sectional study	485	56%	OC-35%, AC-6%, OHL-19%, NUG-2%, NUP-4%	AFRICA, South Africa
8 Mugarika et al 1991	HIV positive adults	Cross sectional study	103	Not Applicable	OC-62%, AC-3%, NUG-16%, KS-5%	AFRICA, Zaire

9	Ramirez-Amador et al 1998	HIV positive adults 60% Females and 40% Males all study sample were Mexican	Cross sectional analysis study	436	71%	OC-39%, AC-11%, OHL-30%, NUP-2%, NUG-3%, KS-2%	SOUTH AMERICA Mexico
10	Schuman et al 1998	HIV positive woman over 18 years who attended a multi centre health facility 100% Females	Longitudinal cohort study	867	40%	OC-15.3%, AC-4.2%, OHL-6.8%	USA Detroit Providence
11	Klein et al 1991	HIV positive patients over 18 years 43% Females and 57% Males	Cross sectional study	181	92%	OC-92%, OHL-19% KS-4%	USA New York
12	Silverman et al 1986	HIV positive patients over 18 years 100% white homosexual males	Longitudinal cohort study	164 (all males)	Not applicable	OC-87%, OHL-21%, NUP-19%, KS-32%	USA San Francisco
13	Margiotta et al 1999	HIV positive patients over 18 years Both males and females, all subjects were Italian	Cross sectional study	104	36%	OC-6%, OHL-10% NUP/NUG-3%	EUROPE Italy

**KEY:** OC = oral candidiasis; AC=angular cheilitis; NUG =necrotising ulcerative gingivitis; NUP =necrotising ulcerative periodontitis; OHL = oral hairy leukoplakia; KS=Kaposi's sarcoma

SOURCE: Bhayat (2007)

Caution should be exercised in populations that display a low prevalence of HIV since the use of clinical diagnosis of oral mucosal lesions is a poor predictor of HIV infection (Robinson et al., 1998). Naidoo and Chikte (1999) suggested that in order to increase the Positive Predictor Value (PPV) of HIV, the presence of oral mucosal lesions must be combined with a social history to identify risk factors for HIV infection. Oral examination is “quick and inexpensive and may have a place in screening populations at greater risk of HIV, particularly those attending genito-urinary medicine clinics,” (Naidoo and Chitke, 1999) and there is no reason as to why this value cannot be extended to patients attending general and dental clinics. However, in order to do so health care professionals would need to be trained to identify the lesions that they find when screening patients (Naidoo and Chikte, 1999). Agbelusi and Wright (2005) reported that in a study they conducted in Nigeria at the Oral Diagnosis/Oral Medicine Clinic of the Lagos University Teaching Hospital, 53 out of 700 patients that were screened had oral mucousal lesions. Of these 72% consented to, and underwent HIV-screening, with thirty-five (92%) being confirmed positive for the HIV virus.



### **Oral Conditions as Markers of HIV/AIDS Disease Progression**

HIV- related oral manifestations are often a frequent and early warning sign of HIV infection and serve as useful markers of disease progression and immunosuppression (Ranganathan and Hemalatha, 2006). Most HIV-infected patients have head and neck manifestations at some stage of the course of the disease, with fungal and viral infections as well as malignant neoplasms forming the bulk of such lesions (Greenspan and Greenspan, 2002; Arendorf et al., 1998; Sculy et al., 1991), indicate that the presence of oral hairy leukoplakia and oral candidiasis are parallel to the decline in CD4 cell count, and increase in viral load indicates progression to AIDS.

## **Voluntary Counselling and Testing (VCT)**

Vermund and Wilson (2002) noted that providing greater opportunities for testing is one of the essential pre-requisites for the reversal of the HIV/AIDS epidemic. The impact of VCT cannot be overstated in a developing country such as South Africa. To gain maximum benefit from therapies and in order to prevent on-going transmission, HIV-infected individuals need to have their infection diagnosed promptly. VCT has been described as a cornerstone of early access to prevention of HIV infection, as well as to care and support services (Irungu et al., 2008). HIV VCT services are a key component of national AIDS prevention programmes in Sub-Saharan Africa (Wringe et al., 2008). Many countries such as Kenya (Irungu et al., 2008), and South Africa utilises a four-pronged approach (abstinence, be faithful, condom-use, [ABC] and VCT)) to combat the HIV/AIDS epidemic. Studies in both developed and developing countries have found that VCT for HIV/AIDS can be an effective intervention in the fight against HIV/AIDS (Hutchinson and Mahlalela, 2006; Day et al., 2003) and is an important and formidable element of an effective HIV prevention and care programme in many African countries. VCT has become a part of the primary health care package offered by many African countries (Pronyk et al., 2002; Maman et al., 2001; Coovadia, 2000).

The efficacy of VCT as a preventive strategy is supported by research and demand for VCT is growing rapidly (Pool et al., 2001). The erroneous perception that sometimes exists is that VCT is for diagnostic purposes only are slowly changing as more information is made available (Van Dyk and Van Dyk, 2003). VCT can serve as an ideal entry point into the health system, thus allowing patients access to appropriate resources for the management of HIV/AIDS, and its opportunistic infections (UNAIDS, 2009). VCT can also serve as an important conduit for the dissemination of health information and promotion, thus encouraging behavioural changes in infected and non-infected individuals (Ginwala et al., 2002).

The expansion of VCT is a focal point for the Zuma government's National Strategic Plan for HIV/AIDS. On 08 April 2010 President Jacob Zuma launched a massive VCT campaign (the most comprehensive and rapid campaign in the world and aims at testing 15 million persons by June 2011. The availability of testing facilities, rapid testing capacities and programmes that support VCT (community mobilisation, VCT campaigns etc.) have proven effects on testing uptake rates, in urban and rural areas (Pronyk et al., 2002; Day et al., 2003).

HIV/AIDS also places a huge burden on the financial resources of a country and on the economy, and in efforts to reduce/counter the burden of disease, many mining companies have routinely made VCT available, some as early as 1991 (Day et al., 2003). Efforts need to be made to encourage the involvement of VCT for both partners (Pool *et al* 2001) as this will lead to a more focussed sensitisation of men (Urassa et al., 2004). VCT for couples has been described as a “high-leverage intervention” for HIV/AIDS prevalence in Sub-Saharan Africa because of its demonstrated effectiveness (Irungu et al., 2008).

VCT has been shown to be “efficacious and cost-effective” in developing countries such as Kenya and Tanzania (Irungu et al., 2008). VCT thus has feasible and beneficial effects and important public-health implications in averting HIV infections (Sweat et al., 2000). Cost-effective analysis studies have shown that the benefits of VCT, especially in high-risk populations, are cost-effective in reducing risk/transmission of HIV/AIDS (Sweat et al., 2000). Van de Perre (2000), reported that early HIV infection diagnosis results in US\$12.77 and UD\$17.78 per disability-adjusted life-year (DALY) saved in Kenya and Tanzania respectively. This illustrated major cost-savings and effectiveness of VCT, especially when compared to the cost of other interventions (management of STI's, cost of ART, etc.). Van de Perre (2000), also reported a measurable decline in STI's and changes in behavioural patterns of individuals who underwent VCT in Kenya, Tanzania and Trinidad, thus reinforcing the benefits of VCT. The cost per disability adjusted-life year saved is similar to the benefits gained from immunizations and improved management of STI's (Sweat et al., 2000). Clearly then the early diagnosis of HIV, based on the primary health care nurse being able to identify the HIV pre-indicative oral manifestations and then actively referring these patients for VCT, has numerous public-health benefits.

## **Traditional Healers**

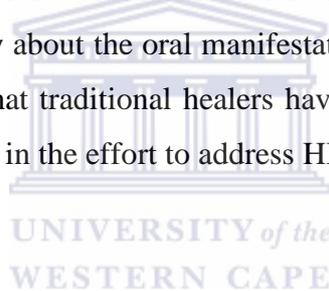
There has been greater legitimization of complementary and alternative forms of healing, including African traditional healing (Rudolph, 1996). Traditional healers are “deeply interwoven into the fabric of cultural and spiritual life of a large proportion of South Africans and they are easily accessible in urban, peri-urban and remote areas where other health services are lacking” (Mills et al., 2006). They are recognized by the communities in which they live and practice as competent health care practitioners (Puranwasi, 2006). Worldwide there is increasing interest in traditional healing as a resource for health care delivery (Nevin, 2000). Many patients are now seeking medical help from traditional healers concurrently with the help that they receive from formal health services.

In many communities within South Africa, traditional healers are often the only means of health care available, often with no alternative (Rudolph, 1996). Abdool-Karim (1998) reported that South Africa had 25 000 orthodox doctors and about 200 000 traditional healers in 2006, and that 80% of South Africans utilize the services of traditional healers especially so in rural areas that are grossly underserved. Puckree et al., (2002), found that 70% of patients in Durban, KwaZulu-Natal who consulted an African traditional healer (iSangoma) did so as their first choice. Studies conducted in Tanzania indicate that approximately 80% of HIV infected patients receive their medical attention from traditional healers rather than from a hospital/primary health care facility (Rudolph, 1996). It is thus vitally important, “if we ever hope to defeat the HIV/AIDS pandemic, that traditional healers” and western/allopathic (orthodox) medical practitioners work closely together (Courtright et al., 2000).

Traditional healers thus constitute an untapped resource with enormous potential to help address the HIV/AIDS pandemic. Chipfakacha (1997) argued that cooperation between traditional healers and scientific medical personnel is essential for an effective and successful HIV/AIDS prevention programme. Pretorius (1999) argued that the interface of traditional and modern health care systems could easily be done at both a primary health care level and at the district health care level. This is particularly cognisant with increasing recognition

being given to the role of traditional healers in the prevention and control of HIV/AIDS. A number of programmes have targeted traditional healers, in educating them to improve their skills in the diagnosis, counselling and treatment of clients infected with HIV/AIDS and STI's (Green, 2000).

Lewis et al., (2004) found that in two areas in Gauteng (Zonkiziziwe and Dube) 50% of patients who visited traditional healers presented with oral manifestations. Oral lesions are present in 40-70% of patients and some of these lesions are used as important markers of disease stage and state (Puranwasi, 2006). Lewis also reports from this study that of the 49 traditional healers who participated in the study, forty-six (93%) had no formal training in oral conditions, 43 (87%) were not familiar with oral cancer and over 40% were unable to identify oral lesions associated with HIV/AIDS, such as oral hairy leukoplakia, moluscum contagiosum and herpes. Therefore traditional healers need to have correct information about oral diseases and especially about the oral manifestations of HIV/AIDS (Green, 2000). Lewis et al., (2004) concluded that traditional healers have an important role to play in the early detection of oral HIV/AIDS in the effort to address HIV/AIDS in South Africa.



## **Stigma**

Stigma has been identified as a major barrier to health care and quality of life in illness management (Deacon, 2006). Stigma refers to “any negative meanings or set of values associated with someone having or being perceived as having, HIV/AIDS” (Maughan-Brown, 2006). Stigmatisation is viewed as a dynamic social process involving:

- I. the identification, albeit accurate or inaccurate, of someone who has HIV/AIDS:*
- II. the assignment of negative values to that person and the concurrent devaluation or loss of reputation of that person: and then potentially,*
- III. discriminatory behaviour, including inaction, towards the person in question.*

(Maughan-Brown, 2006)

Mills (2004) has shown that stigma prevents people in South Africa from accessing health care. Nkhoeli (2005), reported from a study of 105 HIV infected persons in Soweto, only 62% reported disclosing their status to their current partner. HIV infected patients with oral diseases may experience discomfort and stigma which increases with profound effects on social behaviour, argued Johnson et al., (2006). Loss of weight, loss of appetite, distortion of taste, burning mouth and xerostomia all have a negative effect on the patient as a whole and that initiatives need to be put in place in order to minimize this stigma in the provision of non-discriminatory access to oral health and general health care (Johnson et al., 2006).

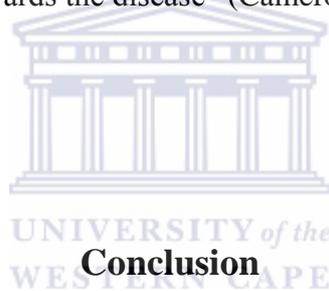
Hodgson et al., (2006) indicated that in a study done in the USA 17% (n=2003) of dentists were unwilling to treat HIV infected patients, whilst in England only 55% of dentists surveyed were willing to treat HIV infected patients. In South Africa only 42% of dentists would willingly treat a HIV infected patient (Naidoo, 1997). Balasundarum (2004) found that the situation in Chennai, India was worse, with 78% of dentists not willing to treat HIV infected patients. This unwillingness to treat HIV/AIDS patients may actually start during the undergraduate training of oral health care workers. Erasmus et al., (2005) indicated that 86% of dentistry and oral hygiene students, who participated in a research project at the Faculty of Dentistry, University of the Western Cape, indicated that special precautionary measures should be taken when treating HIV/AIDS patients. Interestingly 67% of the students reported that the curriculum prepared them adequately to treat HIV/AIDS patients, but only 53% felt that they could manage HIV/AIDS patients. A shocking 87% of students did not know what to do should they suffer a needle-stick injury. These factors play a role in the willingness/unwillingness of oral health care workers to treat HIV/AIDS patients. The study also indicated a lack of consistency in the use of universal precautions. Also revealed was that not all students were able to identify the oral manifestations that present early in HIV infection, such as Herpes and Periodontal disease. Thus there is always the need for clinicians to treat every patient as being potentially infected.

Van Dyk and Van Dyk (2003) proposed that in order for a Voluntary Counselling and Testing (VCT) campaign to be successful there exists “a need to combat the negative attitudes, myths and misconceptions about HIV/AIDS that are pervasive in some segments of society can impede efforts to promote VCT and other HIV prevention efforts”. A large

number of people still deny the existence of HIV/AIDS (Marais, 2000) and this denial takes place in three categories, viz:-

- Denial of the existence of HIV/AIDS
- Denial of its seriousness and relevance
- The fatalistic view that HIV/AIDS cannot be avoided.

The previous South African government, led by the former President Thabo Mbeki, is notoriously known for its denial of the existence of HIV/AIDS. Campbell et al., (2005) suggested that one of the reasons for Mbeki's denial of the existence of HIV/AIDS is that the pandemic threatened his vision of an "African Renaissance" and that it would blur his vision of a "bright post-apartheid future" compared to a "wretched past". It was only on April 17, 2002 that the Mbeki presidency announced that that it was "jettisoning its AIDS denialism and adopting a caring attitude towards the disease" (Cameron, 2002).



*"AIDS is no longer a disease, it is a human rights issue."*

Nelson Mandela at the 46664 concert, Green Point Stadium, Cape Town, 29 November 2003.

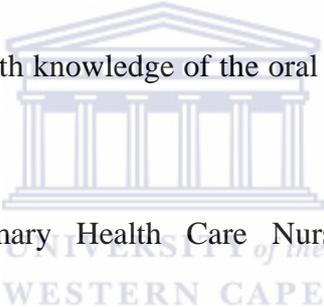
HIV/AIDS is a major threat to all the people of the world, and more especially the people of sub-Saharan Africa. The epidemic will, at some stage affect or infect every single South African. Therefore all sectors of society must pool their resources (physical, financial, intellectual, human capital, time etc.) to combat HIV/AIDS. Sectors of society that are unwilling to commit resources should be punished in some way, either by sanction or by law. A prime candidate for some type of censure for its refusal to play a role in combating HIV/AIDS is FIFA, who refused to allow HIV/AIDS promotion messages to be broadcast during the 2010 World Cup. The focus needs to continue to remain on the youth, on addressing gender imbalances and on impact mitigation (Whiteside, 2008).

## CHAPTER 3 : AIMS AND OBJECTIVES

### Aim

To determine the oral health knowledge, practices and treatment patterns of the oral manifestations of HIV of Primary Health Care Nurses in the uMgungundlovu District.

### Objectives

- 
- To determine the oral health knowledge of the oral manifestations of HIV of Primary Health Care Nurses.
  - To determine how Primary Health Care Nurses manage patients with oral manifestation of HIV
  - To determine the referral patterns of PHC nurses for patients presenting with oral manifestations of HIV.
  - To determine the effect of education and whether awareness, attitudes and practices of PHC nurses differed following an education intervention.
  - To provide guidelines for oral health education to be included in the curriculum of PHC nurses.

## **CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY**

### **Introduction**

In this chapter the design and format of the research process is outlined together with the sampling, details of data collection, data capture and processing.

### **Study design**

A cross-sectional survey, conducted between July and October 2010.

### **Study sites**

The study sites included primary health care facilities, as well as both public and private hospitals and educational facilities. An attempt was made to access all the facilities in the uMgungundlovu district, with the exception of some of the smaller clinics that were only opened periodically (e.g. one day a week). The institutions represented a range of Health Care and Nursing Health Education delivery units within the uMgungundlovu District - both Local Government (Municipal) and Provincial Government institutions were utilized as research sites.

All Provincial Nursing Colleges in the District, as well as the two largest Private Sector Nursing Colleges and two (2) tertiary institution student clinics were also included as research sites.

The study sites included the following institutions:-

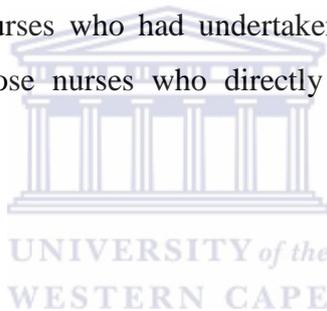
Edendale Hospital, Greys Hospital, Northdale Hospital, Bruntville Community Health Centre, Imbalenhle Community Health Centre, Richmond Community Health Centre, East Street Clinic, Howick Clinic, Gateway Clinic, Eastwood Clinic, Oribi Clinic, Mpophomeni Clinic, Edendale Nursing College, Greys Nursing College, Michaelmas Nursing College, Durban University of Technology Nursing College and clinics, RVM Singh Nursing College.

## **Study population and study sample**

The study population consisted of PHC Nurses and PHC Nursing educators in the uMgungundlovu District, KwaZulu-Natal. A total number of 267 nurses, being the total number of nurses available, were approached via the district manager and their respective line managers. Meetings were arranged with all the nurses at some institutions whilst the researcher had to meet with individual nurses in some institutions. A simple random convenience sample (grab sampling), based on the principle of cluster sampling, of 150 PHC Nurses ( $\pm 55\%$  of the target population) was utilised. This was based on 5% error tolerance allowance with a 90% confidence level of the target population.

### *Inclusion and Exclusion Criteria*

The study was not limited to nurses who had undertaken specialised primary health care nursing, but limited only to those nurses who directly assessed, diagnosed and treated patients.



## **Instrument**

A structured questionnaire was used to collect the data (Appendix I). The questionnaire was designed to ensure that it suited the aims and objectives of the study, was clear, simple and unambiguous, minimized potential errors from the researcher and coder and enabled efficient, meaningful analysis of the acquired data.

The questionnaire was used to determine the:-

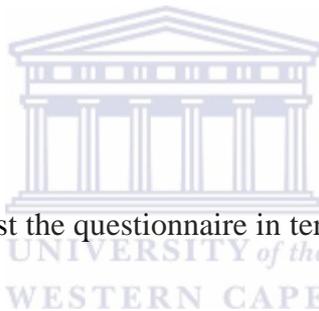
- Age and gender of the nurses.
- The experience, training and qualifications of the nurses.
- The treatment and referral patterns of the nurses with reference to oral assessment and oral HIV identification.
- The oral healthcare professional support structure available to these nurses.
- The perceived need for further training in oral assessment and oral HIV lesion identification.

## **Development of the questionnaire**

Planning of the questionnaire began in February 2010. It was developed from information obtained from the review of literature on the oral manifestations of HIV, as well as nurses education, treatment and referral patterns. The data gathered was divided into five sections:

- (i) demographic – age and gender of the patient;
- (ii) qualifications and experience;
- (iii) training;
- (iv) assessment and referral patterns;
- (v) oral health education practices and knowledge.

## **Piloting the questionnaire**



A pilot study was conducted to test the questionnaire in terms of practicability and relevance. The pilot study was carried out to:

- (i) test the suitability of the method of collecting the data;
- (ii) test how long the pre- and post-tests would take to complete;
- (iii) check the adequacy of the questionnaire;
- (iv) check that all the parameter measurements were clear and unambiguous;
- (v) ensure that no major item had been omitted; and
- (vi) remove any items that did not yield usable data.

## **Preparation of the final draft**

After the pilot study in which 10 nurses from the eThekweni District were approached and asked to assist with an evaluation of the questionnaire and pre- and post-test process. They participated in the study and identified that some questions were difficult to understand in terms of the syntax and sentence structure (which could have led to possible measurement errors). Concerns were also raised about the clarity of the photographs in the test. The irrelevant and problematic items were identified and deleted or reformulated with questions being rephrased and the photographs were printed on a high resolution colour laser printer by a commercial printing company, which increased their clarity. The tests and questionnaire was in English and no concerns were raised as to any English language issues. The questionnaire included questions on the demography of the sample – age, gender, occupation, primary qualification, post-graduate qualification, any training in HIV/AIDS etc. The final questionnaire consisted of 42 structured questions and the main response formats were dichotomous scales, categorical questions and semantic differential scales. For the scales the nurses were asked to indicate their level of agreement (yes/no) to a statement, or possible responses in relation to education, nursing practices etc. The semantic subscales were used to measure self-rated knowledge of oral care, HIV pre-indicative lesions, referral patterns responses etc. A final draft of the questionnaire was then printed and used for the study.

A structured questionnaire including questions on the demography of the sample – age, gender, occupation, primary qualification, post-graduate qualification, any training in HIV/AIDS etc. was then completed. Other information that was collected included knowledge and awareness of oral HIV pre-indicative conditions and oral manifestations associated with HIV/AIDS (Appendix II).

## Data Collection Methods

The study was in two parts: A Pre-Test and a Post-Test assessment (Appendix II), together with the provision of education and educational material and an administered questionnaire as follows:

*Pre-Test:* Subjects were shown a series of ten sets of photographs of the oral manifestations and were asked to identify the conditions that they were representative of. The test was administered by the researcher or a facilitator and the subjects placed the answer sheet into an envelope and sealed it. The envelope was then collected and only opened at the end of the study, in order to avoid institution bias. The questionnaires could not be linked to the test results or the institution because in some institutions there was only one respondent, and such linking would have compromised the confidentiality of the study.

*Questionnaire:* This was handed to the participants and collected between 3-5 days later. An oral care self-administered questionnaire was developed to collect information on knowledge and education about oral care and oral health assessment, management of oral care and oral health promotion, influences on knowledge of oral conditions and assessment, knowledge of pre-indicative and common oral HIV manifestations, VCT referral patterns and demographics.

*Education and training:* The nurses were provided with educational material, including a handbook titled “Common oral lesions in Children and Adults with HIV/AIDS – Visual reference for health care workers” which was produced by Professor S. Naidoo, Department of Community Dentistry, University of the Western Cape.

*Post-Test:* The subjects were subjected to a post-test 3-5 days later, by being shown the same series of ten sets of photographs of the oral manifestations and asked to identify the conditions that they were representative of. The test was administered by the researcher or a facilitator and the subjects placed the answer sheet into an envelope and sealed it. The envelope was then collected, and only opened at the end of the study, in order to avoid institution bias.

## **Bias**

Due to the fact that only nurses from the public sector and education facilities participated in study there may be a bias in that it does not represent the general population of primary health care nursing practitioners who may practice at private hospitals and other facilities such as doctors' rooms, chain store pharmacies that have nursing services (e.g. Clicks stores) etc. This is a form of selection bias as the results obtained may be unrepresentative of the study population.

## **Validity and Reliability**

The questionnaire was tested for content validity by submitting it to and it was modified according to their feedback. In order to ensure reliability the study all the research was conducted by the researcher personally by a facilitator. Golafshani (2003) cites authors such as Joppe (2000) who acknowledges that there may be problems with the test-retest method as the respondent may become sensitised to the subject matter and therefore their responses may be, to a certain degree, unreliable. The score obtained may also lead to errors of measurement. Joppe (2000) also defined validity as determining whether the research “truly measured that which was intended to measure and how truthful the results are.” In this study a triangulation method was used wherein a seasoned researcher as well as my supervisor were involved in questionnaire construction and review, and a seasoned statistician was involved in data analysis and interpretation. In order to ensure that Test-Reliability reliability was maintained the same test was given to different groups of subjects, with similar results being obtained, thus indicating a high positive correlation. The memory effect that could have affected the results was countered by ensuring that the retest was administered three to five days after the initial test, although an artificially high reliability coefficient could have been created as some PHC nurses may have responded to the retest out of memory from the first test. In order to eliminate experimenter bias the both the pre-test and post-tests were only scored once all the subjects had completed all aspects of the study.

In order to ensure validity the study had to ensure that there exists a causal relationship between the independent and dependent variables. In order to ensure validity the same test instruments were used for the pre-test and the post-test, so as to ensure that internal validity is maintained.

## **Data analysis**

At the end of the study the data was collated, cleaned, and entered into a Microsoft Excel® spread sheet. Descriptive statistics were calculated and parametric statistics were used to analyse the data. Further processing of data to produce tables and graphs was carried out using Microsoft Excel®. The statistical analysis tool that was used was frequency distribution and tables. The analysis of the pre-test and post-test results were analyzed using a linear model that includes the effect of lesion type, pre-test and post-test defining the period the evaluations were made, and an interaction between them. Specific contrasts (differences) of interest between the two periods (pre vs. post) within each lesion type were made from the interaction itself. The model accommodated for the *binary nature* of the response (success, failure to detect) and as such it is a *generalized* linear model. All the analyses were performed using the powerful statistical software SAS® (2004) (Version 9.1.1 Cary, NC SAS Institute Inc.). A *p-value* of <0.05 was regarded as being statistically significant. A simple coefficient correlation (Pearsons Correlation Coefficient) was carried out using the “Z” test to provide a correlation analysis of selected variables such as experience vs. knowledge etc.

## **Establishing contacts**

The researcher visited the various sites, after obtaining the permission of the facility heads, at pre-arranged times. Some institutions allowed the researcher to meet the nursing staff en-masse, and addressed the nurses explaining the purpose of the study and the methodology. Other institutions requested the researcher to meet with the nurses on an individual basis during their lunch-breaks and this necessitated the researcher visiting the same facility on numerous occasions. Other institutions provided the researcher with a facilitator who assisted in the administration of the test, collection of questionnaires.

## **Ethical approval**

The Senate Research Ethics Committee of the University of the Western Cape (Approval No. 10/4/5) gave ethical approval for the study to be conducted (Appendix V). The Health Research and Knowledge subcomponent of the KwaZulu-Natal Department of Health granted approval for the study (Appendix VI), dependant on support from the institutions. Institutional support was obtained from the Head of the Nursing College (Appendix VII) and the District Manager – uMgungundlovu (Appendix VII). Approval was also obtained from the Medical Officer of Health from the uMgungundlovu District Municipality (Appendix IX).

## **Conclusion**

This chapter described the selection of the study population. Establishing contacts and accessing information was not an easy task – as many of the superintendents and head of clinics were very uncooperative and took an inordinate amount of time to grant permission. The instrument developed to collect the data was a focused, structured data capture sheet in six parts and the piloting of it is described in this chapter.

## **CHAPTER 5: RESULTS**

An analysis of the questionnaires and the pre- and post-education tests forms the basis of the results reflected in this chapter. The tests involved the identification of ten (10) sets of photographs depicting a range of oral conditions, lesions and diseases that were reflective of both general and HIV pre-indicative oral manifestations. An analysis of the questionnaires provided a range of information pertaining to the nurse's experience, knowledge, attitudes and beliefs.

### **Response rate**

Two hundred and sixty-seven nurses, being all the nurses at these institutions were approached to participate, and were thus the target population. One hundred and seventy two nurses agreed to participate (64,4% participation rate), but only one hundred and twenty-one (n=121, 70% of participants) completed the tests and questionnaires. The overall response rate therefore was 45% (121/267) of the total target population in the district.



### **Demography of the sample**

One hundred and twenty-one (n=121) nurses took part in the study. The majority was female. (Table 3).

**Table 3: Demography of sample by gender**

<b>Gender</b>	<b>Number (n=121)</b>	<b>Percent (%)</b>
<b>Male</b>	<b>14</b>	<b>11,6</b>
<b>Female</b>	<b>107</b>	<b>88,4</b>

**There were significantly more females than males (p< 0.05, CL 95%).**

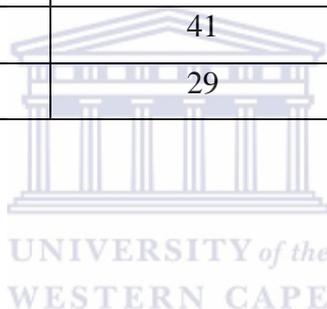
## Age distribution

The age ranged from 18 years to 50+ years (Table 4). The combined mean age was 41,43 years with a standard deviation of  $\pm 9,83$  years. The majority of the nurses were between 30 and 50 years of age (62%).

**Table 4: Age distribution of nurses**

Age Group (years)	Number of nurses (n=121)	Percent (%)
18-24	4	3,3
25-29	13	10,7
30-39	34	28,1
40-49	41	33,9
50+	29	24,0

## Period of Qualification



**Table 5: Years of experience as a nurse**

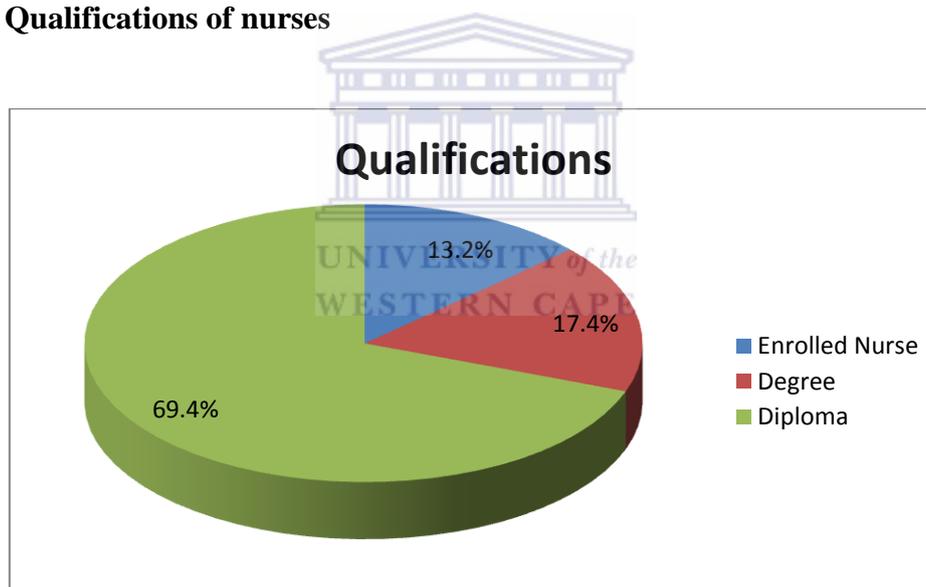
Year of qualification	Under-grad. Qualification	Percentage	Post-graduate Qualification	Percentage
1975-1979	09	7,4%	02	5,8%
1980-1984	08	6,6%	0	0%
1985-1989	26	22,55	0	0%
1990-1994	11	9,6%	07	20,6%
1995-1999	19	15,7%	09	26,7%
2000-2004	29	24,9%	05	14,7%
2005-2009	16	13,3%	11	32,2%
<b>Total</b>	<i>n</i> =121	100%	<i>n</i> = 34	100%
<b>Mean</b>	14,75 years ago	<b>SD</b> $\pm 5,47$	6,98 years ago	<b>SD</b> $\pm 5,47$
<b>Mode</b>	12,5 years ago		12,5 years ago	

Forty-five nurses qualified between 1990 and 1999, and the remainder (n=37) graduated post-2000, during the peak of the epidemic.

The undergraduate qualifications of these nurses are reflected in Figure 1. Only 34 (28,1%) had a post-graduate specialist primary health qualification, with the rest (87, 71,9%) possessing only an undergraduate qualification.

Of the 34 nurses with post-graduate primary health care qualification all had completed a one-year post graduate qualification. The qualification mix of the study sample encompassed three nursing qualification levels: the 2-year Enrolled Nurse (EN), the 3/4 year Diploma/Degree in Nursing (Registered/Professional Nurse). A breakdown of the qualification mix of the study sample is reflected in Figure 1.

**Figure 1: Qualifications of nurses**



## Experience

The sample studied had a range of years of experience (Table 3). The mode of the nurses experience is 15,5 years and the mean is 22,75 SD±6,32. However 24 (20%) of these nurses had their nursing service interrupted, and 97 (80%) had unbroken service for an average of three years.

While more than ninety percent (92,5%) of the nurses were continuously active in the field of primary health care, nine (7,5%) had their service interrupted for an average of 4,66 years.

**Table 6: Years of experience as a nurse**

<b>Years</b>	<b>Number (n=121)</b>	<b>Percent (%)</b>
<b>0-2</b>	7	5,8%
<b>3-5</b>	12	9,9%
<b>6-10</b>	23	19,0%
<b>11-20</b>	30	24,8%
<b>20+</b>	49	40,5%

A number of respondents were involved in other areas of nursing prior to being involved in the field of primary health care nursing. The mode for the period of experience in the field of primary health care nursing is 7,48 years with  $SD \pm 5,48$  years. The years of experience in the field of primary health care nursing for the study sample is reflected in Table 6.

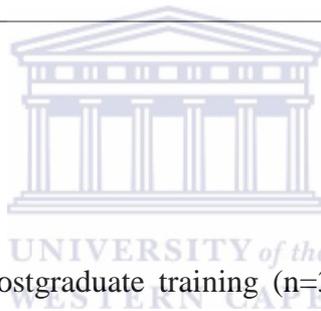
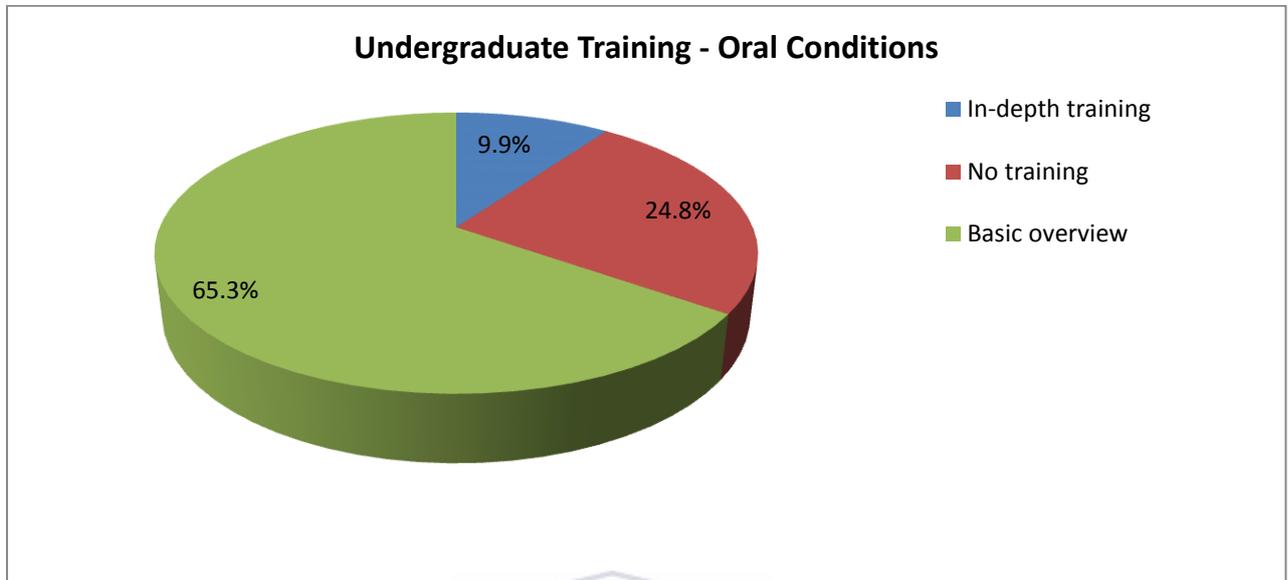
**Table 7: Years of experience as a nurse in the field of primary health care**

<b>Years</b>	<b>Number (n=121)</b>	<b>Percent (%)</b>
<b>0-2</b>	23	19,0
<b>3-5</b>	28	23,1
<b>6-10</b>	36	29,8
<b>11-20</b>	28	23,1
<b>20+</b>	6	6,0

### **Undergraduate and Post-graduate training in oral conditions management**

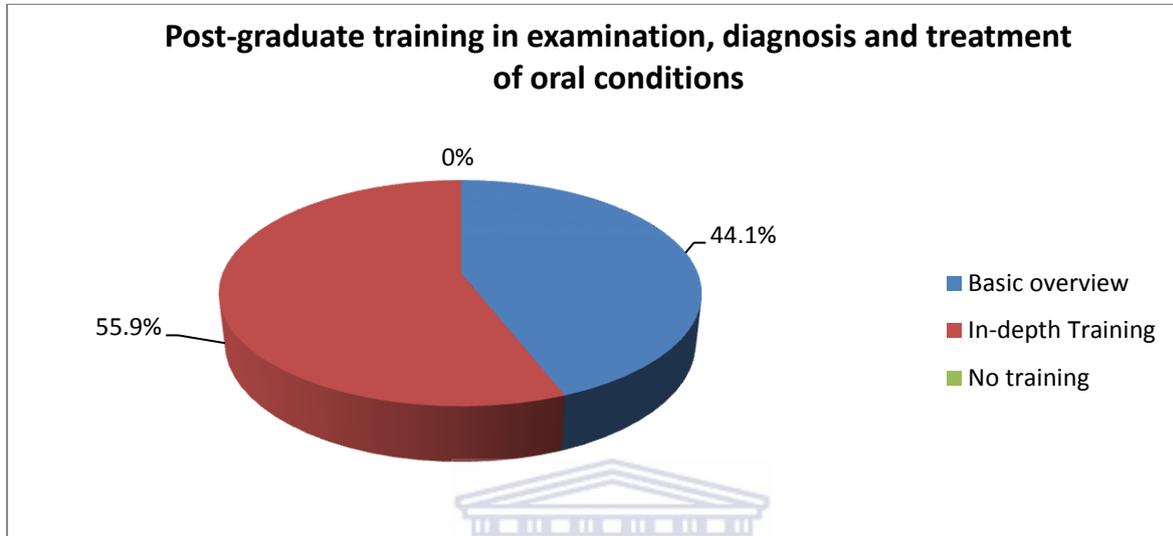
The nurses who participated in the study (n=121) reported differing exposure to training in the examination, diagnosis and treatment of oral conditions during their undergraduate training, which is reflected in Figure 2.

**Figure 2: Exposure to training in the examination, diagnosis and treatment of oral conditions during undergraduate training**



Of those nurses who received postgraduate training (n=34), there were differences in the training with regards to training in the examination, diagnosis and treatment of oral conditions, and this is depicted in Figure 3. Whilst only 65,3% of the nurses received basic training in the examination, diagnosis and treatment of oral conditions while only 9,9% of PHC nurses received in-depth training. Almost a quarter (24,8%) of PHC nurses received no training at all. This could have possible negative consequences in the diagnosis and treatment of patients presenting to PHC clinics in the district and represents a failed opportunity in the early identification of HIV-positive persons.

**Figure 3: Exposure to training in the examination, diagnosis and treatment of oral conditions during post-graduate training**



Of the 55,9% of nurses with in-depth training at a post-graduate level in examination, diagnosis and treatment of oral conditions only 73% always referred patient who presented with oral lesions indicative of HIV for VCT.

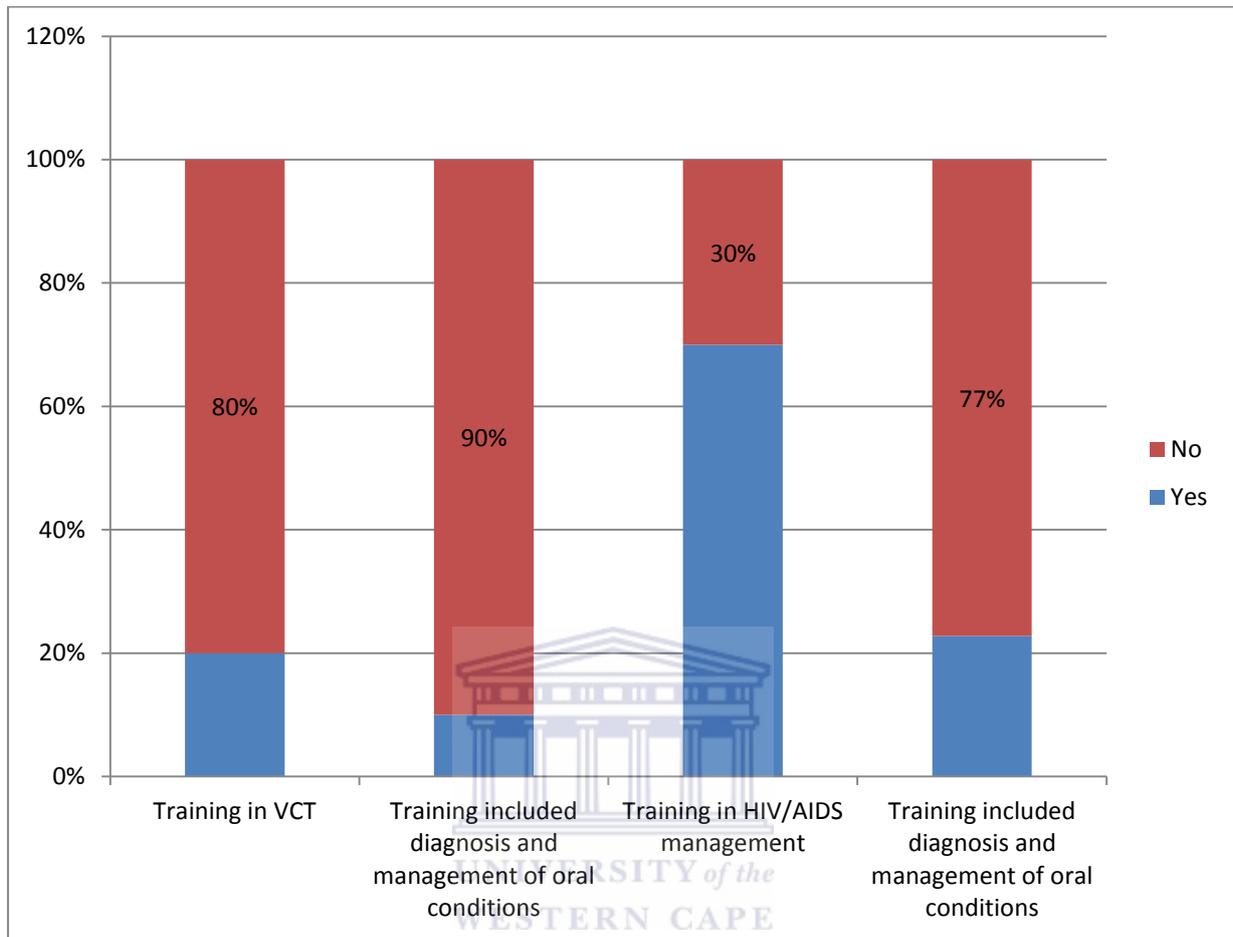
### **Training in VCT and Oral conditions, HIV/AIDS management and oral conditions**

The total study sample was asked if they had received training in:-

- (i) voluntary counseling and testing (VCT), and did this training include the treatment of oral problems,
- (ii) the management of patients with HIV/AIDS, and if this training included the management of oral conditions.

These results are depicted in Figure 4.

**Figure 4: Training in VCT and Oral conditions, HIV/AIDS management and oral conditions.**

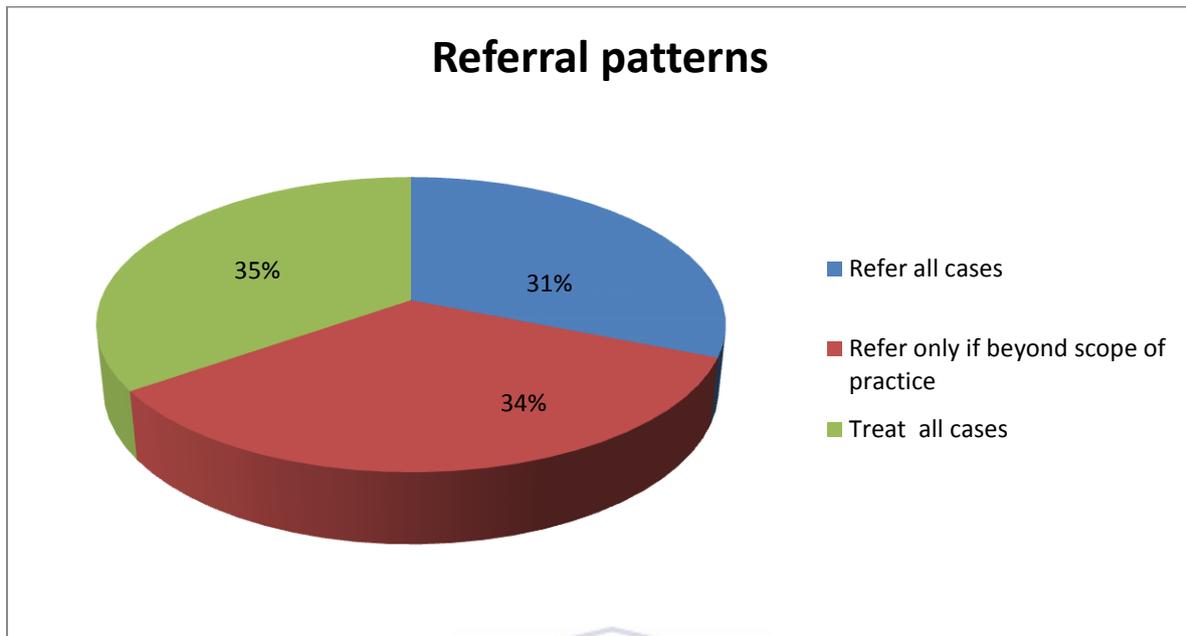


### **Nurses examination practices and referral patterns**

Nurses were asked if they examined patients mouths. A total of thirty-nine (32,2%) indicated that they always examined the patients mouth, sixty-five (53,7%) occasionally examined the mouth while seventeen (14,1%) acknowledged that they never did. Of the respondents who either always or occasionally examined patients mouths only 59 of the 104 nurses (57%) were comfortable with examining the mouth, and seventy-five (72%) indicated that they would benefit from additional training in the assessment of the oral cavity.

Treatment and referral patterns of the nurses who either always or occasionally examined patient’s mouths (n=104) are depicted in Figure 5. This could have possible negative consequences in the diagnosis and treatment of patients presenting to PHC clinics in the district and represents a failed opportunity in the early identification of HIV-positive persons.

**Figure 5: Referral patterns of nurses who examine patients mouths (n=104)**



Of those nurses (n=104) who indicated that they examined patients mouths either always or occasionally, seventy-eight (75%) indicated that they were aware that certain oral conditions were prognostic of HIV/AIDS. Similar results were obtained for nurses responses to knowledge and awareness that certain oral conditions are common oral manifestations of HIV/AIDS. When asked whether these nurses (n=104) refer patients, who presented with a HIV/AIDS pre-indicative oral lesion for VCT just over half (53%) said they do refer.

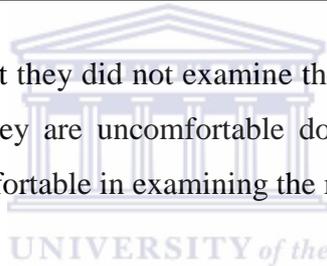
A total of 14% (n=17) of the 121 PHC nurses stated that they never examine patients mouths, whilst only 53,7% did so occasionally (n=65). Thirty-nine (32,2%) of the nurses did not examine the mouth at all. The reasons for this are reflected in Table 5.

**Table 8: Reasons for nurses not examining the mouth at every patient assessment.**

Of the study sample (n=121) 82 nurses either examined the mouth occasionally or not at all. The reasons for doing so are tabulated below:-

<b>Reason</b>	<b>Number of Nurses</b>	<b>Percentage</b>
Not trained in assessment of oral cavity	17	20,7%
Not the task of the nurse, but of the Dental Practitioner	18	21,9%
Only presenting signs and symptoms are assessed and treated	43	52,4%
Exam of mouth is not part of the routine screening process	4	5%
Other reasons	0	0
<b>TOTAL</b>	<b>82</b>	<b>100%</b>

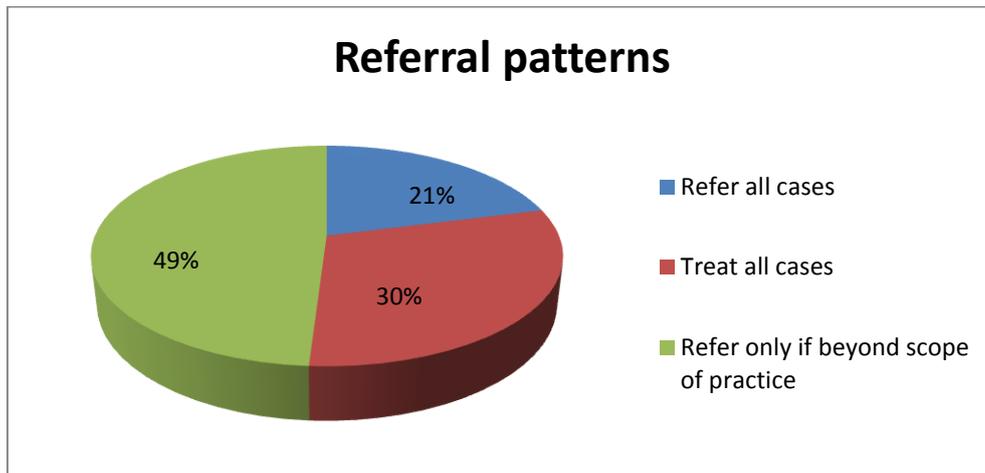
Seventeen of nurses indicated that they did not examine the mouth at all, with two (7,7%) of them offering the reason that they are uncomfortable doing so and the remaining fifteen (92,3%) stating that they are comfortable in examining the mouth but do not do so.



Of the 17 nurses who do not assess the mouth at all, thirteen (84,6%) felt that they would benefit from additional training, while the remaining four (15,4%) felt that additional training in assessment of the oral cavity would not be beneficial to them.

Of those nurses (n=17) who did not ever examine patients mouths their treatment and referral patterns are depicted in Figure 6.

**Figure 6: Referral patterns of nurses who never examine patient's mouths**

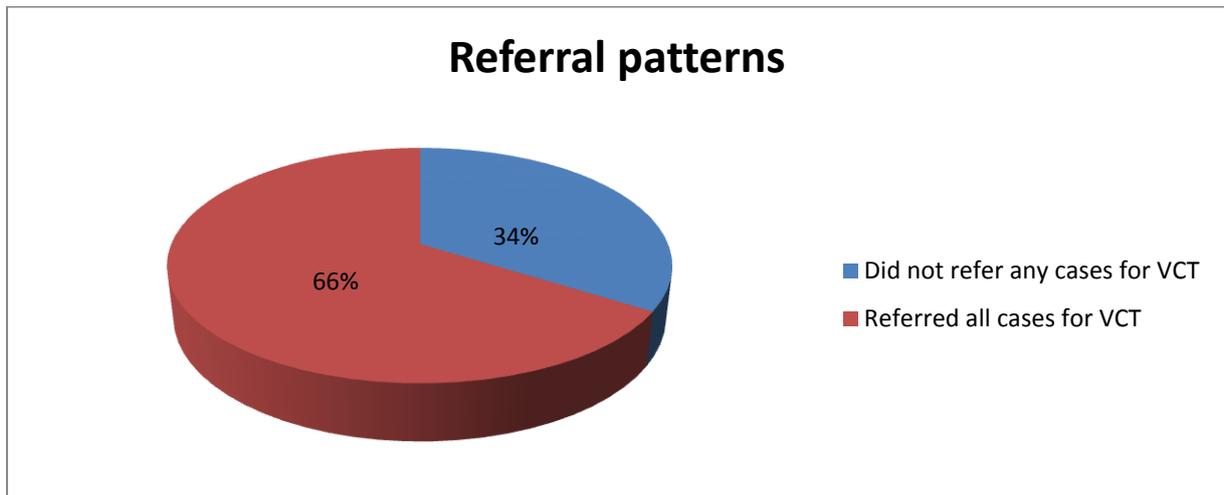


Of those nurses (n=39) who indicated that they occasionally examine patients mouths twenty-eight (71,8%) indicated that they were aware that certain oral conditions were pathognomonic of HIV/AIDS while eleven (28,2%) were not aware of this. Similar results were obtained for nurses responses to knowledge and awareness that certain oral conditions are common oral manifestations of HIV/AIDS, with 36 (92%) indicating that they were aware of certain oral conditions being prognostic of HIV/AIDS, and the remaining three (8%) not being aware of this.

### **VCT referral practices**

When the nurses who occasionally examined patients mouths (n=39) were asked if did refer patients who presented with a HIV/AIDS pre-indicative oral lesion for VCT their responses differed, as indicated in Figure 7.

**Figure 7: VCT Referral patterns of nurses who do not examine patient’s mouths**



An important factor that has the potential to negatively affect the early identification and treatment of HIV-positive patients is that 34% of nurses who do not examine patient’s mouths never refer any patients for VCT. This again represents a missed opportunity for early identification and treatment of HIV-positive persons.

### **Provision of oral health education to patients**

More than two-thirds (85; 70,25%) reported that they see oral health problems often, while thirty-two (25,5%) stated that they only occasionally saw patients with oral health problems. Table 6 depicts the response to the question regarding whether the nurses gave oral health education to their patients.

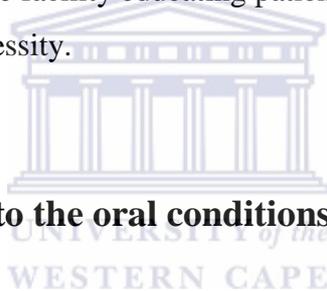
**Table 9: Provision of oral health education to patients**

<b>Oral Health Education given?</b>	<b>Number of nurses (n=121)</b>	<b>Percentage</b>
Yes	87	71,9
No	17	14
Only at patients request	4	3,3
Only If patients require it	13	10,8

Of the study group (n=121), nearly all (n=119; 98,3%) considered oral health promotion to be an important part of their roles as primary health care practitioners, and that it was important to the overall treatment of the patient (n=120, 99%). However nearly two-thirds (n=70; 57,8%) of the nurses (n=121) were of the opinion that oral health promotion should exclusively be the task of oral health care workers (dentist, dental therapist, oral hygienist) and not the task of the PHC nurse.

Seventy percent (n=85) of the study sample (n=121) reported that they referred patients for general dental checkups.

Not all primary health care facilities in the study were staffed by oral health care professionals. Of the sample studied (n=121) seventy-eight (64,5%) were in facilities that had oral health care workers. The need for a Community Oral Health Information worker to be based in their Primary Health Care facility educating patients was reported by nearly all who participated in the study, as a necessity.



### **Pre- and Post-Test results to the oral conditions photographic identification test**

The nurses participated in both a Pre-Education Test and then a Post-Education Test. The results and analyses are presented in Table 10-11.

### **Interpretation of the results**

**Table 10: Analysis Of Variance (ANOVA) Pre-and Post- Test results**

<b>Source</b>	<b>DF</b>	<b>Chi-Square</b>	<b>Pr &gt; ChiSq</b>
<b>Type of lesion</b>	<b>9</b>	<b>265,98</b>	<b>&lt; .0001</b>
<b>Pre_Post</b>	<b>1</b>	<b>155,33</b>	<b>&lt; .0001</b>
<b>Type of lesion Pre_Post</b>	<b>9</b>	<b>15,03</b>	<b>&lt; .0001</b>

Table 8 shows the overall analysis of variance (ANOVA). It is clear from the table that all the effects in the model are highly significant (p-value < 0.0001) for the main effects, i.e. Type of Lesion and Pre- and Post-Test. However the interaction is also significant at 10% level.

The results of the Pre-Education and Post-Education Tests, together with the increase or decrease in the levels of correct results attained were statistically significant (p < 0,001) and can be seen graphically as in Figure 9.

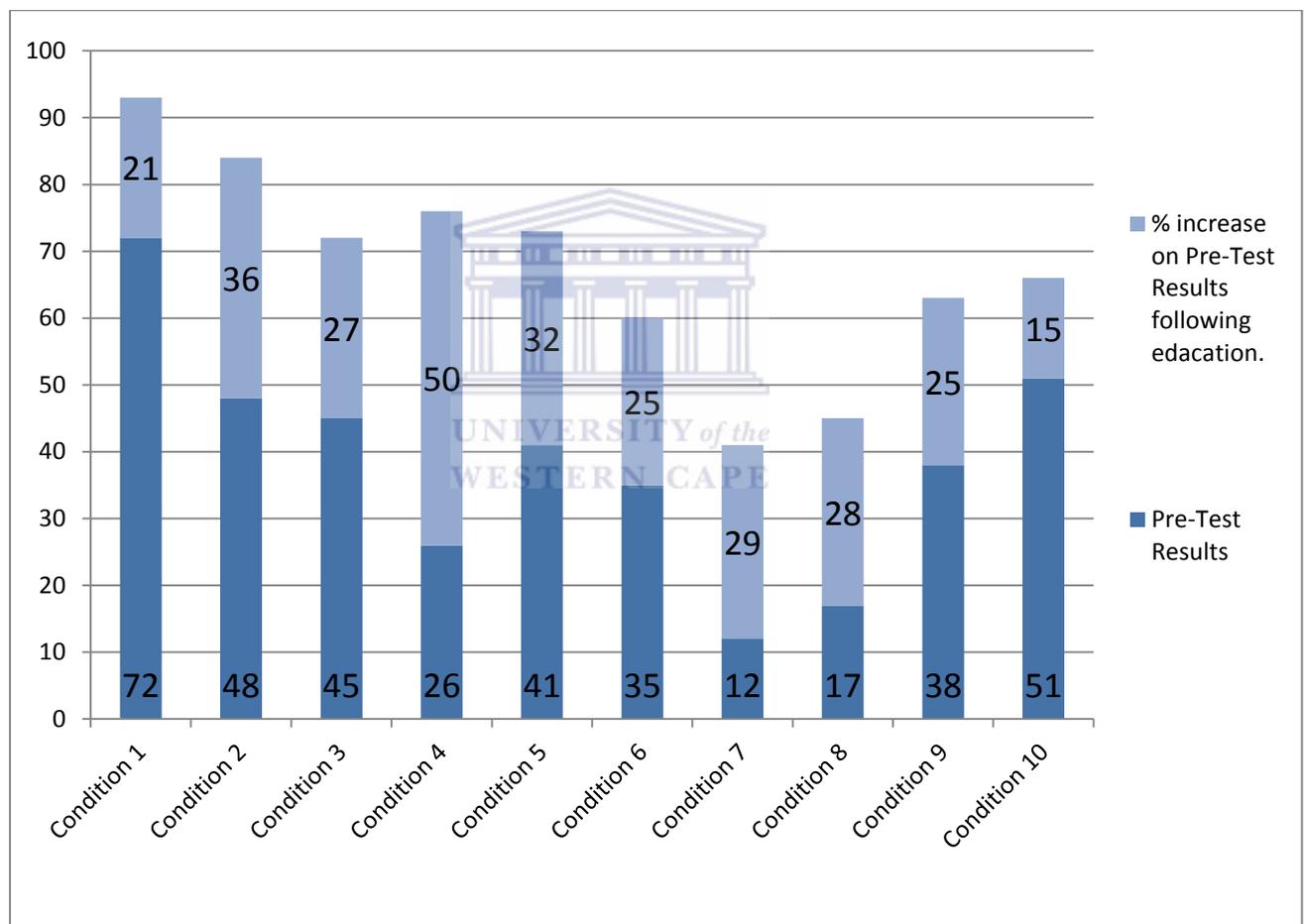
**Table 11: Pre- and Post-Test Results – correct responses only (n=121)**

No	Condition / Disease / Lesion	Pre-test correct	Post-test correct	Percentage difference	Chi-Square	P-value
01	<i>Oral Candidiasis / Oral Thrush</i>	87 (72%)	108 (89%)	17%	10.91	0.0010
02	<i>Angular Cheilitis</i>	59 (48%)	95 (79%)	31%	22.06	<.0001
03	<i>Parotid Gland Enlargement</i>	54 (45%)	81 (67%)	23%	11.99	0.0005
04	<i>Molluscum Contagiosum</i>	31 (26%)	81 (67%)	41%	38.88	<.0001
05	<i>Oral Hairy Leukoplakia</i>	50 (41%)	82 (68%)	27%	16.64	<.0001
06	<i>Herpes Simplex</i>	42 (35%)	67 (55%)	20%	10.27	0.0013
07	<i>Periodontitis</i>	14 (12%)	43 (36%)	24%	17.70	<.0001
08	<i>Kaposi's' Sarcoma</i>	20 (17%)	48 (40%)	23%	15.25	<.0001
09	<i>Aphous Ulcers</i>	46 (38%)	71 (59%)	21%	10.19	0.0014
10	<i>Dental Caries</i>	62 (51%)	77 (64%)	13%	3.78	0.0518
	<i>Mean correct responses/total respondents (n=121) MEAN (Percentage)</i>	<b>46.5/121 (38,5%)</b>	<b>75.3/121 (62,4%)</b>	<b>24%</b>		<b>&lt;.0001</b>

Since our interest lies in this interaction, subsequent analyses aimed at comparing the pre-training correct responses versus the post-training correct responses within each type of lesion. The results of this deeper analysis are reported in Table 11. They indicate that with the exception of “Dental caries” category all the remaining differences between pre-and post are

from very significant ( $p$ -value  $< 0.001$ ) to highly significant ( $p$ -value  $< 0.001$ ). The contrast observed in the “Dental Caries” category (13%) also suggests that the two periods are different since the significance level is so close to the cut-off level of 5%. Therefore this study suggests that a basic education intervention can have significant effects on the knowledge levels of PHC nurses, and it is hoped that this improved knowledge levels will lead to positive changes in the treatment and referral patterns of PHC nurses, to the benefit of the patient base that they service.

**Figure 8: Results Analyses of Pre- and Post-Education Test**



## Correlation of certain variables

Correlation of certain variables using a simple linear coefficient correlation (Pearson's Correlation Coefficient) was carried out using the "Z" test to provide a correlation analysis of selected variables such as age vs. knowledge, experience vs. knowledge etc. These correlations are cross-tabulated in Table 12 below. A p-value of <0.05 was regarded as being statistically significant.

**Table 12: Cross-Tabulation of Select Variables**

Reference Variable	Other Variable	Z Test correlation	P value
Age	undergraduate training in examination of the oral cavity	-0.03573	0.6972
	Training in VCT	-0.00172	0.9852
	Awareness of HIV pre-indicative oral conditions	-0.02721	0.8106
	Awareness of oral manifestations of HIV/AIDS	-0.12379	0.2709
	Referral of patients with oral lesions for VCT	-0.12379	0.2709
Experience as a PHC Nurse	Training in VCT	-0.03573	0.6972
	Awareness of HIV pre-indicative oral conditions	0.04671	0.6788
	Awareness of oral manifestations of HIV/AIDS	0.15308	0.1697
	Referral of patients with oral lesions for VCT	-0.18033	0.2720
Qualification	Routine oral examination practices	-0.13863	0.1294
	Treatment / referral of patients with HIV oral lesions to oral health care worker	0.06998	0.1834
	Refer patients for dental check-ups	-0.02530	0.7830

Grouped age, years of experience and level of qualification were cross-tabulated against selected variables to test for statistical significance. As our sample size is over 100 no consideration will be given to normality assumptions.

The correlation between age and undergraduate training in examination of the oral cavity shows a negative correlation ( $-0.03573$ ) and is not statistically significant ( $p=0.6972$ ). The correlation between age and training in VCT shows a negative correlation ( $-0.00172$ ) and is statistically not significant ( $p=0.9852$ ), showing that there is no correlation between age and training in VCT. The correlation between age and awareness of HIV pre-indicative oral conditions shows a negative correlation ( $-0.02721$ ) and is not statistically significant ( $p=0.8106$ ). The correlation between age and awareness of oral manifestations of HIV/AIDS shows a negative correlation ( $-0.12379$ ) and is statistically highly significant ( $p=0.2709$ ), showing that older nurses are more likely to be aware of the oral manifestations of HIV. The correlation between age and referral of patients with oral lesions for VCT is similar to the correlation of age and referral of patients with oral lesions and shows a negative correlation ( $-0.12379$ ) and is statistically significant ( $p=0.2709$ ), thus reflecting that older nurses are more likely to refer patients with oral lesions for VCT than are younger nurses.

The correlation between experience as a PHC Nurse and training in VCT shows a negative correlation ( $-0.03573$ ) and is not statistically significant ( $p=0.6972$ ). The correlation between experience as a PHC nurse and awareness of HIV pre-indicative oral conditions shows a positive correlation ( $0.04671$ ) and is not statistically significant ( $p=0.6788$ ). The correlation between experience as a PHC nurse and awareness of oral manifestations of HIV/AIDS shows a positive correlation ( $0.15308$ ) and is statistically significant ( $p=0.1697$ ). The correlation between experience as a PHC nurse and referral of patients with oral lesions for VCT shows a negative correlation ( $-0.18033$ ) and is statistically significant ( $p=0.2720$ ), indicating that the more experienced the PHC nurse is the greater the likelihood that the patient presenting with a HIV pre-indicative lesion has of being referred for VCT.

The correlation between level of qualification and routine oral examination practices shows a negative correlation ( $-0.13863$ ) and is statistically significant ( $p=0.1294$ ). The correlation between level of qualification and treatment / referral of patients with HIV oral lesions to oral health care workers shows a positive correlation ( $0.06988$ ) and is statistically significant ( $p=0.1834$ ). The correlation between level of qualification and referring patients for general dental check-ups shows a negative correlation ( $-0.02530$ ) and is not statistically significant

( $p=0.7830$ ). Thus PHC nurses who are diploma or degree qualified are more likely to routinely patients mouths and to refer those patients with oral lesions to oral healthcare workers that are nurses who are qualified as enrolled nurses (staff nurses).

## **Conclusion**

The analysis of the results was described in this chapter indicated varying knowledge, attitudes and treatment patterns. The need for improved education and training, at both a basic and a post-graduate level, in the identification, treatment and referral of oral manifestations and oral health is clearly highlighted. The provision of a basic oral health education package has produced statistically significant improvements in nurses knowledge in nurses knowledge of the oral manifestations of HIV, and such education should be beneficial to all nurses in their holistic management of patients presenting for treatment at Primary Health Care facilities.

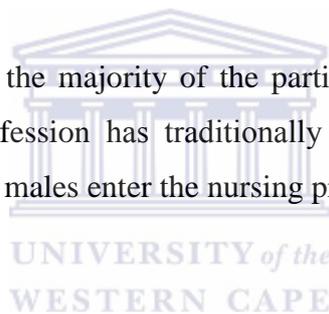
## **CHAPTER 6: DISCUSSION**

### **Introduction**

The aim of the present study was to assess the oral care knowledge, practices and attitudes among primary health care nurses in the uMgungundlovu District of KwaZulu-Natal, South Africa. Such a study has not been conducted in the country before and the results of the study have proved to be enlightening. In this chapter, an overview of the main themes arising from this study will be presented. It will include a discussion on the important issues from the literature review which will be compared with the findings of this study.

### **Demography**

The response rate was 45% and the majority of the participants were female. This is not surprising since the nursing profession has traditionally been seen as a “female” career, although this is changing as more males enter the nursing profession.



### **Qualifications, Experience and Training of Nursing Practitioners**

The participants had a minimum of an Enrolled Nurse qualification. Enrolled nursing assistants (ENA's) and student nurses were excluded from the study, as they act as assistants and are not directly involved with the management of primary health care patients. All the participants worked previously as general nurses prior to being allocated to primary health services/clinics, and thus had a wide range of experience. Based on the Ouagadougou Declaration on Primary Health Care and Health Systems in Africa, South Africa as a signatory employs nurses to render primary health care extensively (Callaghan, 2010). In many instances they serve as a substitute for medical practitioners and are expected to be competent in the assessment, diagnosis and treatment of patients, with training that is current and relevant. Acute shortages of healthcare professionals remain a stumbling block to care for people with HIV in many countries, including South Africa (Callaghan, 2010).

It is thus important that the nurse's knowledge and training remain current and relevant. A minute number of the respondents completed their undergraduate training more than 30 years ago, thirty completed their training between 1981 and 1990, forty-five nurses qualified between 1990 and 1999, the period in which the incidence and prevalence of HIV/AIDS in South Africa was increasing to pandemic proportions. The remainder (37) graduated post-2000, during the peak of the epidemic. It is interesting to note that only 41.2% of nurses with post-graduate PHC qualifications undertook further training (short courses, seminars etc.). What is also of interest was to find that of the nurses with more than 10 years of PHC experience (n=34) only 11 (25%) were aware that certain oral conditions were pre-indicative of HIV. Similar results were reported by Nasir (2001) in a study done amongst nurses in Lesotho. With the majority of the nurses having qualified when the HI virus was very much in the ambit of common presenting medical conditions, and as such one would expect that attending primary health care nurses would have a much greater knowledge of the oral manifestations of HIV than indicated in the results of the pre-test.

### **Post-Graduate Training**



The majority of the sample qualified post-1990. It was assumed that these nurses would have a greater insight into the diagnosis and management of HIV/AIDS. It is interesting to note that of the 34 nurses who undertook postgraduate studies less than half undertook further training in the form of short courses, seminar attendance etc. This lack of further and continuing professional development opportunities for nursing practitioners clearly needs to be resolved, with greater training opportunities being made available to nurses in an attempt to improve overall patient diagnosis, care and prognosis. The need for continuing medical education is reinforced by this study.

### **Training in Diagnosis and Treatment of Oral Conditions**

Demand for primary care services has increased in developed countries due to populations ageing, rising patient expectations and reforms that have shifted care from hospitals to the

community (Laurant et al., 2004). At the same time, the supply of doctors is constrained and there is increasing pressure to contain costs in these times of economic recession. Shifting care from doctors to nurses is one possible response to these challenges. However, they need to be properly trained in order to render an effective and quality service to the public.

Just over ninety percent of the nurses who participated in the study received little or no undergraduate training in the examination, diagnosis and treatment of oral conditions. Numerous studies have reported that nurses lacked the necessary knowledge for oral care (Southern, 2007; Boyle, 1992; Adams, 1996; Paulsson et al., 1999) and that they lacked sufficient education in oral care (Sweeney et al., 1996; Orr and Patient, 2004). It is therefore understandable that 14% of the nurses in the study did not undertake any examination of the oral cavity during the overall examination of the patient. A similar situation exists with the 34 nurses who underwent specialist post-graduate training, with less than half receiving only a basic overview in the examination, diagnosis and treatment of oral conditions. Southern (2007) reported that 85.3% of the nurses had not received any oral care education since qualifying, and that the rest had not received any education in oral health care at all.

There is clearly a crucial lack of training of nursing practitioners in the examination, diagnosis and treatment of oral conditions at both an undergraduate and a postgraduate level, and this has a detrimental effect on the holistic treatment of patient, especially with those patients who through early diagnosis of HIV could achieve improved quality of life through early intervention and the early institution of preventive treatment.

## **Training in VCT, HIV/AIDS Management and the Treatment of Oral Conditions**

The UNAIDS/WHO policy on HIV testing and counselling defines two main categories:

- i) client-initiated HIV testing and counselling (CITC);
- ii) provider-initiated HIV testing and counselling (PITC).

In generalized epidemics such as in South Africa, PITC is recommended for all patients attending health facilities, regardless of whether they show signs or symptoms of underlying HIV infection, or of their reason for coming to a health facility (Cleary et al., 2010).

While the HIV/AIDS pandemic continues to wreak havoc in Sub-Saharan Africa, it is disappointing to note that 80% of the participants in the study did not receive any training in Voluntary Counselling and Testing (VCT). In the WHO 2010 Country Progress Report, KwaZulu-Natal continues to be the most affected province in South Africa, with 37.4% of pregnant woman living with HIV (Cleary et al., 2010). The ability to provide VCT should not be the exclusive domain of VCT counsellors, but should be an essential component in the armamentarium of every single healthcare worker. Only 10% of the nurses who received training in VCT had some form of training in the diagnosis and management of oral conditions, as part of their VCT training. There is a need to integrate prevention and treatment interventions to ensure a most cost-effective and sustainable response to HIV/AIDS. Of even greater concern is that a third of the study group did not receive any training in HIV/AIDS management, and that more than three-quarters of those who did receive some sort of training in HIV/AIDS management, did not have any training in the diagnosis and treatment of oral conditions. This lack of training reinforces the findings of Southern (2007), Boyle (1992) and Sweeney et al., (1996) who found that there is an urgent need for continuing education in oral care for nurses.

### **Assessment and referral patterns**

Robinson et al., (1998) reported that the clinical diagnosis of oral diseases strongly associated with HIV is relatively straightforward. However, oral diagnosis has wider implications than in the management of local disease. Oral examination has gained greater importance as an indicator of HIV infection with the onset of effective treatment for the underlying disease, especially to those who could benefit from treatment but who do not suspect that they are infected or would not ordinarily avail themselves to voluntary counselling and testing (Klein et al., 2003). Early detection of HIV-infection improves prognosis and reduces transmission, especially among sexual partners, but, in the United States, 30%-40% of cases are diagnosed late (Klein et al., 2003). In some settings and especially in primary health care facilities where the patient often has first contact with the primary health care nurse, effective risk

assessment coupled with clinical examination could increase early detection of the infection, and thus allow for early treatment.

A review of nursing practices revealed that oral assessment and care receive minimal attention. (Ridley and Pear, 2008). In clinical practice oral health and oral hygiene is often not regarded as a priority (White, 2000) and these may be a lack of oral health assessment protocols. Of the nurses in the study sample just over two-thirds indicated that they only occasionally or never examined the mouth. Thus the chances of them failing to identify oral lesions that may be pathognomic of HIV/AIDS infection is high, and this clearly indicates a failed opportunity of early diagnosis and treatment that might perhaps prolong, and improve the quality of life of people living with HIV/AIDS.

Eighty-seven percent of the nurses in the study sample referred all cases with HIV/AIDS oral manifestations for VCT, and 13% did not refer any cases for VCT. This is interesting when one considers that 95% of the nurses acknowledged that they were aware of certain oral conditions being prognostic of HIV/AIDS. This indicates a need for nursing practitioners to be trained in appropriate referral practices.

Prevention of oral complications and providing oral care can prevent life-threatening infections and can lead to the provision of better care for patients (Southern, 2007). With easily diagnosed conditions such as oral hairy leukoplakia (OHL), a simple visual assessment can confirm its presence (Terri et al., 1991). OHL has been shown to be highly predictive of AIDS since 83% of those with OHL develop AIDS by 31 months (Terri et al., 1991). Therefore primary health care nursing practitioners have an important role to play in the recognition of oral clinical manifestations of HIV/AIDS infection since they are likely to be the first oral health professionals to interact with patients and to diagnose the occurrence of these lesions.

Africa suffers from the world's most profound crises in human resources for health, with 36 out of 57 African countries facing healthcare worker shortages. Hirschhorn et al., (2007) estimated that in order to provide ART in a resource-limited setting to 1000 patients the staffing requirements would be 1-2 medical doctors, 2-7 nurses, 1-3 pharmacy staff, a number of counsellors and treatment support staff (administrative staff). One can thus infer that considerable human resource cost-savings and reallocation of health human resources can be

achieved in KwaZulu-Natal if early diagnosis, treatment and further prevention of HIV infection, and improved quality of life for these infected persons can be achieved. This is especially relevant in KwaZulu-Natal where it is compounded by the emergence of multi-drug resistant (MDR) and extensively drug resistant (XDR) TB.

Some nurses reported that they never examine the mouth and gave a number of reasons including the fact that it is not their duty but rather that of the dental team. Of the respondents who examined patients' mouths either regularly or occasionally, just fewer than three-quarters were comfortable with examining the mouth, and this was attributed to a lack of training in assessment of the oral cavity at both undergraduate and post-graduate level.

### **Oral health education**

The literature reports that nurses knowledge of OH is often limited (Longhurst, 1998) and this is often due to the absence of oral health education at the prequalification stage. (Boyle 1992). The majority of nurses reported providing oral health education to patients without prompting, and this is indeed a positive sign in ensuring that patients receive optimal health care. This is despite the fact that a large percentage of the nurses in the study sample felt that oral health promotion was the sole domain of oral health care workers (dentists, dental therapists, oral hygienists). In terms of the Phuket Declaration on Oral Health in HIV/AIDS 2004, of which South Africa is a signatory, it is recognised that oral health is an integral part of general health and well-being.

Oral health and nutrition have a synergistic relationship (Naidoo and Myburgh, 2007), and the impact of HIV-associated oral diseases on dietary intake and nutritional status is well known (Naidoo and Myburgh, 2007). Thus it is essential that nurses provide oral health care and advice to patients as good oral health is required in order to eat healthy foods that require chewing. Nearly all confirmed that oral health promotion was important in the overall treatment of the patient but only seventy per cent referred patients for general dental check-ups. The beneficial effect of early diagnosis and treatment of HIV-infected persons is a reason to encourage patients to be tested and should become part of the routine of all nursing practitioners (Robinson et al., 2006).

## **Oral health professionals staffing**

Ogunbodede and Rudolph (2002) reported that in South Africa, a country most severely affected by HIV and AIDS, 16 out of 20 senior officers for HIV/AIDS programmes and/or oral health organizations reported that there were no existing oral health policies on HIV/AIDS in their health care institutions or organizations. Furthermore, none of the interviewees knew of any specific protocols on oral care in HIV/AIDS. This does not bode well for the treatment of HIV/AIDS infected persons who present with oral lesions, and is reflected in the oral healthcare worker staffing at these institutions. There is currently no specialist ART clinic in the uMgungundlovu district that has an oral health care worker attached to it.

More than a third of the nurses practiced in facilities that were not staffed by oral health care professionals, and this highlights the need for primary health care nursing practitioners to become more proficient in the diagnosis, treatment and management of oral conditions. Nearly all saw the need for a community oral health educator who could be based at their facilities, tasked with educating patients on basic oral health care and on the early diagnosis, treatment and management the oral manifestations of HIV/AIDS. This is especially of concern when viewed in terms of the number of oral health care staff in the KwaZulu-Natal province and the high vacancy rates. In 2008 the KwaZulu-Natal Health Barometer reported that there were 69 dentists, 26 dental therapists and 25 oral hygienists' employed by the KZN Department of Health. The reported vacancy rates were 37,3%, 62,9% and 51,9% respectively. Thus these healthcare workers were forced to render services that were aimed at the relief of pain and sepsis, rather than preventive and promotive dentistry.

## **Pre-education and Post-education test results**

The results of the tests are a reflection of the diverse responses to the identification of ten sets of photographs depicting a variety of oral conditions. The most commonly identified oral lesions in both the pre-education test and the post-education test were oral candidiasis (pre-vs. post-test - 72-89%), angular cheilitis (pre-vs. post-test - 48-79%) and parotid gland enlargement (pre-vs. post-test - 45-67%), in keeping with results obtained in a similar study

in Lesotho by Nasir (2001). Leão et al., (2009) reported that the prevalence of candida infections ranged from 1,5-56% in HIV-positive patients. With reference to the conditions that are prognostic of HIV/AIDS; oral hairy leukoplakia (pre-vs. post-test - 41-68%), Kaposi's Sarcoma (pre-vs. post-test - 17-40%) and molluscum contagiosum (pre-vs. post-test - 26-67%); showed notable improvements in their identification in the post-test following basic education. Leão et al., (2009) reported that in HIV-positive patients the prevalence of OHL infections ranged from 0,42-42%, for Kaposi's Sarcoma the prevalence ranged from 0-38%. A study in Lesotho by Nasir (2001) found that only a quarter of nurses were able to recognise OHL, and that 22.1% did not recognise ANUG as oral manifestations of HIV/AIDS. Similar results are reported in this study. This clearly indicates that further, continuous and sustained education and training in the identification, diagnosis and treatment of oral conditions can be highly beneficial to nursing practitioners in general, and to patients in particular. The public health benefits of such education should constitute a significant element of curriculum design of basic and post-graduate nursing training courses. This education and training will be particularly beneficial to the nurses in the study, who daily are confronted by a large number of undiagnosed HIV/AIDS infected patients – patients that will definitely benefit from early diagnosis and early intervention.

### **Limitations of the study**

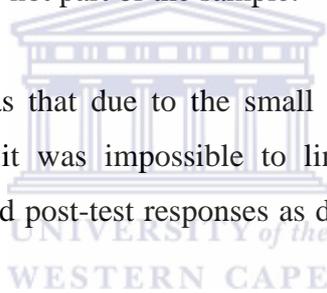
While this study aimed to research the knowledge, practices and attitudes of primary health care nurses in the uMgungundlovu district it should be understood that some of the nurses involved in the assessment and treatment of patients at primary health care institutions have not undergone any specific post-graduate primary health care training or qualification. Furthermore, not all have received training in the provision of voluntary counselling and testing (VCT).

The varying staff-patient ratios at the different study sites may have affected the outcome of the study in that in facilities with a fewer number of patients per day, nurses were able to dedicate more time to each patient and carry out a more thorough assessment of the patient. The KwaZulu-Natal Department of Health has identified, in its 2009 District Health Barometer Report, that a primary health care nurse in the province saw an average of 37 patients a day.

A limitation to the pre- and post-tests may have been the use of colour photographs to depict oral lesions. One of the inherent limitations of the usage of photographs is that it is two-dimensional and does not allow for the use of the critical diagnostic tools such as palpation and physical examination. Furthermore, participants were not provided with a history of the lesion. In the normal course of their duties nurses will consider the clinical presentation as well as the age of the patient, in the assessment and/or identification of the lesion.

An additional limiting factor of the present study could be the fact that the sample was non-randomised. The sample consisted of primary health care nurses who were present at the time the researcher conducted the research (a convenience sample). Those nurses who were on leave, who were late for duties, were busy attending to emergencies and those nurses who were on course or at training were not part of the sample.

An additional limiting factor was that due to the small number of nurses based in some clinics, often just one or two, it was impossible to link the results of the knowledge questionnaire with the pre-test and post-test responses as doing so would have compromised the respondents confidentiality.



## CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

### Conclusion

The aim of the present study was to document the oral HIV knowledge and practices of primary health care nurses and to establish common principles of best practice that could be utilised in the routine examination of patients by primary health care and other para-medical staff. Furthermore identification of pre-indicative HIV oral manifestations was investigated so that early testing, diagnosis and treatment interventions may be provided. Early interventions could be encouraged. Early interventions lead to an improved prognosis for HIV-infected patients, lower treatment costs, prolonged life and reduced pain and suffering (from opportunistic diseases). There is clearly a need for the development of evidence-based oral health education programmes to optimise resource utilisation and allocation effectively (Strebel, 2004). The early identification of HIV could lead to early behavioural changes, a decrease in the HIV opportunistic disease burden and an improvement in the quality of life of HIV-infected individuals (Shobana et al., 2004).

Like many countries (both first and third world) South Africa has a shortage of medical practitioners and other health care workers. With the advent of a democratically elected government in 1994, many primary health care facilities have been built and there is a general move to decrease the number of patients attending out-patients departments (OPD) to primary health care (PHC) clinics. At PHC clinics patients are assessed and treated by primary health care nursing practitioners and, if necessary, referred to a medical doctor or to a larger community health facility/hospital for treatment of conditions that cannot be managed primary health care nursing practitioners. Thus for many patients who utilise public health care facilities their first, and often only, interaction with the health care system is via a primary health care nurse.

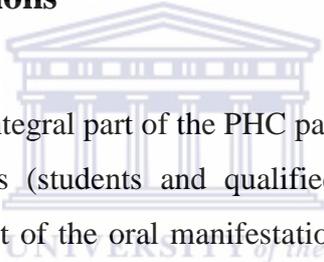
Sub-Saharan Africa continues to have an extra-ordinarily high prevalence of HIV infection and of people living with HIV/AIDS. The area of this study, the KwaZulu-Natal Midlands is ravaged by higher than average HIV/AIDS infection rates, with factors such as a major trucking route traversing across most of it, high unemployment levels, poverty etc., contributing to the epidemic. The response of the South African government to this pandemic has been to encourage VCT together with a myriad other initiatives.

## **Recommendations**

### **Practice Recommendations**

- An assessment of the mouth should be part of the routine assessment of all patients who present for treatment in a primary health care facility. This will ensure that patients that are at risk for HIV infection will be offered VCT; sexual partners could be informed of any risk.
- Nurses should collaborate with oral health care workers in order to become more knowledgeable of their own oral hygiene beliefs and practices, and to gain knowledge of oral hygiene products and their applications so that they can provide appropriate oral health education and treatment to their specific patient population.

### **Educational Recommendations**

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- Oral health should be an integral part of the PHC patient assessment protocol. In order to achieve this all nurses (students and qualified) will require education in the diagnosis and management of the oral manifestations of HIV. Oral health education needs to be incorporated into the nursing curriculum for undergraduate and postgraduate training and in the VCT training programmes.
  - Health care providers and nursing education institutions should make available continuing education opportunities that include oral health assessment, oral hygiene care and treatment as an integral part of health care workforce development.

### **Organization and Policy Recommendations**

- Health care providers and nursing education institutions should develop oral health care policies and programmes that include oral health assessment, oral hygiene care and treatment as an integral part of quality health care provision.
- More oral health professionals are needed to assist the nurses in the field and treat patients referred by the nurses.

## REFERENCES

Abdool Karim, S.S. (2004). Medical education after the first decade of democracy in South Africa. *Lancet*, 363:1395-99.

Abdool Karim, S.S. (1998). *Traditional healers and AIDS Prevention*. Centre for Epidemiological Research in Southern Africa. Durban: South African Medical Research Council.

Abdool Karim, S.S., Coletti, A., Richardson, B., Ramjee, G., Hoffman, I., Chirenje, M., Taha, T., Kapina, M., Maslankowski, L., Soto-Torres, L. (2009). Safety and effectiveness of vaginal microbicides BufferGel and 0.5% PRO 2000 gel for the prevention of HIV infection in women: Results of the HPTN 035 trial [Abstract 48LB]. *16th Conference on Retroviruses and Opportunistic Infections; Montreal, Canada, 8-11 February 2009*.

Adams, R. (1996). Qualified nurses lack adequate knowledge related to oral health, resulting in inadequate oral care of patients on medical wards. *Journal Adv. Nurs*, 24(3),552-60.

Adulyano, S. (1996). *An integrated socio-dental approach to dental treatment need estimation*. Unpublished Ph.D. Thesis, University of London, London, United Kingdom.

Ageblusi, G.A. and Wright, A.A. (2005). Oral lesions as indicators of HIV infection among routine dental patients in Lagos, Nigeria. *Oral Diseases*, 11, 370–373.

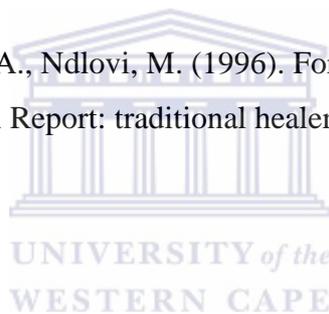
AIDSMAP. (2010). [www.aidsmap.com/en/news/KnowledgeCentre/HIVData](http://www.aidsmap.com/en/news/KnowledgeCentre/HIVData). Last accessed 22/08/2010.

Akpede, G.O., Ambe, J.P., Rabasa, A.I., Makuhwa, D.R., Ajayi, B.B., Akoma, M.A. (1997). Presentation and outcome of HIV-1 infection in hospitalised infants and other children in north-eastern Nigeria. *East Afr Med Journal*, 74, 21-27.

Aneshensel, L.I., Mullin, C.S., Pearlin, J.P., Zarit, S.H., Whitlach, C.J. (1995). *Profiles in Caregiving: The Unexpected Career*. San Diego, CA: Academic Press.

Arendorf, T.M., Bredenkamp, B. and Cloete, C.A., Sauer, G. (1998). Oral manifestations of HIV infection in 600 South African patients. *Journal of Oral Pathology and Medicine*, 27, 176-179.

Baggaley, R., Sulwe, J., Burnett, A., Ndlovi, M. (1996). Forging links between the formal and traditional in Zambia. Special Report: traditional healers. *AIDS Analysis Africa*, 6(1),12-3.



Balasundaram, S. (2004). Awareness of occupational exposure to HIV infection among dental surgeons in Chennai, South India—a KAB study. *Adv Dent Res*, 19,169.

Baumgarten, M. (1989). The health of persons giving care to the demented elderly: A critical review of the literature. *Journal of Clinical Epidemiology*. 42, 1137-1148.

Benatar, S.R. (2004). Health care reform and the crises of HIV and AIDS in South Africa. *N. Engl J Med*, 351, (1), 81-92.

Bhayat, A. (2007). *Predictive value of group I oral lesions in detecting HIV infection amongst patients attending PHC facilities in Gauteng*. Unpublished Masters research report, University of the Witwatersrand, Johannesburg.

Bhayat, A. and Cleaton-Jones, P. (2003). Dental clinic attendance in Soweto, South Africa, before and after the introduction of free primary dental health services. *Community Dent Oral Epidemiol*, 31, 105–10.

Bhayat, A., Yengopal, V., Rudolph, M.J. Govender, U. (2008). Attitudes of South African dental therapy students toward compulsory community service. *Journal of Dental Education*, 1135-1142.

Bickley, L.S., Szilagyi, P.T.G., ed. (2003). *Head and neck :In Bates guide to physical exam and history taking*. 8<sup>th</sup> ed., Philadelphia: Lippin Scott.

Boyle, S. (1992). Assessing mouth care. *Nurs Times*, 88(15), 44-6.

Bowens, S.R. (2000). Global devastation: sub-Saharan Africa. *Women Alive*. 14.

Breier, M., Wildschut, A., Mgqolozanz, A. (2006). *Nursing in a new era: The profession and education of nurses in South Africa*. Cape Town. HRSC Press.

Buve, A., Foaster, S.D., Mbwili, C., Mungo, E., Tollenare, N., Zeko, M. (1994). Mortality among female nurses in the face of the AIDS epidemic: A pilot study in Zambia. *AIDS*; 8, 396-401.

Callaghan, M., Ford, N., Schreider, H. (2010). A systematic review of task-shifting for HIV treatment. *Human resources for health*, 8,8-12.

Cameron, E. (2002). *AIDS denial in South Africa*. Greenbag Journal of Law. Lexis Nexis.

Campbell, C., Foulis, C.A., Sbondile, M.A., Sibiya, Z. (2005). "I Have an Evil Child at My House": Stigma and HIV/AIDS Management in a South African Community. *American Journal of Public Health*, 95,5.

Challacombe, S.J., Naglik, J.R. (2006). The effects of HIV infection on oral mucosal immunity. *Adv Dent. Res*, 19, 29-35.

Chidzonga, M.M. (2003). HIV/AIDS orofacial lesions in 156 Zimbabwean patients at referral oral and maxillofacial surgical clinics. *Oral Diseases*, 9,317-322.

Chipfakacha, V.G. (1997). STD/HIV/AIDS knowledge, beliefs and practices of traditional healers in Botswana. *AIDS Care*, 9(4), 417-25.

Cleary, S.M., Slade, G.D., McIntyre, M.I. (2010). Claims on health care: a decision-making framework for equity, with application to treatment for HIV/AIDS in South Africa. *Health Policy and Planning*, 1-7.

Coates, E., Slade, G.D., Goss A.N., Gorkic, E. (1996). Oral conditions and their social impact among HIV dental patients. *Aust Dent J*, 41, 33-36.

Colebunders, R., Ryder, R., Francis, H., Nekwei, W., Bahwe, Y., Lebughe, I., Perriens, K., Nsimba, A., Turner, H., Francis, P., Van der, S. (1991). Seroconversion rate, mortality and clinical manifestations associated with the receipt of a human immunodeficiency virus infected blood transfusion in Kinshasa, Zaire. *J Infect Dis*, 165, 450- 456.

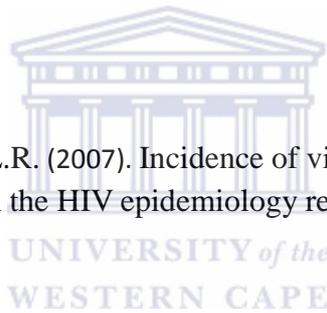
Coogan, M., Challacombe, S. (2011). The mouth and AIDS: the global challenge. *J Dent Res*, 90, 397-399.

Coovadia, H.M. (2000). Access to HIV counselling and testing in developing countries, 2<sup>nd</sup> conference on Global Strategies for the Prevention of HIV Transmission from mothers to infants, Montreal, Canada, 1-6 September, abstract no. 094.

Courtright, P., Chirambo, M., Lewallens, S., Kanjalotis, N. (2000). *Collaboration with African traditional healers for the prevention of blindness*. Singapore: World Scientific Publishers.

Day, J.H., Miyamura, A.D., Grant, A.D., Leeuw, A., Munsamy, J., Baggaley, R., Churchyard, G.J. (2003). Attitudes to HIV voluntary counselling and testing in South Africa: will availability of antiretroviral therapy encourage testing? *AIDS CARE* (October 2003), 155, 665-672.

Dlamini, P.S., Kohi, T.W., Uys, L.R. (2007). Incidence of violence against HIV-infected and uninfected women: Findings from the HIV epidemiology research (HER) study. *Journal of Urban Health*, 79(4), 512–524.



Deacon, H. (2006). Towards a Sustainable Theory of Health-Related Stigma: Lessons from the HIV/AIDS Literature. *Jnl of Comm. and Applied Social Psychol.*, 16, 418-425.

Department of Health (DOH). (2000). *Primary Health Care Package for South Africa – a set of norms and standards*. Pretoria. Available at [www.doh.gov.za/docs/policy/norms/full-norms.html](http://www.doh.gov.za/docs/policy/norms/full-norms.html) - . Last accessed 22/02/2010.

Department of Health. (2008). *Nursing Strategy for South Africa, 2008*. Available at [http://www.doh.gov.za/docs/nursing\\_strategy-f.html](http://www.doh.gov.za/docs/nursing_strategy-f.html). Accessed on 19 March 2010.

District Health System in South Africa. Pretoria. March. 2000. Available at <http://www.doh.gov.za/docs/policy/dhsystem.html>. Last accessed 22/02/2010.

Department of Health (DOH). (2003). Operational plan for comprehensive HIV and AIDS care, management and treatment, SA. Pretoria: Available at [www.info.gov.za/otherdocs/2003/aidsoperationalplan.pdf](http://www.info.gov.za/otherdocs/2003/aidsoperationalplan.pdf) . Last accessed 21/04/2010.

Department of Health (DOH). (2007). HIV and AIDS and STI strategic plan for SA, 2007-2011. Available at <http://www.doh.gov.za/docs/misc/stratplan-f.html>. Last accessed 22/02/2010.

Dorrington, R.E., Bradshaw, D., Johnson, L., Daniel, T. (2006). *The Demographic Impact of HIV and AIDS in South Africa. National and Provincial Indicators 2006*. Cape Town: Centre for Actuarial Research. South African Medical Research Council, Actuarial Society of South Africa.



Egusa, H.I., Soysa, N.S., Ellepola, A.N., Niroshani, S.S., Arjuna, N.E., Hirofumi, Y., Lakshman, P.S. (2008). Oral candidiasis in HIV-infected patients. *Current HIV research*, 6, 485-499.

Erasmus, S., Luiters, S., Brijlal, P. (2005). Oral Hygiene and dental student's knowledge, attitude and behaviour in managing HIV/AIDS patients. *Int J Dent Hygiene*, 3, 213-217.

Fauci, A.S., Clifford-Lane, H. Human Immunodeficiency Virus (HIV) disease: AIDS and related disorders. In: Braunwald, E., Hauser, S.L., Fauci, A.S., Long, D.L., Kasper, D.L., Jameson, J.L. editors. *Harrison's Principles of Internal Medicine*. 15th ed. New York: McGraw- Hill, 2,1852-912.

Ferreira, S., Noce, C., Silva Jnr, A., Goncalves. L., Torres, S., Meeks, V., Luiz, R., Dias, E. (2007). Prevalence of oral manifestations of HIV infection in Rio De Janerio, Brazil from 1988 to 2004. *AIDS Patient Care and STDs*, 21, (10),724-731.

Fitch, J.A., Munro, C.L., Glass, C.A., Pellegrini, J.M. (1999). Oral case in adult I.C.U. *Am J Cnt Care*, 8(5), 314-8.

Fylkesnes, K., Siziya, S. (2004). A randomized trial on acceptability of voluntary HIV counseling and testing. *Trop Med Int Health*, 9, 566-573.

Gebrekrstos, H.T., Lurie, M.N., Mthethwa, N., Abdool Karim, Q. (2005). Knowledge and Acceptibility of HAART among TB patients in Durban, South Africa. *AIDS Care*, 17(6), 767-772.

Ginwala, S.K., Grant, A.D., Day, J.H., Dlova, T.W., Macintyre, S., Baggaley, T., Churchyard, G.J. (2002). Use of UNAIDS tools to evaluate HIV voluntary counselling and testing services for mineworkers in South Africa. *AIDS CARE*, 14(5),707-726.

Golafshani, Nahid. (2003). Understanding reliability and validity in qualitative research, The Qualitative Report, 8(4), 597-607. Available at <http://www.nova.edu/ssss/QR/QR8-4/golafshani.pdf>, . Last accessed 24 June 2011.

Green, E. (2000). The role of traditional healers, Southern Africa. *AIDS Action*, 46, 2-3.

Greenspan, D., Canchola, A.J., Greenspan, J.S. (2001). Effects of HAART on frequency of oral warts. *Lancet*, 357,1411-2.

Greenspan, D., Greenspan, J.S. (1996). HIV-related oral disease. *Lancet*, 3348, 729-733.

Greenspan, D., Greenspan, J.S. (1997). Oral manifestations of HIV infection. *AIDS Clin Care*, 9, 29-33.

Greenspan, J.S., Greenspan, D. (2002). The epidemiology of the oral lesions of HIV infection in the developed world. *Oral Dis*, 8 (Suppl 2), 34-39.

Grossi, S.G., Genco, R.J. (1998). Periodontal disease and diabetes mellitus: a two-way relationship. *Annals of Periodontology*, 3, 51-61.

Guay, L.A., Musoke, P., Fleming, T., Bagendra, D., Allen, M., Nakabiito, C., Sherman, J., Bakaki, P., Ducar, C., Deseyve, M., Emel, L., Mirochnick, M., Fowler, M.G., Mofenson, L., Miotti, P., Dransfield, K., Bray, M., Jackson, M.B. (1999). Intrapartum and neo-natal single dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda: HIVNET 012 randomised trial. *Lancet*, 354, 795-802.

Health Systems Trust. (2002). *Health systems review*. Henry J Kaiser Foundation: South Africa.

Heywood, W.L, Batter, V.L, Malulu, M., Mbuyi, N., Mbu, L. (1993). Impact of HIV counselling and testing among child-bearing women in Kinshasha, Zaire. *AIDS*, 7, 1633-1637.

Hirschhorn, L.R., Ojikutu, B., Rodriguez, W. (2007). Research for change: using implementation research to strengthen HIV care and treatment scale-up in resource-limited settings. *J Infect Dis*, 196(3), S516-S522.

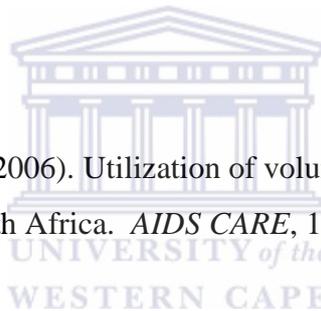
Hodgson, T.A., Greenspan, D., Greenspan, J.S. (2006). Oral lesions of HIV disease and HAART in industrilised countries. *Lancet*, 657, 2811-2819.

HSRA HIV/AIDS Bureau. (2002). *Providing HIV/AIDS care in a changing environment*. Available at [www.hab.hsra.gov/publications/april2002](http://www.hab.hsra.gov/publications/april2002). Last accessed on 25 July 2010.

Health System Trust (HST). Health statistics : Health personnel. Durban : HST. Available online at [www.hst.org.za/health/ In dest.php? Intype\\_id-004002](http://www.hst.org.za/health/In%20dest.php?Intype_id-004002). Last accessed 27/07/2011.

Hughes, J., *et al.* (2004). The health-related quality of life of people living with HIV/AIDS. *Disabil Rehabil*, 26(6), 371-6.

Hutchinson, P.L., Mahlalela, X. (2006). Utilization of voluntary counselling and testing services in the Eastern Cape, South Africa. *AIDS CARE*, 18(5), 446-455.



Irungu, T.K, Varkey, P., Cha, S., Patterson, J.M. (2008). HIV VCT in Nakuru, Kenya: findings from a community survey. *HIV Medicine* (2008), 9, 111-117.

Jackson, H. (2002). *Aids - Africa Continent in crises*. Harare: SAfAIDS.

Jelsma, J., Maclean, E., Hughes, J., Tinise, X., Darder, M. (2005). An investigation into the health-related quality of life of individuals living with HIV who are receiving HAART. *AIDS Care*, 5, 579-88.

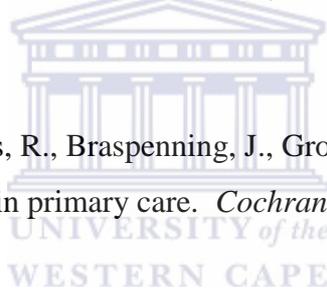
Johnson, N.W., Glick, M., Mbuguye, T.N.L. (2006). Oral health and general health. *Advances in Dental Research*, April 1, 19(1), 118-121.

Kippax, S. (2006). A public health dilemma: a testing question. Based on a presentation at AIDS Impact Conference, Cape Town, 4-7 April 2005. *AIDS Care*, 18(3), 230-235.

Klein, R.S., Harris, C.A., Small, C.B., Moll, B., Lesser, M., Friedland, G.H. (1984). Diagnosis in high-risk patients: the initial manifestations of AIDS. *N.Engl.J. Med*, 311, 354-358.

Knight, J. (2003). Diagnosing oral mucosal lesions. *Physician Assistant*, 27 (3), 34-43.

Laurant, M., Reeves, D., Hermens, R., Braspenning, J., Grol, R., Sibbald, B. (2004). Substitution of doctors by nurses in primary care. *Cochrane Database of Systematic Reviews*, 4.



Leão, J.C., Ribeiro, M.M.B., Carvalho, A.A.T., Frezzini, A., Porter, S. (2009). Oral complications of HIV disease. *Clinics*, 64(5), 459-470.

Lewis, H., Mistry, M., Rudolph, M.J., Marambana, S., Monyatsi, V., Ramela, P. (2001). Oral health practices of traditional healers in Zonkiziziwe and Dube. *Journal of Dental Research*, 80(4), 1363.

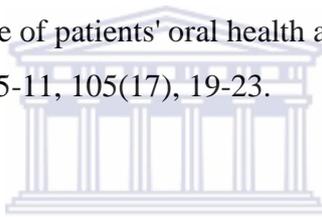
Lewis, D.K., Callaghan, M., Phiri, K., Chipwete, J., Kublin, J.G., Borgstein, E., Zijlstra, E.E. (2003). Prevalence and indicators of HIV and AIDS among adults admitted to medical and surgical wards in Blantyre, Malawi. *Trans R Soc Trop Med Hyg*, 97, 91-96.

Limeback, H. (1998). Implications of oral infections on systemic diseases in institutionalised elderly. *Ann Periodontol*, 3(1), 262-75.

Longhurst, R.M. (1998). A cross-sectional study of oral healthcare instructions given to nurses during their basic training. *Br Dent J*, 184, 453-7.

Louwagie, G.M., Bachmann, M.O., Meyer, K., Booysen, F.R., Fairall, L.R., Heunis, C. (2007). Highly active antiretroviral treatment and health related quality of life in South African adults with human immunodeficiency virus infection: A cross-sectional analytical study. *BMC Public Health*, 7, 244.

Malkin, B. (2009). The importance of patients' oral health and nurses role in assessing and maintaining it. *Nurs Times*. May 5-11, 105(17), 19-23.



Maman, S., Mbwambo, J., Hogan, N.M., Kilonzo, G.P., Sweat, M. (2001). Women's barriers to HIV-1 testing and disclosure: challenges for HIV-1 voluntary counselling and testing. *AIDS Care*, 13(5), 595-603.

Marais, H. (2000). *To the edge. AIDS review*. Pretoria: University of Pretoria.

Maughan-Brown, B.G. (2006). Attitudes towards people with HIV/AIDS: Stigma and its determinants amongst young adults in Cape Town, South Africa. *South African Review of Sociology*, 37(2), 165-188.

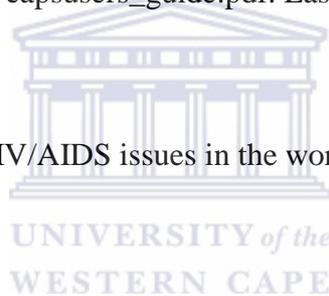
Mayanja, B., Morgan, D., Ross, A., Whitworth, J. (1999). The burden of mucocutaneous conditions and the association with HIV-1 infection in a rural community in Uganda. *Trop Med Int Health*, 4, 349-354.

McInerney, P.A., et al. (2008). Quality of life and physical functioning in HIV-infected individuals receiving antiretroviral therapy in KwaZulu-Natal, South Africa. *Nurs Health Sci*,10(4), 266-72.

Mills, E., Singh, S., Wilson, K., Peters, E., Onia, R., Kanfer, I. (2006). The challenges involving traditional healers in HIV/AIDS care. *International Journal of STD and AIDS*, 17, 360-363.

Mills, E. (2004). Beyond the disease of discrimination: A critical analysis of HIV-related stigma in KTC, Cape Town (Rep. No. CSSR Working Paper No. 100). University of Cape Town: centre for Social Research Science research. Available at [www.cssr.uct.ac.za/resource/caps/capsusers\\_guide.pdf](http://www.cssr.uct.ac.za/resource/caps/capsusers_guide.pdf). Last accessed 24 May 2010.

Minaar, A., Bodkin, J. (2005). HIV/AIDS issues in the workplace of nurses. *Curantis*, 28 (3), 31-38.



Moon, H.S, Jung, J.Y., Horowitz, A.M., Paik, D.I. (1998). Korean Dental hygienists knowledge and their opinions about aetiology and prevention of dental caries. *Community Dentistry and Oral Epidemiology*, 26 (5), 296-302.

Nachege, J.B., Lehman, D.A., Hlatshwayo,D., Mothopeng, R., Chaisson, R.E., Karstaedt, A.S. (2005). HIV/AIDS and Antiretroviral Treatment Knowledge, Attitudes, Beliefs, and Practices in HIV-Infected Adults in Soweto, South Africa. *J Acquir Immune Defic Syndr*, 38 (2), 196-201.

Naidoo, S. (1997). Dental practitioner risk, knowledge and practice with regard to the hepatitis B vaccination in South Africa. *Oral Diseases*, 3, 172–175.

Naidoo, S., Chikte, U. (1999). HIV/AIDS – the evolving pandemic and its impact on oral health in Sub-Saharan Africa. *South African Dental Journal*. 54, 616-630.

Naidoo, S., Myburgh, N. (2007). Nutrition, oral health and the young child. *Maternal and child nutrition*, 3, 312-321.

Nasir, E.F. (2001). *Determination of oral health knowledge, attitudes and behaviour among nursing staff in Lesotho*. Unpublished master's thesis, University of the Western Cape, Tygerberg, South Africa.

Nevin, T. (2000). Sangomas: Bridging the gap between traditional healing and biomedicine. *Business Doctor*, 12-15.

Nkhoeli, Z.M.D. (2005). *Atteridgeville prisoners experiences of HIV/AIDS pre- and post-test counselling*. Unpublished master's thesis, University of Pretoria, Pretoria, South Africa.

Nuwagaba-Biribonwoha, H., Mayon-White, R.T., Okong, P., Carpenter, L.M., Jenkinson, C. (2006). The impact of HIV on maternal quality of life in Uganda. *AIDS Care*, 18(6), 614-20.

O'Keefe, J.P. (2006). HIV knows no discrimination. *JCDA*, 72(3), 189.

Ogunbodede, E.O., Rudolph, M.J. (2002). Policies and protocols for preventing transmission of HIV infection in oral health care in South Africa. *S Afr Dent J*, 57, 469-475.

Onah, H.E., Ibeziako, P.O., Nkwo, P.O., Obi, S.N., Nwankwo, T.O. (2008). Voluntary counselling and testing (VCT) uptake, nevirapine use and infant feeding options at the University of Nigeria Teaching Hospital. *Jnrl of Obstetrics and Gynaecology*, 28(3), 276-279.

Orr, N., Patient, D. (2004). Stigma beliefs cause behaviour. *AIDS Bulletin*, 13(1).10-14.

Patton, L.L., McKaig, R.G., Eron, J.J., Lawrence, H.P., Strauss, R.P. (1999). Oral hairy leukoplakia and oral candidiasis as predictors of HIV viral load. *AIDS*, 13, 2174-2176.

Patton, L.L., McKaig, R., Strauss, R., Rogers, D., Eron, J.J. Jr. (2000). Changing prevalence of oral manifestations of human immuno-deficiency virus in the era of protease inhibitor therapy. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, 89, 299–304.

Paulsson, G., Niderfors, T., Fridlund, B. (1999). Conceptions of oral health among nurse managers. A qualitative analysis. *J Nurs Manag*, 7(5), 299-306.

Petersen, P.E., Kwan, S. (2004). Evaluation of community- based oral health promotion and oral disease prevention – WHO recommendations for improved evidence in public health practice. *Community Dental Health*, 21, 319 -329.

Petersen, P.E. (2005). The burden of oral disease : challenges to improving oral health in the 21<sup>st</sup> century. *Bulletin of the world health organization*, 83(1), 3.

Pool, R., Nyazi, S., Withworth, J. (2001). Attitudes to VCT for HIV among pregnant women in rural South-West Uganda. *AIDS Care*, 13, 603-615.

Porter, S.R. Xerostomia. (2006). *Oral. Dis*, 12 (Suppl 1), 4.

Pretorius, E. (1999) *Traditional Healers*. In: Baron, P. (ed.) South African Health Review 1999. Durban: *Health Systems Trust*, Chapter 18.

Pronyk, P.M., Kim, J.C., Makhubele, M.B., Hargreaves, J.R., Mohlala, R., Hausler, H.P. (2002). Introduction of voluntary counselling and rapid testing for HIV in rural South Africa: from theory to practice. *AIDS CARE*, 14 (6), 859-865.

Puckree, T., Mkhize, M., Mgobhozi, Z., Lin, J. (2002). African traditional healers: what health care professionals need to know. *Int J Rehabil Res*, 25(4), 247-51.

Puranwasi, R. (2006). *The role of traditional healers in oral health care in KwaZulu -Natal*. Unpublished master's mini-thesis, University of the Western Cape, Tygerberg, South Africa.

Ranganathan K., Hemalatha, R. (2006). Oral lesions in HIV infection in developing countries: an overview. *Adv Dent Res*, 19(1), 63-8.

Reichert, P.A. (2006). HIV-Changing patterns in HAART era, patients quality of life and occup. risks. *Oral Dis*, 12(1), 3.

Ridley, K.J., Pear, S.M. (2008). Oral health assessment: a neglected component of comprehensive oral care. *Healthcare purchasing news*, August 2008.

Robberstad, B., Olsen, J.A. (2010). The health related quality of life of people living with HIV/AIDS in sub-Saharan Africa. *Jnrl Cost Effec and Resource Alloc*, 3(21), 737-742.

Robinson, P.G., Challacombe, S.J., Sheiham, A. (1998). Oral examination: a screening tool for HIV infection? *Sex Transm Infect*, 74, 345-348.

Robinson, P.G. (2006). Implications of HIV Disease for Oral Health Services. *Advances in Dental Research*, 119(1), 73-79.

Rothenberg, K., Paskey, S., Reuland, M., Zimmerman, S., North, R. (1998). Domestic violence and partner notification: implications for treatment and counselling of women with HIV. *Journal of American Medical Women's Association*, 50, 87-93.

Rudolph, M.J. (1996). Traditional healers learn they have a role to play in Tanzania's AIDS-control program. *AIDS Journal Afr*, 6(1), 12-13.

South Africa Nursing Council (SANC). (2007). Statistics. Available at [www.sanc.co.za/stats.htm](http://www.sanc.co.za/stats.htm). Last accessed on 20 May 2010.

South Africa Qualification Authority (SAQA).(2007). Bachelor of Nursing. Registered Qualification No.59257. Available at [www.regqs.saq.org.za/viewQualification.php?id=59257](http://www.regqs.saq.org.za/viewQualification.php?id=59257). Last accessed on 13 July 2010.

Schaay, N., Sanders, D. (2008). International Perspective on Primary Health Care Over the Past 30 Years. In: Barron, P., Roma-Reardon, J., editors. *South African Health Review 2008*. Durban: Health Systems Trust; 2008. Available at [www.hst.org.za/publications/841](http://www.hst.org.za/publications/841). Last accessed 26 May 2010.

Schiodt, M., Bakilana, P.B., Hiza, J.F., Shao, J.F., Bygbjerg, I.B., Mbaga, I., Vestergaard, B.F., Nielsen, C.M., Lauritzen, E., Lerche, B. (1990). Oral candidiasis and hairy leukoplakia correlate with HIV infection in Tanzania. *Oral Surgery, Oral Medicine and Oral Pathology*, 69, 591-596.

Scully, C., Laskaris, G., Pindborg. J. (1991). Oral manifestations of HIV infection and their management I – More common lesions. *Oral Surg Oral Med Oral Pathol*, 71, 158-166.

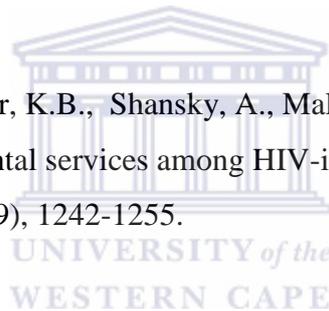
Shaffer, N., Chuachoowong, R., Mock, P.A., Bhadrakom, C., Siriwasin, W., Young, N.L., Chotpitayasunondh, T., Chearskul, S., Roongpisuthipong, A., Chinayon, P., Karon, J., Mastro, T.D., Simonds, R.J. (1999) Short-course zidovudine for perinatal HIV-1 transmission in Bangkok, Thailand: a randomised controlled trial. *The Lancet*, 353, 773-780.

Shangase, L., Feller, L., Blignaut, E. (2004). Necrotising ulcerative gingivitis/periodontitis as indicators of HIV-infection. *S Afr Dent J*, 59, 105-108.

Sheiham, A. (2005). Oral health, general health and quality of life. *Bulletin of the World Health Organization*, 83(9), 644-645.

Shetty, K. (2004). Oral opportunistic infections in HIV-positive individuals: review and role of mucosal immunity. *AIDS Patient Care STDS*, 18, 443-456.

Shiboski, C.H., Cohen, M., Weber, K.B., Shansky, A., Malvin, K., Greenblat, M.R. (2004). Factors associated with use of dental services among HIV-infected and high-risk uninfected women. *J Am Dent Assoc*, 136 (9), 1242-1255.



Shisana, O., Hall, E.J., Maluleke, R., Chauveau, J., Schwabe, C. (2004). HIV/AIDS prevalence among South African health workers. *South African Medical Journal*, 94, 846-50.

Shobana, A., Guha, S.K., Neogi, D.K. (2004). Mucocutaneous manifestations of HIV infection. *Indian J Dermatol Venereol Leprol*, 70, 82-6.

Simpson, W.M., Johnstone, E.D., Goldhert, D.J., Gormley, S.M., Hart, G.J. (1999). Antenatal HIV testing assessment of a routine, voluntary approach. *BMJ*, 318, 1660-1.

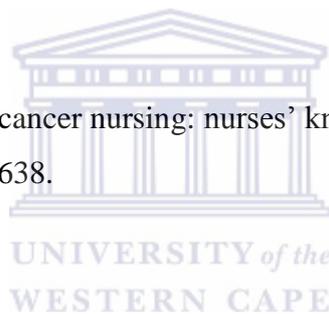
South African National AIDS Council. (2007). *HIV and AIDS and STI Strategic Plan for South Africa 2007-2011*. Pretoria: SANAC.

South Africa Yearbook 2006-2007. GCIS Resource centre. Available at [http://www.gcis.gov.za/resource\\_centre/sa\\_info/yearbook/2006-07.htm](http://www.gcis.gov.za/resource_centre/sa_info/yearbook/2006-07.htm). Last accessed 23 August 2010.

South Africa Yearbook 2007-2008. GCIS Resource centre. Available at [http://www.gcis.gov.za/resource\\_centre/sa\\_info/yearbook/2007-08.htm](http://www.gcis.gov.za/resource_centre/sa_info/yearbook/2007-08.htm). Last accessed 23 August 2010.

South Africa Yearbook 2008-2009. GCIS Resource centre. Available at [http://www.gcis.gov.za/resource\\_centre/sa\\_info/yearbook/2008-09.htm](http://www.gcis.gov.za/resource_centre/sa_info/yearbook/2008-09.htm). Last accessed 23 August 2010.

Southern, H. (2007). Oral care in cancer nursing: nurses' knowledge and education. *Journal of Advanced Nursing*, 57(6), 631-638.



Ssali, A., Butler, L.M., Kabatesi, D., King, R., Namugenyi, A., Kanya, M.R., Mandel, J., Chen, S.Y., McFarland, W. (2005). Traditional Healers for HIV/AIDS Prevention and Family Planning, Kiboga District, Uganda: Evaluation of a Program to Improve Practices, *AIDS and Behavior*, 9(4), 485-493.

Strasser, S., London, L., Kortenbout, E. (2005). Developing a competency framework and evaluation tool for primary care nursing in South Africa. *Education for health*, 18(2), 133-144.

Strebel, A. (2004). *A literature review of evidence-based interventions for home-based child-centered development*. Cape Town: HSRC Publishers.

Sweat, M., Gregorich, S., Sangiwa, G., Furlonge, C., Balmer, D., Kamenga, C., Grinstead, O., Coates, T. (2000). Cost-effectiveness of voluntary HIV-1 counselling and testing in reducing sexual transmission of HIV-1 in Kenya and Tanzania. *Lancet*, 356 (9224), 113-121.

Sweeney, M.P., Bagg, J.P., McGill, M., Milligan, S., Malarkey, C. (1996). Provision of mouth care by nursing staff for patients with cancer in Scotland: current status and the role of training. *Dental Update*, 1(5), 389-395.

Terri, S.I., Donna, J.S. (1991). Recognition of HIV/AIDS associated oral lesions by the dental team. *Clinical preventive dentistry*, 13, 5.

UNAIDS/WHO:2008. Epidemiological Fact Sheet on HIV and AIDS, 2008 update.

Available at

[www.apps.who.int/globalatlas/predefinedReports/EFS2008/full/EFS2008\\_ZA.pdf](http://www.apps.who.int/globalatlas/predefinedReports/EFS2008/full/EFS2008_ZA.pdf). Last accessed on 30 November 2010.



UNAIDS:2009. AIDS epidemic update. Available at

[www.data.unaids.org/pub/Report/2009/jc1700\\_epi\\_update\\_2009\\_en.pdf](http://www.data.unaids.org/pub/Report/2009/jc1700_epi_update_2009_en.pdf), last accessed 25/11/2010.

UNAIDS:2010. UNAIDS Report on the Global AIDS Epidemic – 2010. Available at

[www.unaids.org/globalreport/Global-Report/htm](http://www.unaids.org/globalreport/Global-Report/htm), last accessed 30/06/2011.

Urassa, P., Gosling, R., Pool, R., Reyburn, H. (2005). Attitudes to voluntary counselling and testing prior to the offer of Nevirapine to prevent transmission of HIV in northern Tanzania. *AIDS Care*, 17(7), 842-852.

Uys, L.R. (2000). Confidentiality and HIV/AIDS in South Africa. *Nursing Ethics*, 7, 158-166.

Van de Perre, P. (2000). HIV voluntary counselling and testing in community health services. *Lancet*, 356, 86-86.

Van Dyk, A.C., Van Dyk, P.J. (2003). To know or not to know: service-related barriers to voluntary counselling and testing (VCT) in South Africa. *Curantis*, 26, 4-10.

Van Dyk, A.C., Van Dyk, P.J. (2004). What is the point of knowing?: Psychological barriers to HIV/AIDS voluntary counseling and testing programmes in South Africa. *Curantis*, 29, 14-19.

Van Rensburg, H.C., Harrison, D. (1995). History of health policy. In: *South African Health Review 1995*. Durban: Health Systems Trust.

Van Rensburg, D., Van Rensburg, N. (1999). Distribution of humanresources. In: *South African Health Review 1999*. Durban: Health Systems Trust.

Van Wyk, D. (2007). *Working with HIV/AIDS*. Cape Town: Juta.

Van Wyk, J.M., Naidoo, S.S., Esterhuizen, T.M. (2010). Will graduating medical students prefer to practice in rural communities. *SA Fam Pract*, 52(2), 149-153.

Vermund, S.H., Wilson, C.M. (2002). Barriers in HIV testing: where next? *Lancet*, 360, 1186-1187.

Weintraub, J.A. (1998). Uses of oral health related quality of life measures in public health. *Community Dent Health*, 15, 8-12.

Westaway, M.S., Viljoen, E., Rudolph, M.J. (1999). Utilisation of oral health services, oral health needs and oral health status in a peri-urban informal settlement. *S Afr Dent J*, 54, 149-152.

White, R. (2000). Nurse assessment of oral health: a review of practice and education. *Br J Nurs*, Mar 9-22, 9(5), 260-6.

White, R.G. (2006). *Development, implementation and evaluation of a curriculum for teaching relational communication skills in dentistry*. Unpublished Ph.D. thesis. University of Pretoria: Pretoria, South Africa.

Whiteside, A. (2008). *HIV/AIDS – A very short introduction*. London: Oxford University Press.

WHO, UNAIDS and UNICEF. Towards universal access: scaling up priority HIV/AIDS interventions in the health sector. Progress report, June 2009. Geneva, World Health Organization, 2009 (<http://www.who.int/hiv/pub/2008progressreport/en/index.html>, accessed 01/09/2010).

Wight, R.G. (2001). Precursive depression amongst HIV infected AIDS caregivers over time. *Social science and medicine*, 51(204), 759-770.

World Health Organisation. (1948). Constitution, Geneva: World Health Organisation. Available at <http://www.definitionofwellness.com/dictionary/health.html>. Last accessed 20/06/2011.

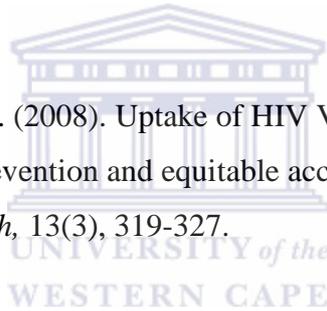
World Health Organization. (2004). World health report 2004. Geneva: World Health Organization, Available at [www.who.org](http://www.who.org). Last accessed 22/07/2010.

World Health Organization. (2010). 2010 Country Progress Report, South Africa. Available at [www.who.org/country\\_Report/South\\_Africa.html](http://www.who.org/country_Report/South_Africa.html). Last accessed 22 February 2011.

World Health Organization, United Nations Children's Fund. Declaration of Alma Ata. International Conference on Primary Health Care: Alma Ata, USSR. 1978 Sept 6-12.

Wright, L.K., Clipp, E.C., George, L.K. (1993). Health consequences of caregiver stress. Medicine, Exercise. *Nutrition and Health*, 2, 181-195.

Wringe, A., Isingo, R., Urassa, M. (2008). Uptake of HIV VCT services in rural Tanzania: implications for effective HIV prevention and equitable access to treatment. *Tropical Medicine and International Health*, 13(3), 319-327.



Yengopal, V., Naidoo, S. (2008). Do oral lesions associated with HIV affect quality of life? *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, 106(1), 66-73.

Young, B.C., Murray, C.A., Thomson, J. (2008). Care home staff knowledge of oral care compared to best practice: a West of Scotland pilot study. *Br Dent J*, 205(8).

Zungu-Dirwari, N., Shisana, O., Udjo E., Mosala, N., Seager, J. (ed). (2004) *Audit of HIV/AIDS Policies in Botswana, Lesotho, Mozambique, South Africa, Swaziland and Zimbabwe*. Cape Town: HSRC Publishers.

**APPENDIX I: Informed consent form**

I am a Masters student from the Department of Community Oral Health at the University of the Western Cape. In South Africa larger numbers of patients are being primarily examined and assessed, diagnosed and treated by Primary Health Care (PHC) Nurses who either assume complete control of the treatment of the patient or refer the patient to medical practitioners and/or other health care workers. As the PHC Nurse is often the patients first point of contact with the medical system PHC Nurses can play a vital role in the early diagnosis of HIV pre-indicative oral lesions and later in the early treatment of the oral manifestations of HIV/AIDS. I would like to study the assessment practices, oral health knowledge and treatment patterns of the PHC Nurse with especial reference to the pre-indicative HIV lesions and the oral manifestations of HIV/AIDS, so that recommendations with regards to training of nurses in oral health assessment and oral health promotion could be made, if required.

I will first administer a short test by showing you a series of photographs and asking you to identify the oral health conditions that you see. A short questionnaire will then be filled in by you. Thereafter you will be given a short lecture on these conditions and a second post-education test will be conducted. You will also be given a series of posters and a booklet outlining a few of the common oral manifestations of HIV/AIDS, to be used as a reference for later use.

The process will take about 10-15 minutes. There are no risks in participating. All information gathered in the study will be treated as strictly confidential. No one will have access to this information except the researcher. Neither your name nor anything that identifies you will be used in any reports of this study. All information collected will be maintained and stored in such a way so as to keep it as confidential as possible. Your participation is voluntary and you may withdraw from the study at any time without any penalties.

If you would like to take part in the study, please sign the bottom of this letter. If you would like to know anything more about the study, please contact Mr. Tufayl Ahmed Muslim on telephone 031-373 5287 (work), mobile 074 1795 132 or via e-mail at dentaltherapist@hotmail.com.

Thank you for your co-operation.

Yours sincerely

Mr Tufayl Ahmed Muslim

-----  
**I understand what will be required of me to take part in the study. I agree to participate in the research being undertaken by Mr. Tufayl Ahmed Muslim I understand that at any time I may withdraw from this study without giving a reason.**

**Name:**.....

**(Print in block letters)**

**(Signature)**

**Telephone Number:** .....

**(Witness)**

**Date:** .....

**Appendix II: Questionnaire for PHC Nurses**

Please tick the appropriate box in response to your answer.

**1. Personal and Educational Information**

- 1.1 Gender  Male  Female
- 1.2 Age (at last birthday)  18-24  25-29  30-39  40-49  50+
- 1.3 Years of Experience as a NURSE  0-2  3-5  6-10  11-20  +20
- 1.4 Has this service been:  continuous or  interrupted.
- 1.5 If interrupted please state for how long? .....Years.....months
- 1.6 Years of Experience as a PHC NURSE  0-2  3-5  6-10  10-19  +20
- 1.7 Has this service been:  continuous or  interrupted.
- 1.8 If interrupted please state for how long? .....Years.....months
- 1.9 Primary Qualification  ENA  EN  DIPLOMA  DEGREE  
 Other (please explain).....  
.....
- 1.10. When did you receive your primary qualification? (year) .....
- 1.11. Do you possess a post-graduate Primary Health Care qualification?  Yes  No
- If **yes**, go to Question 1.12  
If **no**, go to Question 1.16
- 1.12 Name your Primary Health Care Qualification  
.....  
.....
- 1.13 What was the duration of study for your Primary Health Care qualification.....years
- 1.14 When did you receive your PHC qualification? .....(year)
- 1.15 Did you attend any post-graduation Primary Health Care training e.g. short courses, lectures etc.?  yes  no

1.16 If yes please elaborate (course details, duration etc.)

.....

.....

.....

1.17 Have you received any training (undergraduate) in the examination, diagnosis and treatment of oral conditions in general?

- Yes, a basic overview
- Yes, in-depth training
- No

1.18 If you have received post-graduate PHC training, have you received any training in the examination, diagnosis and treatment of oral conditions in general?

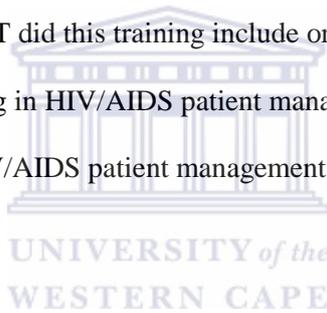
- Yes, a basic overview
- Yes, in-depth training
- No

1.19 Have you received any training in VCT?  yes  no

1.20 If you received training in VCT did this training include oral health treatment?  yes  no

1.21 Have you received any training in HIV/AIDS patient management?  yes  no

1.22 If you received training in HIV/AIDS patient management did this training include oral health treatment?  yes  no



**1. Patient Management**

2.1 Do you routinely examine patients' mouths?  yes  no

**If you answered YES go to Q2.2 to Q2.7  
If you answered NO go to Q2.8**

2.2 Are you comfortable with your oral cavity examination skills?  yes  no

2.3 Do you feel that you may benefit from additional training in the examination and diagnosis of oral conditions?  yes  no

2.4 Do you treat these oral conditions yourself, or do you routinely refer these patients to a dental practitioner?  treat  refer  refer only if beyond my scope of practice

2.5 Are you aware that certain oral conditions e.g oral candida, hairy leukoplakia etc. are pre-indicative of HIV?  yes  no

2.6 Are you aware that certain oral conditions are common oral manifestations of HIV/AIDS e.g. Kaposi's sarcoma, ANUG?  yes  no

2.7 Do you routinely refer patients with these pre-indicative conditions for VCT?  yes  no

**Answer Q2.8 to Q2.14 only if you have answered no to Q2.1**

2.8 Why do you not routinely examine the oral cavity?

- I am not trained in assessment of the oral cavity.
- It is not my task to do so, it is the task of the dental practitioner.
- I only examine and treat the signs and symptoms of the patient.
- examining the oral cavity is not part of the routine patient screening process
- other (please elaborate) .....

.....  
2.9 Are you comfortable with your oral cavity examination skills?  yes  no

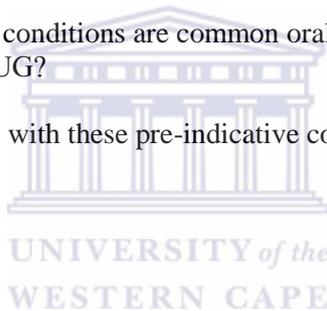
2.10 Do you feel that you may benefit from additional training in the examination and diagnosis of oral conditions?  yes  no

2.11 Do you treat these oral conditions yourself, or do you routinely refer these patients to a dental practitioner?  treat  refer  refer only if beyond my scope of practice

2.12 Are you aware that certain oral conditions e.g. oral candida, hairy leukoplakia are pre-indicative of HIV?  yes  no

2.13 Are you aware that certain oral conditions are common oral manifestations of HIV/AIDS e.g. Kaposi's sarcoma, ANUG?  yes  no

2.14 Do you routinely refer patients with these pre-indicative conditions for VCT?  yes  no



**To be answered by all**

2.15. Do you offer oral health education to your patients?

- Yes
- No
- only at the patients request
- only if the patient requires it ( e.g. patient has smelly breath)

2.16 Do you consider oral health promotion important in your role as a PHC nurse? yes  no

2.17 Do you consider oral health promotion important in the holistic treatment of a patient? yes  no

2.18 Do you consider oral health promotion to be the task of solely the dental practitioners (dentist, dental therapist, oral hygienist)?  yes  no

2.19 Do you refer patients for general dental check-ups, as a matter of routine?  yes  no

2.20 Is there a dental practitioner (dentist, dental therapist, oral hygienist) within your primary healthcare facility?  yes  no

ANY COMMENTS?

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Thank you for your time. It is much appreciated.



## **APPENDIX III - PRE and POST-EDUCATION TEST**

**TEST FOR PRIMARY HEALTH CARE NURSES IN THE UMGUNGUNDLOVU DISTRICT**

**REGARDING**

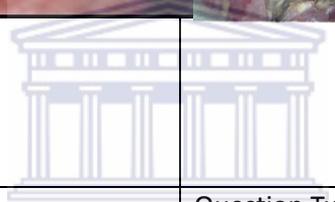
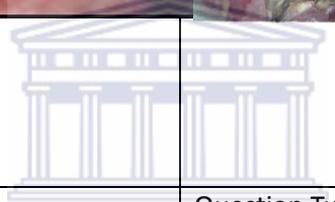
**ORAL MANIFESTATIONS OF HIV/AIDS**



***INSTRUCTIONS:-***

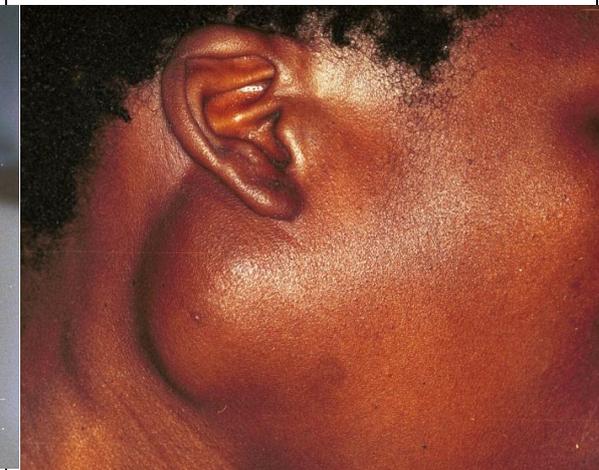
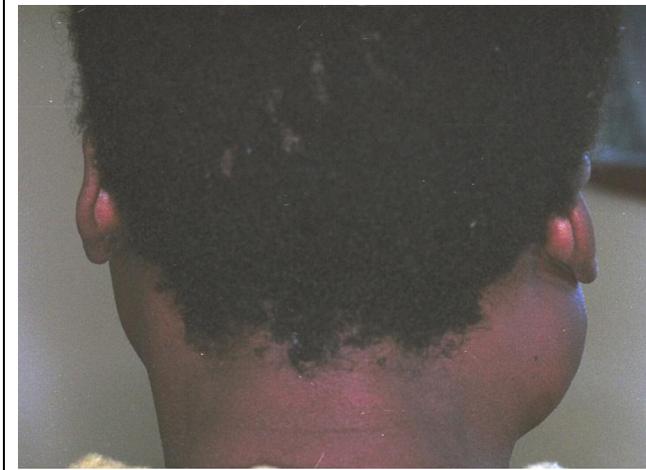
Please identify the 10 oral conditions shown in the pictures below by writing down your answer in the answer sheet provided.

***Thank you for your co-operation.***

Question One	Question One
	
	
Question Two	Question Two
	

Question Three

Question Three



Question Four

Question Four



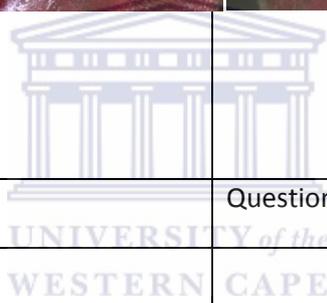
Question Five

Question Five



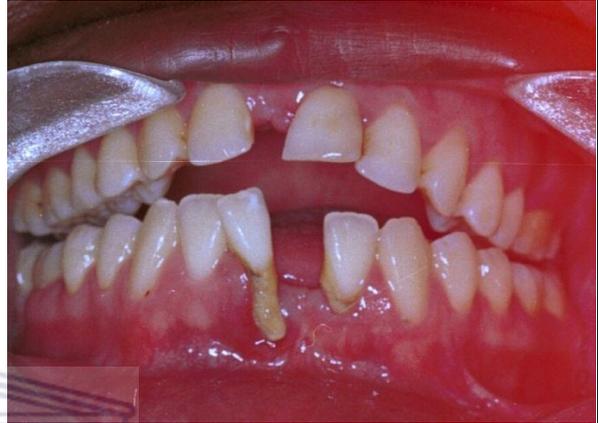
Question Six

Question Six



Question Seven

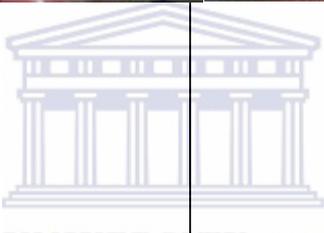
Question Seven



Question Eight

Question Eight



Question Nine	Question Nine
	
	
Question Ten	Question Ten
	

The End

## **Appendix IV**

### SUGGESTED ANSWERS TO QUESTIONNAIRE

1. Candidiasis
2. Angular cheilitis
3. Oral ulcerations
4. Parotid enlargements
5. Molluscum contagiosum
6. Oral hairy leukoplakia
7. Herpes Virus infection
8. Periodontal diseases
9. Kaposi's Sarcoma
10. Dental caries



**Appendix V – Research Ethical Approval**

**OFFICE OF THE DEAN  
DEPARTMENT OF RESEARCH  
DEVELOPMENT**

Private Bag X17, Bellville 7535  
South Africa  
Telegraph: UNIBELL  
Telephone: +27 21 959-2948/2949  
Fax: +27 21 959-3170  
Website: www.uwc.ac.za

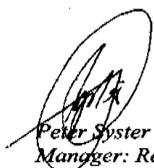
14 September 2010

**To Whom It May Concern**

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and the ethics of the following research project by:  
Dr TA Muslim (Dentistry)

Research Project: Oral HIV knowledge and management among primary health care nurses in the Umgungundlovu Health District, Kwazulu-Natal

Registration no: 10/4/5



*Peter Syster*  
Manager: Research Development Office  
University of the Western Cape



**UNIVERSITY of the  
WESTERN CAPE**

A place of quality, a place to grow, from hope to action through knowledge

## Appendix VI – Dept. of Health Research Approval



**HEALTH**  
KwaZulu-Natal

**Health Research & Knowledge Management sub-component**  
10 – 103 Natalia Building, 330 Langalibalele Street  
Private Bag x9051  
Pietermaritzburg, 3200  
Tel.: 033 – 3953189  
Fax.: 033 – 394 3782  
Email.: [hrkm@kznhealth.gov.za](mailto:hrkm@kznhealth.gov.za)  
[www.kznhealth.gov.za](http://www.kznhealth.gov.za)

**Reference: HRKM082/10**  
**Enquiries: Mr X Xaba**  
**Telephone : 033 – 395 2805**

Dear Mr TA. Muslim

### Subject: Approval of a Research Proposal

1. The research proposal titled '**Oral HIV knowledge and Practices among Primary Health Care (PHC) Nurses in the uMgungundlovu Health District, KwaZulu Natal**' was reviewed by the KwaZulu-Natal Department of Health. The proposal is hereby **approved** for research to be undertaken at Edendale and Grey's Nursing Colleges.

**Research at the health facilities listed below can only be conducted when this office receives a letter of support from the uMgungundlovu District Manager:**

Edendale, Greys and Northdale Hospitals  
Bruntonville, Imbalenhle and Richmond Community Health Centres  
East Street, Howick, Eastwood Clinic, Oribi, Mpophomeni and Gateway Clinics.

2. You are requested to take note of the following:
  - a. Make the necessary arrangement with the identified Managers before commencing with your research project.
  - b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.
3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to [hrkm@kznhealth.gov.za](mailto:hrkm@kznhealth.gov.za)

For any additional information please contact Mr X. Xaba on 033-395 2805.

Yours Sincerely

**Dr S.S.S. Buthelezi**

Date: 10/08/2010

**Chairperson, Health Research Committee**

**KwaZulu-Natal Department of Health**

---

uMnyango Wezempilo . Departement van Gesondheid

*Fighting Disease, Fighting Poverty, Giving Hope*

## Appendix VII – Dept. of Health – Nursing College Research Approval



**KWAZULU- NATAL COLLEGE OF NURSING**  
P/Bag X9089, Pietermaritzburg, 3200  
Tel.: (033) 264 7800, Fax: (033) 394 7238  
e-mail: lulama.mthembu@kznhealth.gov.za  
www.kznhealth.gov.za

Enquiries: Mrs. S. Maharaj  
Telephone: 033 – 264 7806  
Date: 23 July 2010

Principal Investigator:  
Mr. TA Muslim  
Faculty of Dentistry  
University of the Western Cape

Dear Sir

RE: PERMISSION TO CONDUCT RESEARCH AT KZN CAMPUSES

I have pleasure in informing you that permission has been granted to you by the Principal of the KwaZulu-Natal College of Nursing to conduct research on:

***“Oral HIV Knowledge And Practices Among Primary Health Care Nurses in the UMGungundlovu Health Districts, KwaZulu-Natal”***

At the following Campuses:  
Greys Campus  
Edendale Campus

Please note the following:

- 1) Please ensure that you adhere to all policies, procedures, protocols and guidelines of the Department of Health with regards to this research.
- 2) This Research will only commence once this office has received confirmation from the Provincial Health Research Committee in the KZN Department of Health.
- 3) Please ensure this office is informed before you commence your research.
- 4) The KwaZulu-Natal College (King Edward VIII Campus) will not provide any resources for this research.
- 5) You will be expected to provide feedback on your findings to the Principal of the KwaZulu-Natal College of Nursing.

Thanking You.  
Sincerely

Dr. LL. Nkonzo-Mtembu  
Principal:KwaZulu-Natal College of Nursing

**APPENDIX VIII – Permission of District Manager – uMgungundlovu District**



**UMGUNGUNDLOVU HEALTH DISTRICT  
OFFICE OF THE DISTRICT MANAGER**  
262 Longmarket Street, Pietermaritzburg, 3201  
Private Bag X9124, Pietermaritzburg, 3200  
2<sup>ND</sup> Floor, Brasfort House,  
Email: thule.kunene@kznhealth.gov.za  
Tel.: 033 897 1000 Fax: 033 897 1078

**Enquiries: Mrs. N.M. Zuma – Mkhonza  
Ref No: 16/17/ DEN/UMG/2010  
Date: 16 September 2010**

**TO: Mr Tufayl Ahmed Muslim  
Programme Co-ordinator – Dental Assisting Programme  
Department of Dental Sciences  
M L Sultan Campus  
Berea  
Durban**

**RE: PERMISSION TO CONDUCT RESEARCH AT THE DISTRICT :**

I have a pleasure in informing you that permission has been granted to you by the District Office to conduct research on **ORAL HIV KNOWLEDGE AND PRACTICES AMONG PRIMARY HEALTH CARE (PHC) NURSES IN THE UMGUNGUNDLOVU HEALTH DISTRICT , KWA-ZULU NATAL**

**PLEASE NOTE THE FOLLOWING**

1. Please ensure that you adhere to all the policies, procedures, protocols and guidelines of the Department of Health with regards to this research.
2. This research will only commence once this office has received confirmation from the Provincial Health Research Committee in the KZN Department.
3. Please ensure this office is informed before you commence your research.
4. The District Office will not provide any resources for this research.
5. You will be expected to provide feedback on your findings to the District Office.

**THANK YOU  
MRS NM ZUMA-MKHONZA  
DISTRICT MANAGER  
UMGUNGUNDLOVU HEALTH DISTRICT**

uMnyango Wezempilo . Departement van Gesondheid

*Fighting Disease, Fighting Poverty, Giving Hope*

**Appendix IX – Permission to contact study from the uMgungundlovu Municipality**

*The Msunduzi Municipality*  
COMMUNITY SERVICES AND SOCIAL EQUITY  
HEALTH AND SOCIAL SERVICES  
333 Church Street, Pietermaritzburg, 3201  
☒ P O Box 89, Pietermaritzburg, 3200  
Telephone: (033) 3922325  
Fax: (033) 3922505  
E-mail: [lorraine.chetty@msunduzi.gov.za](mailto:lorraine.chetty@msunduzi.gov.za)  
082 300 82 68



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ENQ : Sr. L Chetty      TEL: 033 3922325      FAX : 033-3922505      REF :100/3

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30<sup>th</sup> June 2010

Dear Mr T A Muslim

**RE: PERMISSION TO UNDERTAKE RESEARCH AMONGST CLINIC SISTERS**

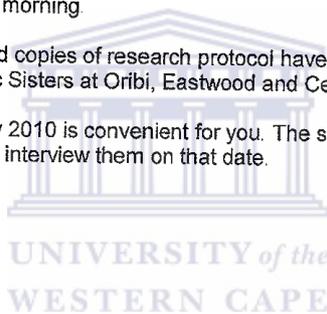
Thank you for meeting with us this morning

As evidence of ethical approval and copies of research protocol have been received, you are hereby given permission to interview Clinic Sisters at Oribi, Eastwood and Central City Clinics.

You have indicated that the 5<sup>th</sup> July 2010 is convenient for you. The staff in the above mentioned clinics will be informed that you will interview them on that date.

Kind regards

**DR N NKOSI  
PROCESS MANAGER  
HEALTH AND SOCIAL SERVICES.**



**Appendix X – Data Analysis (Pre- and Post-Test Analysis)**

## Pre- and Post-Test Results of Comparison

**Table A. Analysis Of Variance Pre-and Post results**

Source	Chi- DF	Square	Pr > ChiSq
TypeOfLesion	9	265.98	<.0001
Pre_Post	1	155.33	<.0001
TypeOfLesio*Pre Post	9	15.03	0.0901



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**Table B. Contrast/Comparison between Pre-Post Results for each Lesion**

Label	Standard Estimate	Error	Alpha	Chi- Confidence	Limits	Square	Pr > ChiSq
Angular Cheilitis	1.3454	0.2865	0.05	0.7839	1.9069	22.06	<.0001
Aphtous Ulcers	0.8395	0.2630	0.05	0.3241	1.3549	10.19	0.0014
Dental Caries	0.5100	0.2623	0.05	-0.0040	1.0241	3.78	0.0518
Herpes Simplex	0.8475	0.2644	0.05	0.3293	1.3657	10.27	0.0013
Kaposi Sarcoma	1.2001	0.3073	0.05	0.5978	1.8024	15.25	<.0001
Molluscum Contagi	1.7714	0.2841	0.05	1.2146	2.3282	38.88	<.0001
Oral Candidiasis	1.1776	0.3565	0.05	0.4789	1.8764	10.91	0.0010
Oral Hairly	1.0938	0.2682	0.05	0.5682	1.6194	16.64	<.0001
Parotid	0.9213	0.2661	0.05	0.3998	1.4428	11.99	0.0005
Periodon	1.4383	0.3418	0.05	0.7683	2.1082	17.70	<.0001

Reference: The Analysis was ran by Dr. Louis Munyakazi School Devel Studies UKZN