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Voluntary Counselling and Testing for HIV in the dental clinical setting: Knowledge, attitudes, perceptions and practices of oral health care workers in the eThekweni District, Durban, South Africa.

A dissertation submitted in fulfilment of the requirements for the degree Master of Medical Science (Dentistry) in the School of Health Sciences, University of KwaZulu-Natal.

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Voluntary Counselling and Testing for HIV in the dental clinical setting: Knowledge, attitudes, perceptions and practices of oral health care workers in the eThekweni District, Durban, South Africa.

S. Balwanth

Dissertation

A dissertation submitted to the Discipline of Dentistry, School of Health Sciences, University of KwaZulu-Natal, Westville, for the degree of Master of Medical Science (Dentistry) in the School of Health Sciences.

This dissertation is presented in manuscript format and comprises five chapters including the Introduction, Literature Review, Methodology and the Conclusion and Recommendations.

This is to certify that the contents of this dissertation is the original research work of Dr Sonam Balwanth, carried out under the supervision of Prof Shenuka Singh, Discipline of Dentistry, School of Health Sciences, Westville Campus, University of KwaZulu-Natal, Durban, South Africa.

As the candidate's supervisor, I have approved this dissertation for submission for examination.



SUPERVISOR: Prof Shenuka Singh



STUDENT: Dr Sonam Balwanth

DATE: 23 July 2018

DECLARATION

I, Sonam Balwanth, declare that:

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MANUSCRIPT ARISING FROM THIS STUDY FOR PUBLICATION

One manuscript emanated from this study, namely:

Voluntary Counselling and Testing for HIV in the dental clinical setting: Knowledge, attitudes, perceptions and practices of oral health care workers in the eThekweni District, Durban, South Africa.

Authors: Sonam Balwanth and Shenuka Singh

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ABSTRACT

Introduction

In South Africa, the prevalence of the Human immunodeficiency virus and Acquired immunodeficiency syndrome (HIV/AIDS) is an estimated 12.6% (Statistics South Africa, 2017). The province KwaZulu-Natal has the highest prevalence of HIV, contributing to 40% of the total number of the HIV infected people in South Africa (Shisana *et al.*, 2014). Therefore, the prevention of HIV remains an important goal for the eThekweni Department of Health (National Department of Health of South Africa, 2015). HIV testing is considered to be an essential component in reducing the impact of the disease (National Department of Health of South Africa, 2015) and provides an opportunity to oral health care workers to offer early HIV detection, and referral for further care and treatment for those who are infected (Campo *et al.*, 2012). The oral health care worker is at the forefront of recognising the oral manifestations of HIV, promoting rapid HIV testing, and curbing the detrimental effects of the disease (Glick, 2005; Campo *et al.*, 2012). Rapid HIV testing has not yet been implemented to the dental workplace in South Africa, thus creating a gap in Voluntary Counselling and Testing (VCT) for HIV. It is widely accepted internationally that the knowledge, attitudes and practices of health practitioners can have a significant impact on the diagnosis and management of the disease (Glick, 2005; Hanssens, 2007). In South Africa, there is a paucity of published evidence that describes the knowledge, attitudes and practices of oral health care workers' regarding Voluntary Counselling and Testing for HIV in both the public and private dental sector.

Aim and objectives

The aim and objectives of this study was to assess oral health care workers' knowledge, attitudes, perceptions and practices in Voluntary Counselling and rapid HIV testing in the dental clinical environment, so as to ascertain their acceptance and support for a proposed implementation of these services in the eThekweni district, KwaZulu-Natal.

Methods and materials

This was a cross-sectional, descriptive and exploratory study that assessed the knowledge, attitudes, perceptions and practices of oral health care workers with respect to VCT for HIV. One hundred completed questionnaires were collected from voluntary participants (n=100), yielding a 100% response rate. The study sites included 8 public oral health institutions in eThekweni District, which comprised hospitals (n=5) and clinics (n=3), and private dental practices (n=60). The total study population consisted of purposively selected dental surgeons (69%; n=69), dental therapists (n=22; 22%), oral hygienists (n=7; 7%) and dental specialists (n=2; 2%) in the eThekweni District. Overall, 45 oral health care workers (45%) from the public oral health sector and 55 participants from private dental practices (55%) participated in the study.

The first research instrument comprised a self-administered questionnaire, with 22 items designed to assess oral health care workers' biographical information, HIV knowledge, attitudes and practices of HIV testing. The first part of the questionnaire focused on information such as gender, age group, profession, place of work, work experience and number of patients managed on a weekly basis. The second part of the questionnaire included questions pertaining to knowledge and practices with respect to HIV testing training, referral of patients with HIV associated oral lesions, commonly observed HIV oral manifestations, HIV testing at the dental workplace and knowledge of HIV testing. The third part of the questionnaire included questions related to the attitudes and perceptions of oral health care workers' regarding HIV screening in the dental workplace in the form of a Likert scale with the format of responses: 1-strongly agree, 2-agree, 3-not sure, 4-disagree and 5-strongly disagree to elicit respondents' perceptions related to funding, resources, HIV testing, training and implementation of HIV testing in the dental workplace. The questionnaire consisted of closed-ended and open-ended questions. The study was granted ethical clearance by the Biomedical Research Ethics Committee at the University of KwaZulu-Natal (BREC REF: BE400/17). A pilot study was conducted among five (5%) oral health care workers to test and refine the research instrument before conducting the main study. These participants were not included in the main study.

Data was analysed using SPSS version 24.0 (IBM Corp., USA). Univariate descriptive statistics, such as frequency and mean distribution, were conducted for all variables. The responses to the open-ended questions were grouped and emergent themes were examined and compared for possible associations. Inferential techniques included Pearson's χ^2 test to assess a possible relationship between the independent variables (gender, age group, profession of the oral health care worker, place of work, years of work experience and number of patients seen on weekly basis) and the dependent variables (choice to implement rapid HIV testing in the dental workplace). A p-value < 0.05 was considered to be statistically significant.

A semi-structured face-to-face interview was conducted with the Chief Director of the eThekweni Department of Health. The interview schedule included 8 questions designed to obtain information regarding existing HIV prevention and promotion strategies, opportunistic HIV testing at the dental workplace, policy change for VCT inclusion in the dental workplace, funding, opportunities and barriers to implementing VCT in the dental workplace, HIV counselling, testing and training at undergraduate level and refresher courses for existing oral health care workers. The qualitative data was audio recorded and analysed using thematic analysis as described by Braun and Clarke (2006).

Results

The majority of participants were dental surgeons (n=69; 69%). Almost a third of the participants (n=31, 31%) were within the age distribution of 41 > years old whilst more than fifty percent of participants were male (n=54; 54%). More than half of the participants reported to work at private dental practices (n=57; 57.0%). Almost 37% (n=37) of participants incorrectly indicated that HIV testing cannot be performed by obtaining saliva samples from patients. Thirty percent (n=30) of participants were "unsure" as to whether HIV could be tested using urine samples from patients. An alarming 54% (n=54) of participants reported to be "unsure" of other methods of HIV testing. The majority of the participants (n=89; 89%) reported to have heard of rapid HIV testing. However, some participants (n=41; 41%) were "unsure" as to whether rapid HIV testing was as accurate as the ELISA and Western blot testing methods. Eighty-two of participants (82%) did not test for HIV in the dental workplace and nearly all participants (n=98; 98%) reported to have

referred patients with suspected HIV related oral lesions for further confirmatory tests. Participants reported that Oral candidiasis (n=62; 63.3%), Necrotising Ulcerative Periodontitis (n=56; 57.1%) and Necrotising Ulcerative Gingivitis (n=50; 51.0%) were the most commonly observed HIV oral manifestation in patients presenting at their dental workplace. The majority of the participants (n=83; 83.0%) indicated they did not undergo training in HIV counselling and testing. Almost all participants (n= 94; 94.0%) supported the idea that oral health care workers should be trained at undergraduate level and many participants (n=82; 82%) indicated willingness to enrol for training in HIV counselling and testing. The majority of participants (n=87; 87%) reported that routine HIV testing in the dental workplace was a good idea. Participants (n=66; 66.0%) reported willingness to implement HIV testing in their dental workplace and 80% (n=80) of participants reported that HIV testing was within the scope of dentistry. Many participants (n=83; 83%) reported that HIV testing in the dental workplace could improve HIV awareness. Interestingly, it was reported that more oral health care workers from the private dental practice (n=26; 45.6%) were against the implementation of HIV testing at the dental workplace when compared to other dental places of work.

With regards to the results from the semi-structured interview with the Chief Director of the eThekweni Department of Health, the following themes emerged: strategies for HIV testing within the Department of Health; HIV testing and the feasibility of such services in the dental workplace; and HIV related training and funding.

Discussion

Only 18% of participants reported to have performed rapid HIV testing in their dental workplace, despite the high prevalence of HIV oral manifestations observed in patients. These findings are similar to a study by Gumede (2017) where the author explored knowledge, attitudes and perceptions of health care users towards rapid HIV testing at selected gateway clinics in eThekweni. That study indicated that the majority of participants had heard of rapid HIV testing, yet only a few participants reported to have used rapid HIV testing (Gumede, 2017).

Participants recognised their limitations in HIV testing skills and almost all participants (94%) advocated for HIV counselling and testing training to be included in undergraduate curricula. This finding is similar to a study conducted by Ramphoma and Naidoo, (2014) which investigated the knowledge, attitudes and practices of oral health care workers in Lesotho regarding the management of patients with oral manifestations of HIV/AIDS. Ramphoma and Naidoo, (2014) found that very few dentists reported to have comprehensive knowledge of oral HIV lesions and nearly all participants expressed the need for further knowledge and training in this regard. Participants in this study reported oral candidiasis as the most common oral HIV lesion observed in their patients, which is similar to several other studies (Darling, Arendorf and Samaranayake, 1992; WHO Collaborating Centre on Oral Manifestations of the Immunodeficiency Virus, 1993; Rudolph and Ogunbodede, 1999; Ramphoma and Naidoo, 2014).

The majority of participants (66.0%) reported to be willing to implement HIV testing in their dental workplace. This finding is well worth noting, as it creates an opportunity for all oral health care workers in eThekweni to be recognised as key players in the early diagnosis of HIV (Austin, 2009; Campo *et al.*, 2012) and in turn improve the health system in South Africa. The reported positive attitudes and optimism expressed among oral health care workers regarding HIV testing in the dental workplace, are similar to those cited in previous studies (Zungu and Sanni, 2011; Abe, Kolude and Adeyemi, 2014; Santella *et al.*, 2015). However, barriers to HIV testing in the dental workplace have been identified. These include: lack of HIV counselling and testing training among oral health care workers and staff, lack of remuneration, lack of guidance from the Department of Health, compromised patient confidentiality, liability for false results and a lack of resources and time. Some participants (n=26; 45.6%) from the private dental practices in eThekweni, indicated to be against HIV testing in the dental workplace when compared to other oral health care workers' place of work. Similarly, international studies have reported that oral health care workers from the private dental sector were less likely to implement HIV testing to the dental workplace (Patton *et al.*, 2002; Greenberg *et al.*, 2010).

The results of the semi-structured interview indicates that HIV testing is very feasible in the dental workplace. Despite concerns regarding data collection and poor coordination; it emerged that effective partnership with the Department of Health can help address the challenges of data

management. It was found that in the private dental practice, the number of rapid HIV tests distributed and the number of tests utilised, posed a problem with regards to record keeping, data collection and submission to the Department of Health. Additionally, it emerged that coordination of proper referral linkages of patients is imperative so as to not lose any patients in the system. These are important concerns as it aids in identifying the needs of the people and assists in effective health planning. A study by Hutchinson *et al.*, (2012), investigated the feasibility of implementing rapid oral fluid HIV testing in an Urban University dental clinic and results were fairly consistent with this study.

Conclusion

The results of this study indicated that oral health care workers' HIV testing knowledge and practice of HIV testing is inadequate. However, oral health care workers have recognised their limitations with regards to lack of HIV testing knowledge and skills and thus have advocated for HIV counselling and testing training, particularly at undergraduate level. Oral health care workers expressed positive attitudes and willingness to implement HIV testing to the dental workplace, provided an HIV testing policy specific to the dental sector is implemented and guided by the Department of Health.

Despite positive feedback from the eThekweni Department of Health regarding HIV counselling and testing in the dental workplace, explicit oral health planning in the eThekweni district is required to take into account the pre-existing attitudes and HIV testing practices of oral health care workers and provide greater support for oral health care workers. This could include training in HIV counselling and testing at undergraduate level, continuing professional development (CPD) for existing oral health care workers and guidelines for HIV testing in the dental workplace.

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
CDC	Centres for Disease Control and Prevention
CHC	Community Health Center
CICT	Community Initiated HIV Counselling and Testing
DOH	Department of Health
ELISA	Enzyme-linked Immunosorbent assay
FDA	Food and Drug Administration
HAART	Highly active antiretroviral treatment
HIV	Human Immunodeficiency Virus
HTS	HIV Testing Services
KZN	KwaZulu-Natal
NDOH	National Department of Health
NUG	Necrotizing Ulcerative Gingivitis
NUP	Necrotizing Ulcerative Periodontitis
PICT	Provider Initiated HIV Counselling and Testing
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNICEF	United Nations International Children's Emergency Fund
VCT	Voluntary Counselling and Testing
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

1.1 Introduction

HIV/AIDS has become a critical public health issue that has affected millions of people globally (Ebot, 2009). According to The Gap Report (2014), at the end of 2013, 35 million people were living with HIV (UNAIDS, 2014, p. 9, 17), 3.2 million children younger than 15 years old had the virus and 1.5 million AIDS related deaths were recorded (UNAIDS, 2014, p. 9, 17). The majority of infected individuals predominantly reside in economically low and middle class countries, of which 24.7 million live in sub-Saharan Africa (UNAIDS, 2014, p.26). The number of infected individuals in sub-Saharan Africa has contributed to 71% of the total global percentage of HIV prevalence (UNAIDS, 2014, p.26). Furthermore, a significantly high percentage (80%) of women aged 15 years and older in sub-Saharan Africa, reported to be living with HIV (UNAIDS, 2014, p. 18). HIV/AIDS has imprinted heavily on South Africa. In 2016, approximately 7 million South Africans were infected with HIV (UNAIDS, 2017b) and 110,000 HIV/AIDS related deaths were recorded (UNAIDS, 2017b). Among the most vulnerable to the infection, are young women and adolescent girls (UNAIDS, 2013). It was found that South African women face a higher risk of contracting the HIV infection compared to men (UNAIDS, 2017b), with the greatest difference being in the age group 15-24 years, where young women were three times more likely to contract the disease than their male counterparts (UNAIDS, 2017b). In South Africa, the prevalence of HIV among adolescent girls aged 15–19 years was reported to be 5.6% (UNAIDS, 2014, p.34) and escalating to 17.4% for young women aged 20–24 years (UNAIDS, 2014, p.34). According to the South African National HIV Prevalence, Incidence and Behaviour Survey (2012), the province of KwaZulu-Natal is reported to have the highest prevalence of HIV, contributing to 40% of the total number of HIV infected people in South Africa (Shisana *et al.*, 2014, p.28).

HIV/AIDS has no boundaries and affects people of all ages, ethnic groups and socio-economic backgrounds (Ebot, 2009). However, individuals that inject narcotics, prostitutes, transgender individuals, prisoners, and homosexual men, have been identified as key population groups that are more susceptible to contracting HIV (Ebot, 2009; UNAIDS, 2014). Many studies conducted globally have established that young women and adolescent girls are disproportionately vulnerable

to contracting HIV (Shisana *et al.*, 2014; UNAIDS and Kharsany, 2016; UNAIDS, 2017b). The reasons for the high incidence of HIV among this vulnerable group, is that many young individuals feel that they are not at risk of contracting the infection and many do not have sufficient knowledge regarding HIV transmission (UNAIDS, 2014, p.34). Additionally, intimate partner violence has played a role in increasing the chances of young women acquiring HIV (UNAIDS, 2014, p.36). However, chief among reasons for the high prevalence of HIV, is that only 45% of HIV infected individuals know their HIV status (UNAIDS, 2014, p.29). This means that from 35 million HIV infected individuals worldwide, 19 million of these individuals have no knowledge of their HIV status and thus spread the disease unknowingly (UNAIDS, 2014).

The prevalence of HIV is closely correlated with gender inequality and vulnerabilities, socio-economic backgrounds, behavioural patterns and situational factors (Shisana *et al.*, 2014). Many studies have explored and identified barriers to HIV testing, which have been found to contribute to the low HIV testing rate (Lane, 2008; Ebot, 2009; Chonco, 2016; Mohlabane *et al.*, 2016; Weihs and Meyer-Weitz, 2016). These barriers include: lack of knowledge of HIV testing possibilities, lack of access to health care facilities, perception of not being at risk of contracting the HIV infection, and stigma and discrimination associated with HIV/AIDS (Lane, 2008; Ebot, 2009). According to Nakigozi *et al.*, (2013), individuals who do not exhibit signs of illness may not readily test for HIV and thus spread the infection unknowingly. According to Lane (2008), low uptake of VCT among the South African population has been reported, which has created an obstacle to the prompt commencement of antiretroviral treatment and care of the infected individual. Considering South Africa constitutes one of the highest HIV rates in the world (Statista, 2016), the need for HIV testing and counselling is paramount (World Health Organization *et al.*, 2005). Since the outbreak of HIV/AIDS, numerous efforts have been made globally to stop the spread of the disease and reduce the associated morbidity and mortality rates (South African National Aids Council (SANAC), 2016; UNAIDS, 2016, 2017a). Emphasis on the importance of early opportunistic testing for HIV/AIDS is well documented (WHO, 2004; Lane, 2008; Cohen *et al.*, 2010; Dilemia *et al.*, 2010; National Department of Health of South Africa, 2015; Chonco, 2016) and remains an imperative aspect in controlling the spread of the disease in line with the Millennium Development Goals (KwaZulu-Natal Department of Health, 2015; UNAIDS, 2016).

Many authors have cited the incidence of HIV oral lesions worldwide (Glick *et al.*, 1994; Arendorf *et al.*, 1998; Coogan, Greenspan and Challacombe, 2005; Odell and Cawson, 2008; Bhayat, Yengopal and Rudolph, 2010; Krishna, Zemse and Derossi, 2011; Campo *et al.*, 2012). The oral cavity has provided a diagnostic instrument for oral health care workers to ensure early detection, monitoring and evaluation of the progression of the disease, by the observation of specific HIV oral lesions (Coogan, Greenspan and Challacombe, 2005; Campo *et al.*, 2012). According to Campo *et al.*, (2012) oral HIV lesions are a frequent finding among HIV positive patients and are often misdiagnosed or untreated due to delay in HIV testing or no HIV testing at all. Oral health care workers are often first to recognise oral HIV lesions and therefore play a vital role in diagnosis and management of suspected HIV infected patients (Coogan, Greenspan and Challacombe, 2005). According to Odell and Cawson (2008), the frequency of HIV oral manifestations is declining since the introduction of Highly Active Antiretroviral Therapy (HAART), which reiterates the importance of early opportunistic HIV screening to ensure that infected individuals seek prompt medical treatment and thereby improve their prognosis (Campo *et al.*, 2012).

South Africa has been recognised as a developing country with limited resources and infrastructure (Layne, 1997). Thus, an innovative and cost effective method of testing for HIV has been utilised in Provider Initiated Counselling and Testing (PICT) and Client Initiated Counselling and Testing (CICT) throughout the country (Moodley *et al.*, 2008; National Department of Health of South Africa, 2015). The benefits of the rapid HIV testing method in the dental workplace is documented in international studies as making a significant positive impact on patients visiting the dental sector (Glick, 2005; Austin, 2009; Santella, Conway and Watt, 2016). Furthermore, these studies have highlighted the role of oral health care workers as an imperative component in the early HIV recognition and management of HIV infected individuals (Pindborg, 1989; Campo *et al.*, 2012; Bhayat and Chikte, 2017). However, rapid HIV testing has not yet been implemented to the dental workplace in South Africa, thus creating a gap in VCT service delivery.

International studies have explored the knowledge, attitudes, perceptions and practice of oral health care workers regarding VCT at the dental workplace (Campo *et al.*, 2012; Siegel *et al.*, 2012; Abe, Kolude and Adeyemi, 2014; Pollack *et al.*, 2014; Santella, Conway and Watt, 2016; Parish *et al.*, 2017). These studies have demonstrated that many oral health care workers are

optimistic about extending HIV testing to the dental workplace, however, a common limiting and crucial factor has been identified to be a lack of HIV testing training among oral health care workers (Campo *et al.*, 2012; Abe, Kolude and Adeyemi, 2014; Parish *et al.*, 2017). In South Africa, there is a paucity of data exploring the knowledge, attitudes, perceptions and practice of oral health care workers regarding VCT in the dental workplace, thereby highlighting an untapped gateway to explore the opportunities and challenges to implementation.

1.2 Problem Statement

In South Africa, the incidence of the Human immunodeficiency virus and Acquired immunodeficiency syndrome (HIV/AIDS) is approximately 12.6% (Statistics South Africa, 2017). The province of KwaZulu-Natal presents with the highest prevalence of HIV (Shisana *et al.*, 2014), contributing to 40% of the total number of HIV infected people in South Africa (Shisana *et al.*, 2014). This increases the morbidity and mortality rates associated with HIV/AIDS and at the same time increases the rate of transmission (UNAIDS, 2013a:51) as many individuals do not know their HIV status (UNAIDS, 2013a:52). It is estimated that 36% of the Sub-Saharan population, are unaware of their HIV status (UNAIDS, 2013a:51).

The oral health care worker is often first to recognise oral manifestations of HIV (Campo *et al.*, 2012). These oral lesions present in up to 50% of HIV infected individuals (Coogan, Greenspan and Challacombe, 2005) and in up to 80% of individuals with AIDS (Coogan, Greenspan and Challacombe, 2005). Therefore, early opportunistic HIV testing by the oral health care worker is essential in recognition of HIV progression, evaluation and management of HIV infected patients (Glick *et al.*, 1994). However, the dental clinical setting in South Africa, has been omitted as a key entry point in providing VCT to the public, thereby creating a gap in VCT service delivery.

HIV/AIDS is a sensitive topic and thus studies have identified barriers to HIV testing (Lane, 2008; Ebot, 2009; Chonco, 2016). These include: lack of HIV knowledge, lack of access to primary health care facilities and stigma related to HIV/AIDS (Lane, 2008; Chonco, 2016). In eThekweni, there are many health facilities that offer VCT, however, the accessibility is questionable due to the low patient satisfaction rate and low scoring on the “Ideal Clinic Dashboard.” Furthermore,

there are even fewer public dental facilities within eThekweni of which none provide VCT (Dookie, Singh and Myburgh, 2017). Additionally, rapid HIV testing has not yet been implemented to the dental workplace in South Africa, therefore oral health care workers do not have comprehensive knowledge and skills due to lack of personal use of the rapid HIV testing kits. Numerous international studies have explored the knowledge, attitudes, perceptions and practice of oral health care workers regarding HIV testing in the dental workplace (Patton *et al.*, 2002; Glick, 2005; Greenberg *et al.*, 2010; Campo *et al.*, 2012; Abe, Kolude and Adeyemi, 2014; Santella, Conway and Watt, 2016; Parish *et al.*, 2017). In eThekweni, South Africa, there is a lack of published evidence regarding oral health care workers' knowledge, attitudes, perceptions and practice of HIV testing in the public and private dental workplace, which may be vital in improving the health system.

The feasibility and practicality of implementing HIV testing to the dental workplace in eThekweni, are important factors to consider. The lack of funding and resources have been identified by Hutchinson *et al.*, (2012) and Tabb *et al.*, (2017) as implementation barriers to HIV testing. In eThekweni, there is no data exploring the feasibility, knowledge, attitudes, perceptions and practice of oral health care workers regarding HIV testing in the dental workplace. This information is crucial as it could reflect oral health care workers' understanding of the importance of early HIV detection and the critical role they play in improving the oral health system in South Africa. This in turn, may influence oral health planners to develop policies and guidelines for HIV testing in the dental workplace.

1.3 Purpose of the study

Taking into account the high incidence of HIV/AIDS in South Africa, particularly among young women, as well as the low uptake of VCT, bold efforts are required to increase the number of individuals tested for HIV. Therefore, the purpose of this study is to ascertain oral health care workers' knowledge, attitudes, perceptions and practice of VCT at the dental workplace, so as to provide an additional HIV testing service point. To my knowledge this study is the first of its kind to be done in South Africa. This study paves the way to identify the barriers, challenges and opportunities for extending VCT to the public and private dental workplace in eThekweni. More

so, it creates an avenue for eliminating the fear, stigma and discrimination associated with HIV positive individuals and brings about health awareness (Lane, 2008; Chonco, 2016). The information gathered from this study creates an opportunity for oral health planners towards developing a suitable framework in the form of an HIV testing policy for the dental workplace, as a means of reducing the effect of the disease in South Africa and improving the lives of vulnerable individuals.

1.4 Research questions

1. Does the dental workplace in the public and private sectors in the eThekweni District provide a suitable platform for Voluntary Counselling and rapid HIV testing services for dental patients?
2. What opportunities exist for implementing Voluntary Counselling and rapid HIV testing services in the dental workplace in the eThekweni district?
3. What possible barriers exist for the proposed implementation of Voluntary Counselling and rapid HIV testing in the dental workplace in the eThekweni District?

1.5 Aim

The aim of this study was to assess oral health care workers' knowledge, attitudes, perceptions and practices in Voluntary Counselling and rapid HIV Testing in the dental clinical environment, so as to ascertain their acceptance and support for a proposed implementation of these services in the eThekweni district, KwaZulu-Natal.

1.6 Objectives of study

1. To determine oral health care workers' knowledge and practices of Voluntary Counselling and Testing for HIV.

2. To ascertain oral health care workers' attitude towards Voluntary Counselling and Testing for HIV.
3. To determine oral health care workers' perceptions and practices of Voluntary Counselling and Testing for HIV.
4. To determine the practicality and acceptance of implementing a rapid HIV testing programme in the dental workplace by means of a semi-structured interview with the eThekweni Department of Health Chief Director.

1.7 Significance of Study

With KwaZulu-Natal (KZN) presenting with the highest HIV incidence in the country (Chonco, 2016), numerous efforts have been made by the South African National Department of Health to curb the high prevalence of HIV. Some of the efforts made on a national scale include the National Strategic Plan (NSP) on HIV, Sexually transmitted infections (STI) and Tuberculosis (TB) 2012-2016 which was launched in 2011 (National Department of Health of South Africa, 2011) and the 90-90-90 strategy within the National Development Plan launched in 2012 (UNAIDS, 2017a). These strategies emphasize the importance of early opportunistic HIV screening and advocates for the increase of the number of individuals tested for HIV. However, allied health services such as the dental workplace, has not been recognised as primary health care HIV testing sites in South Africa. Additionally, accessibility to conventional primary health care facilities in eThekweni has been identified as a barrier to HIV testing (KwaZulu-Natal Department of Health, 2015). Furthermore, oral lesions are clinical markers for the detection and progression of diseases such as HIV/AIDS (Coogan, Greenspan and Challacombe, 2005). The oral health care worker thus plays a pivotal role in the recognition of oral HIV lesions, early detection of HIV, management and continuum of care of the infected individual (Campo *et al.*, 2012). Thousands of patients visit the dental departments in hospitals and clinics in eThekweni (KwaZulu-Natal Department of Health, 2015) and are often referred by oral health care workers for HIV testing. However, this has resulted in poor return of patients to receive the results or patients not performing the test at all (Vernillo and Caplan, 2007). This in turn, coupled with other contributing factors, leads to the high morbidity and mortality rates in the province

(KwaZulu-Natal Department of Health, 2015). Therefore, increasing VCT at conventional testing sites such as the hospital or clinic, is insufficient in increasing the number of individuals tested and managed for HIV. Internationally, the dental workplace has been identified as an opportune gateway for oral health care workers to detect HIV, promote rapid HIV testing and manage infected individuals (Glick *et al.*, 1994; Campo *et al.*, 2012; Santella, Conway and Watt, 2016). There is no published evidence in South Africa that explore the knowledge, attitudes, perceptions and practices of oral health care workers regarding HIV testing in the dental workplace, thus this study is a niche and valuable to determine the barriers and opportunities to implement HIV testing to the public and private dental workplaces in eThekweni. The knowledge, attitudes, perceptions and practices of oral health care workers may influence oral health planners in developing an HIV testing policy for the implementation of HIV testing at the dental workplace in eThekweni.

1.8 Chapter outline (Format of the dissertation)

The current study is presented in five chapters as outlined below.

Chapter 1: Introduction

The first chapter of this research study is founded on the detrimental impact of HIV/AIDS on a global, national and provincial scale. Focus was placed on the vulnerability of young women and adolescents, as well as key population groups and contributing factors to the high prevalence of HIV/AIDS. Barriers to low uptake of VCT and the lack of knowledge of one's HIV status was explored. Additionally, this chapter brought focus to oral manifestations of HIV and the role of the oral health care worker in early detection of HIV and the importance of prompt initiation of ART in reducing the morbidity and mortality rates associated with HIV/AIDS. The rapid HIV testing method was highlighted in this chapter as a suitable testing technique in health facilities in South Africa. This chapter also highlighted international studies exploring the knowledge, attitudes and perceptions of oral health care workers regarding VCT at the dental workplace, as well as the paucity of published data in South Africa regarding VCT at the dental workplace. The existent shortfalls pertaining to this research topic are framed explicitly in the problem statement. The

purpose and research questions of the study are described in this chapter and needs to be reviewed. Finally, the aims and objectives are outlined and the significance of the study is described.

Chapter 2: Literature review

This chapter delves into the pathogenesis, epidemiology and transmission of HIV, as well as its clinical oral presentation and classification of oral HIV lesions. A situational analysis of KwaZulu-Natal and eThekweni was conducted by means of online reviews of annual reports by the KwaZulu-Natal Department of Health, exploring the geography, disease profile, access to primary health care facilities, socio-economic background of the population and challenges facing provincial and national health departments regarding service delivery. The high prevalence of HIV/AIDS and management strategies were highlighted in this chapter. Additionally, barriers to the low rate of HIV testing in South Africa are recognised as lack of access to HIV testing services, lack of HIV knowledge and stigma and discrimination associated with HIV/AIDS. HIV testing methods and protocols were outlined in this literature review with regards to the types of HIV testing methods, linkage and continuum of HIV care, bioethical considerations and the use of the rapid HIV testing method in the dental workplace. This chapter highlights the importance of early opportunistic HIV screening and importance of the oral health care worker in the recognition of HIV oral manifestations. The literature review provides insight into the knowledge, attitudes and perceptions of HIV testing in international dental workplaces and recognises the lack of published evidence regarding the knowledge, attitudes and perceptions of oral health care workers, resulting in a gap in HIV service delivery in South Africa.

Chapter 3: Methodology

This chapter describes the steps involved in designing the study, by virtue of its location, study population, sample size, inclusion and exclusion criteria, data collection methods along with the required tools, the qualitative and quantitative data processing and finally the ethical aspects taken into due consideration in this study.

Chapter 4: Manuscript presentations

The fourth chapter is presented in a manuscript format consisting of one article intended for submission to a peer-reviewed journal.

Chapter 5: Conclusion and recommendations

The last chapter summarises the quantitative and qualitative results obtained from this study according to the aim, objectives and research questions. Useful recommendations are outlined in this chapter which can be considered to improve the HIV epidemic in KwaZulu-Natal and in turn, South Africa.

1.9 Summary

The first chapter explored the impact of HIV/AIDS on an international, national and provincial level, as well as the perceived barriers to HIV testing. This chapter stressed the importance of early HIV screening, particularly by the oral health care worker, and recognised the dental workplace as an opportune setting for HIV testing. The purpose of this study, research questions, aim, objectives and significance were clearly outlined. Each chapter of this dissertation with respect to the organisation of the contents was described in detail.

Chapter 2: Literature Review

Preamble

The review of the literature was aimed at gaining insight into the background of HIV with regards to the pathogenesis, epidemiology, transmission, clinical oral presentation and classification. The prevalence of HIV/AIDS in KwaZulu-Natal and eThekweni is high, therefore a situational analysis was conducted which explored the geography, socio-economic background of its population, disease profile, access to primary health care services and challenges facing provincial and national health departments. Due to the global impact of HIV/AIDS, international, national and provincial HIV/AIDS management strategies were highlighted in this review. The literature review recognises the importance of early opportunistic HIV screening and has identified chief barriers to VCT such as lack of access, lack of HIV knowledge and stigma associated with HIV/AIDS. HIV testing in South Africa was explored in this literature review, with regards to types of HIV testing, particularly the rapid HIV testing method, linkage to HIV care and bio-ethical considerations of HIV testing in the dental workplace. A comprehensive exploration of the oral manifestations of HIV and the pertinent role of the oral health care worker was documented. Furthermore, the literature review explored international studies regarding knowledge, attitudes, perceptions and practice of oral health care workers on HIV testing at the dental workplace and acknowledged the paucity of published evidence on this topic in South Africa. A comprehensive and thorough search through PUB MED, Medscape Dentistry, other PDF search engines such as Google, Yahoo, Bing and dental journals was conducted to gain sound information and understanding of the subject matter.

2.1 Introduction

2.1.1 Background of HIV/AIDS

As recent as 1983, HIV was identified to be the source of AIDS by destroying CD4+ T cells (SAHO, 2011) which are imperative for optimal functioning of the human immune system (SAHO, 2011). Over a period of time, the HIV infection drastically weakens the human immune system,

making individuals susceptible to multiple infections, with the most common infection being Tuberculosis (SAHO, 2011). Although HIV has been identified as the pre-cursor of AIDS, numerous studies have found that HIV infected individuals may lead a healthy life with a good life expectancy, provided antiretroviral therapy (ART) is initiated immediately followed by healthy lifestyle choices (Johnson et al., 2013; Katz and Maughan-Brown, 2017; Centers for Disease Control and Prevention, 2018). According to the Centers for Disease Control and Prevention (2018), an individual who is diagnosed early with HIV and treated promptly, can live nearly as long as an individual who does not have the HIV infection (Centers for Disease Control and Prevention, 2018). Therefore, emphasis is placed on early detection of HIV as a key factor in lowering the morbidity and mortality associated with the disease.

Due to the initial slow progression of the HIV infection, oral HIV lesions often serve as clinical markers (Coogan, Greenspan and Challacombe, 2005) for oral health care workers to detect and monitor the progression of the disease (Coogan, Greenspan and Challacombe, 2005). In 1992 the World Health Organization (WHO) and the European Commission (EC) Clearinghouse developed a classification based on the incidence of HIV oral lesions in HIV infected individuals (WHO Collaborating Centre on Oral Manifestations of the Immunodeficiency Virus, 1993). In 2002, a review of the classification was conducted and it was found that the EC-Clearinghouse classification developed in 1992, remains a cornerstone classification (Krishna, Zemse and Derossi, 2011). (Table 1)

Table 1: Classification of oral HIV manifestations

Group 1: Lesions strongly associated with HIV infection	Group 2: Lesions less commonly associated with HIV infection	Group 3: Lesions seen in HIV infection
<p>Candidiasis Hairy leukoplakia Kaposi's sarcoma Non-Hodgkin's lymphoma Periodontal disease (linear gingival erythema, necrotizing ulcerative gingivitis, necrotizing ulcerative periodontitis)</p>	<p>Bacterial infections:</p> <p><i>Mycobacterium aviumintracellulae</i> Mycobacterium tuberculosis Melanotic hyperpigmentation Necrotizing (ulcerative) stomatitis Salivary gland disease Dry mouth due to decreased salivary flow Unilateral/bilateral swelling of salivary glands Thrombocytopenia purpura Non-specific ulcerations</p> <p>Viral infections:</p> <p>Herpes simplex virus Human papillomavirus Condyloma acuminatum Focal epithelial hyperplasia Verruca vulgaris Varicella-zoster virus</p>	<p>Bacterial infections:</p> <p><i>Actinomyces Israelii</i> <i>Escherichia coli</i> <i>Klebsiella pneumonia</i> Drug reactions (ulcerative, erythema multiforme, lichenoid, toxic epidermolysis) Cat-scratch disease Epithelioid (bacillary) angiomatosis</p> <p>Fungal infection other than candidiasis:</p> <p><i>Cryptococcus neoformans</i> <i>Geotrichum candidum</i> <i>Histoplasma capsulatum</i> <i>Mucoraceae (mucomycosis zygomycosis)</i> <i>Aspergillus flavus</i></p> <p>Neurological disturbances:</p> <p>Facial palsy Trigeminal neuralgia</p>

Source: The 2002 WHO and European Community (EC) Clearinghouse classification (WHO Collaborating Centre on Oral Manifestations of the Immunodeficiency Virus, 1993).

The main mode of HIV transmission remains heterosexual unprotected sex and accounts for approximately 85% of all HIV-1 infections (Simon, Ho and Karim, 2006). However, cross contamination of infected blood via blood transfusions, unsterilised needles, sharing injections, as well as needle-stick and occupational injuries, have been identified as modes of transmission of

the infection (U.S Department of Veterans Affairs, 2018). A unique defining feature of HIV/AIDS is the burden it has on women and children, as the infection can pass from mother to child during pregnancy, birth or breastfeeding (U.S Department of Veterans Affairs, 2018). Women account for 42% of infected individuals worldwide, with over 70% living in sub-Saharan Africa (UNAIDS, 2006). Additionally, the HIV infection rate is three to six times higher in female adolescents than male adolescents (UNAIDS, 2006). Reasons for this has been documented as sexual coupling of young women with older men, concurrent sexual relationships, partner change, sexual practices, pre-existing sexually transmitted diseases, population mobility patterns, recreational drug or alcohol use (Korenromp *et al.*, 2005; UNAIDS and Kharsany, 2016).

An advancement in HIV testing technology is the rapid HIV test, which has been recognised for its quick yielding results by health care providers and individuals throughout the world (Glick, 2005; Moodley *et al.*, 2008; Austin, 2009; Campo *et al.*, 2012; Hutchinson *et al.*, 2012; Mwisongo *et al.*, 2016). However, despite the continual advancement in the diagnosis and treatment of HIV, a cure for the infection remains elusive (Simon, Ho and Karim, 2006). Drug therapy such as Antiretroviral treatment (ART) and Highly active antiretroviral therapy (HAART), are successful in viral suppression (Simon, Ho and Karim, 2006), however, prevention is better than cure. Knowledge of one's HIV status is essential in combating the spread of HIV/AIDS (Rennie and Behets, 2006). However, according to Manzi *et al.*, (2005), fear of knowledge of one's HIV status and stigma or discrimination associated with HIV/AIDS, have discouraged many individuals from seeking VCT. Numerous authors have identified prevention as the key component in eliminating the HIV/AIDS pandemic (Rennie and Behets, 2006; Simon, Ho and Karim, 2006; Lane, 2008; Chonco, 2016; UNAIDS and Kharsany, 2016).

With much emphasis placed on prevention, one needs to examine the many contributing factors for the high prevalence of HIV/AIDS in South Africa. Poverty, high incidence of sexually transmitted infections and limited or unequal access to primary health care services, were reported to be contributing factors to the infection (Bazilli *et al.*, 2006). Similarly, De Cock, Mbori-Ngacha and Marum (2002); Kalichman and Simbayi (2003) and Asante (2007), reported the lack of access to HIV testing services, lack of HIV/AIDS knowledge, poor HIV referral patterns or linkages to care and high levels of HIV related stigma as contributing factors to the high rate of HIV/AIDS

in South Africa. However, one of the most concerning factors is that many South Africans do not know their HIV status due to low uptake of HIV testing services (Van Wyk, 2003; UNAIDS and Kharsany, 2016). HIV testing forms an integral component in the prevention of the infection by enabling early detection, management and continuum of care of the HIV infected individual (Lane, 2008). Similarly, according to UNAIDS (2016), knowledge of one's HIV status forms an essential component to HIV prevention and treatment. This disconnect of the low uptake of HIV testing services and lack of HIV status knowledge, is associated with individuals' perception of low risk of contracting the infection, poverty and unemployment linked to gender inequalities (UNAIDS and Kharsany, 2016).

2.2 Situational analysis: KwaZulu-Natal province

KwaZulu-Natal is situated in the South East of South Africa with an area of 92,100 square kilometres (KwaZulu-Natal Department of Health, 2016, p.13). KZN is bordered by Swaziland and Mozambique to the North, by the Indian Ocean to the East, by the Eastern Cape province to the South, by Lesotho and Free State province to the West, and by Mpumalanga province to the Northwest (The Editors of Encyclopaedia Britannica, 2017). Geographically, the province is divided into low land region along the eastern coast, rolling planes in the central section and mountainous areas in the Western and Northern parts (KwaZulu-Natal Department of Health, 2016, p.13). The province consists of 828 wards, 51 local municipalities, 10 are district municipalities and 1 metropolitan municipality, being the eThekweni metropolitan municipality (KwaZulu-Natal Department of Health, 2016, p.13). KZN is the second most populated province, constituting 19.9% of the country's total population and comprises of a majority Black population accounting for 87.2%, followed by 7.2% Indian/Asian, 4.2% White and 1.4% Coloured (Statistics South Africa, 2017).

2.3 Situational analysis: eThekweni district

The Metropolitan Health District of eThekweni comprises of 103 wards in a 2,297 square kilometer area (KwaZulu-Natal Department of Health, 2015) extending from Umkomaas in the South to Tongaat in the North and Cato Ridge in the West (KwaZulu-Natal Department of Health, 2015).

This district shares its borders with iLembe, Ugu and UMgungundlovu districts (KwaZulu-Natal Department of Health, 2015). eThekwini contains a population of approximately 3,464,205 people, with the greatest constituent coming from the South (41%), then North (32%) and finally West Region (27%) (KwaZulu-Natal Department of Health, 2015). The district is further divided into 8 sub districts, namely: South Central, South West, Umlazi and Engonyameni, Lower South, North Central, Greater Inanda /Tongaat, Inner West and Outer West (KwaZulu-Natal Department of Health, 2015). The majority of the population are of Black ethnicity (71.9%), followed by Indian/Asian (16.3%) and Coloured (2.2%) (KwaZulu-Natal Department of Health, 2015). The majority of the population are below 35 years old (62%) (KwaZulu-Natal Department of Health, 2015). Forty two percent (42%) of eThekwini's population over the age of 15 have grade 12 education level (KwaZulu-Natal Department of Health, 2015).

2.4 Health facilities in eThekwini district

In the eThekwini district, there are currently 6 mobile units, 110 fixed clinics, 8 community health centres and 4 district hospitals which provide primary health care services such as VCT to the population of eThekwini (KwaZulu-Natal Department of Health, 2017, p.11). These health facilities are dually managed by local governments and the province of KZN (KwaZulu-Natal Department of Health, 2015, p.19). However, it was found that many Primary health centers (PHCs) managed by local governments, lack funding and resources and thus fail to provide comprehensive services, resulting in an influx of patients to already heavily burdened provincial clinics (KwaZulu-Natal Department of Health, 2015, p.20). The largest number of PHC facilities are found in the densely populated sub-district of Umlazi (KwaZulu-Natal Department of Health, 2015), however, there are no Community Health Centers (CHCs) and mobile unit services available to accommodate this large population (KwaZulu-Natal Department of Health, 2015, p.20). There are insufficient PHCs in the Central business district (CBD) of eThekwini, which has led to an overreliance on regional hospitals for primary health care services (KwaZulu-Natal Department of Health, 2015, p.20). It has been reported that all CHCs are located in the North and West sub-districts of eThekwini, with an absence of CHCs in the South, except for Cato Manor CHC (KwaZulu-Natal Department of Health, 2015, p.20). According to the eThekwini District Health Plan 2014/2015, the Inner West has one CHC, 14 clinics and a substantial number of

mobile clinics. North Central has one CHC, 12 clinics and sufficient mobile clinics (KwaZulu-Natal Department of Health, 2015, p.20). Greater Inanda/Tongaat possess the greatest number of CHCs (n=4) in eThekweni and clinics (n=14), which are predominantly managed by local governments (KwaZulu-Natal Department of Health, 2015, p.20). There is an absence of CHCs in the South West sub-district and 24 hour services are not available (KwaZulu-Natal Department of Health, 2015, p.20). Additionally, these areas in eThekweni do not have Provincial CDCs (Centers for Disease Control) or Satellite clinics (KwaZulu-Natal Department of Health, 2015, p.20). eThekweni has 2 district hospitals situated far apart from each other, namely: Osindisweni in the Greater Inanda/ Tongaat Region which caters to a population of 335 951 and Wentworth Hospital situated in South Central and caters to a population of 333 740 (KwaZulu-Natal Department of Health, 2015, p.21). It is evident that the state of public health facilities in eThekweni requires greater focus and support from the Department of Health in the form of funding, infrastructure and resources in order to provide equitable, effective and efficient health services to its population.

The number of district hospitals in eThekweni are few compared to the high volume of patients that seek medical attention (KwaZulu-Natal Department of Health, 2015, p.21). In 2011, KwaZulu-Natal was reported to have the third highest poverty measure in South Africa (56.6%), with 28% of citizens living in extreme poverty and 29% living in absolute poverty (KwaZulu-Natal Department of Health, 2016, p. 18). Additionally, KwaZulu-Natal's most densely populated district is eThekweni, constituting 33.5% of the total provincial population (KwaZulu-Natal Department of Health, 2016). eThekweni has a high unemployment rate of 30.2% of which 54% of the unemployed in KwaZulu-Natal live in eThekweni, whilst 31% of the population live in poverty (KwaZulu-Natal Department of Health, 2015). Therefore, the majority of patients in eThekweni rely on public health and transport services due to financial constraints. Furthermore, the poor mostly reside in rural areas of KZN and it was found that the scattered distribution of homesteads in rural KwaZulu-Natal posed access and transport challenges in terms of equitable service delivery (KwaZulu-Natal Department of Health, 2016). In order to accommodate the influx of patients attending public health services in eThekweni, five regional hospitals in eThekweni share level-1 services (primary health care services such as VCT) with the district hospitals (KwaZulu-Natal Department of Health, 2015), however, there are cost implications and

compromised quality of care (KwaZulu-Natal Department of Health, 2015). The inability to manage the influx of patients at primary health care level, demands the input from the department of health for improving health care planning and execution.

2.5 Challenges facing health care in KwaZulu-Natal

Access to health care remains a major concern in KwaZulu-Natal (KwaZulu-Natal Department of Health, 2016, p.33). eThekweni is plagued by Tuberculosis (TB) (21%), diarrhoeal disease (8.7%) and HIV (8.6%) (KwaZulu-Natal Department of Health, 2015) which are the leading contributors to lives lost, especially those of women and children (KwaZulu-Natal Department of Health, 2015, p.17). The lack of financial aid to districts such as eThekweni, has resulted in a growing burden of disease and mortality (KwaZulu-Natal Department of Health, 2015, p.17). According to the eThekweni District Health Plans 2015/2016, budget allocations have reduced drastically over the past three years in the district and expenditure remains high, putting a strain on delivering equitable health care (KwaZulu-Natal Department of Health, 2015, p.10). Additionally, infrastructure improvements in line with the National Core Standards, pose a challenge for many health facilities in eThekweni due to a limited budget that is prioritised for maintenance and servicing of equipment (KwaZulu-Natal Department of Health, 2015, p.10). Due to a restricted budget, the construction of additional public health facilities could not be accomplished (KwaZulu-Natal Department of Health, 2016, p.36). Furthermore, according to South Africa's National Strategic Plan for HIV, TB and STIs 2017-2022, KwaZulu-Natal bears the highest HIV prevalence (18%) in South Africa. Sexually transmitted diseases such as syphilis, gonorrhoea and HSV-2 infections, remain rife despite a decrease (from 11.2% to 1.6%) noted between 1997 and 2011 (National Department of Health of South Africa, 2011). Thus, the strain of these diseases, influx of patients attending public health facilities in the province, as well as reduced budgets, place an unequal demand on the South African health system (KwaZulu-Natal Department of Health, 2016).

2.6 HIV/AIDS management strategies

The KwaZulu-Natal Department of Health strives to provide coordinated health services to the public which are comprehensive and sustainable (KwaZulu-Natal Department of Health, 2017). In response to the alarming prevalence of HIV/AIDS in the province, the National Health Insurance has been introduced as a strengthening component in improving the effectiveness in the fight against HIV/AIDS (KwaZulu-Natal Department of Health, 2015). The Health Patient Registration System has been introduced to districts such as eThekweni with 1 122 262 registered patients already on the system (KwaZulu-Natal Department of Health, 2017). Currently, there are 61 General Practitioners and 82 Pharmacy Assistants contracted to the National Health Insurance (KwaZulu-Natal Department of Health, 2017) who provide primary health care services to the public. The National Health Insurance aims to improve access to health services at entry points of the public health system, thereby managing HIV and reducing the incidence of HIV (KwaZulu-Natal Department of Health, 2017). However, not enough focus is placed on the dental sector as an opportunistic point of entry for providing VCT to the public.

The province of KwaZulu-Natal bears the heaviest burden of HIV in South Africa, particularly amongst adolescent girls and young women (PEPFAR, 2017). In response to the high infection rate among this vulnerable population, “She Conquers” national campaign seeks to empower and enlighten this key group about HIV/AIDS (PEPFAR, 2017). Additionally, President’s Emergency Plan for AIDS Relief (PEPFAR) has developed a programme called DREAMS which aims to develop young women into **D**etermined, **R**esilient, **E**mpowered, **A**IDS-free, **M**entored, and **S**afe women (PEPFAR, 2017). High priority districts such as eThekweni, where HIV transmission is the highest, are receiving PEPFAR DREAMS interventions, which focuses on facilitating access to education and economic opportunities, post-violence care, parenting/caregiver programs, and address the pertinent risk factors such as poverty, lack of education, gender and economic inequality (PEPFAR, 2017). Additionally, PEPFAR has partnered and assisted the province by providing funding and technical support for the execution of HIV and TB prevention, treatment and care services in KwaZulu-Natal (PEPFAR, 2017). Preventative strides include HIV counselling and testing, condom promotion and distribution, availability of antiretroviral therapy (ART), care of vulnerable youth and research (PEPFAR, 2017). Furthermore, the KwaZulu-Natal

Department of Health has taken bold steps in HIV prevention, care and support by providing community based programs and campaigns to infected individuals, adolescents, young women, orphans and vulnerable children and youth (PEPFAR, 2017).

The profound impact that HIV/AIDS has had on South Africa, has been described by the late former South African President, Mr Nelson Mandela: *“This is a war, it has killed more people than has been the case in all previous wars, we must not continue to be debating, to be arguing, when people are dying and I have no doubt that we have a reasonable and intelligent government, and that if we intensify this debate inside, they will be able to resolve it”*- Former South African President, Nelson Mandela, Sunday Times, Sunday 10 Aug 2003 (SAHO, 2011). Since the outbreak of HIV/AIDS, numerous management strategies have been made globally in line with the Millennium Development Goals to stop the spread of the disease (UNAIDS, 2016) and reduce the associated morbidity and mortality rates (UNAIDS, 2016). In South Africa, since 2010, new HIV infections have decreased by 49% (UNAIDS, 2017a) and AIDS-related deaths have decreased by 29% (UNAIDS, 2017a). In response to the HIV/AIDS burden in South Africa, the National Strategic Plan (NSP) 2017-2022 for HIV, sexually transmitted infections (STI) and tuberculosis (TB) was launched (South African National Aids Council (SANAC), 2016). This plan consists of formulated strategic goals to reduce new HIV infections by at least 50%, provide ART to at least 80% of infected patients and reduce stigma and discrimination related to HIV and TB by 50% (Chonco, 2016; South African National Aids Council (SANAC), 2016). As recent as September 2016, South Africa adopted the World Health Organization (WHO) Universal Test and Treat (UTT) guidelines on HIV treatment (KwaZulu-Natal Department of Health, 2017). The UTT guideline recommends that individuals who test HIV positive should immediately commence with ART, which supports the United Nation’s 90-90-90 targets of ensuring that 90% of individuals are aware of their HIV status; 90% of those individuals that are HIV positive are on treatment and 90% of those individuals that are on treatment are virally suppressed (KwaZulu-Natal Department of Health, 2015; UNAIDS, 2017a). According to the South African Health Minister, Dr Aaron Motsoaledi, the 90-90-90 strategy can be achieved through “mass testing in every possible setting: schools, universities, workplaces, churches and communities.” The South African Department of Health has stressed early detection as a vital component in reducing the debilitating impact of the disease in South Africa (KwaZulu-Natal Department of Health, 2015).

Due to the significantly high prevalence of HIV among young vulnerable South African women and adolescents aged 15-24 years, a three year national prevention campaign called “She Conquers” was launched in 2016 (South African National Aids Council (SANAC), 2016). The campaign aims at decreasing new HIV infections among young females, lessen adolescent pregnancies and violence against young women (South African National Aids Council (SANAC), 2016), and improve and retain the number of young women in school (UNAIDS, 2017a). Additionally, the National Higher Education and Training HIV/Aids Programme (HEAIDS), launched the “First Things First” campaign in 2016 which targeted students in the higher education and training sector (Hitchcock, 2016). This campaign was launched with a long term goal of reaching out to all nine provinces in South Africa, beginning with KwaZulu-Natal. The primary aim of this campaign is to promote HIV testing to approximately two million students in an effort to provide treatment for those infected, promote awareness and education of HIV (South African National Aids Council (SANAC), 2016). With the alarmingly high incidence of HIV/AIDS in South Africa, the National Department of Health has emphasised the significance of early opportunistic HIV testing (South African National Aids Council (SANAC), 2016). An HIV testing and counselling national campaign was conducted in 2010 which reached out to 15 million South Africans to test for HIV by the following year June 2011 (South African National Aids Council (SANAC), 2016).

It is evident that momentous efforts have been made globally and nationally in curbing the detrimental effects of HIV/AIDS, however, the task ahead has been described as “daunting” (UNICEF, 2015), as the executive director recognises the barriers and challenges that hinder combating the disease. According to the executive director of UNAIDS, Mr Michel Sidibé:

“People are left behind because of prejudice, discrimination, poverty and poorly conceived laws. Young people and adolescents remain at higher risk because of policies and social and cultural norms that prevent them from receiving comprehensive sexuality education and deny them the skills and the autonomy to control their own sexuality and reproductive choices. Women and girls are particularly negatively affected by gender inequities and as a result face increased vulnerability to HIV”- (UNICEF, 2015, p. 1).

2.7 Barriers to HIV testing

2.7.1 Lack of access to HIV testing services in eThekweni district

There are an estimated 362 514 HIV infected adults and 13 878 children below the age of 15 years are that are currently on Antiretroviral therapy (KwaZulu-Natal Department of Health, 2017, p.82, 84, 86). Currently, there are six mobile units, 110 fixed clinics, eight community health centres and four district hospitals which provide primary health care services such as VCT to the eThekweni population (KwaZulu-Natal Department of Health, 2017). In order to gauge the performance of these health facilities and the level of satisfaction by the population it serves, an “Ideal Clinic Dashboard” was established (Department of Health of South Africa, 2017). An “Ideal Clinic” has been described as a clinic with “adequate infrastructure, staff, medicine and supplies, good administrative processes and adequate bulk supplies that use applicable clinical policies, protocols, guidelines as well as partner and stakeholder support, to ensure the provision of quality health services to the community” (Department of Health of South Africa, 2017, p.14). The KwaZulu-Natal annual report 2016/2017, reported that the percentage of fixed Primary health care facilities scoring above 70% on the Ideal Clinic Dashboard was 55.1 % in eThekweni, whilst the patient satisfaction survey rate in fixed Primary health care facilities was 13.5% (Department of Health of South Africa, 2017). In 2012, the total number of fixed dental facilities was 60, with 52% of them being integrated in district hospitals, while 13% were located in primary health care clinics and 22% in community health centers (Dookie, Singh and Myburgh, 2017). In 2017, eThekweni had 10 fixed dental facilities and is reported to be among the three districts that had the least number of dental facilities when compared to other districts with a lower population density (Dookie, Singh and Myburgh, 2017).

The low satisfaction rate and standards of the fixed primary health care facilities are indeed a matter of concern as it suggests that there are access barriers to patients receiving optimal and crucial primary health care services such as VCT for HIV (KwaZulu-Natal Department of Health, 2015). A large number of the inhabitants utilize public transport (40%) (KwaZulu-Natal Department of Health, 2015), however, transport routes are centralized thus resulting in inaccessibility to PHC clinics in less centrally located areas (KwaZulu-Natal Department of

Health, 2015). According to the KwaZulu-Natal Department of Health, the walking distance from patient's place of residence to the nearest primary health care facility should fall within a 5 kilometer radius (KwaZulu-Natal Department of Health, 2017). However, a survey carried out in 2010 reported that 672 272 houses were outside the recommended health care facility radius (KwaZulu-Natal Department of Health, 2017). Due to the inadequate number of health care facilities to service the population, sub-optimal usage of community health care centers, lack of resources and inaccessibility due to transport routes, as well as urbanisation and unprecedented densely populating areas in eThekweni, many patients are left unsatisfied and untreated, adding to eThekweni's health burden (KwaZulu-Natal Department of Health, 2015).

Additionally, it has been reported that low HIV testing rates in South Africa have been attributed to inadequate access to HIV testing services (World Health Organization *et al.*, 2005; Hutchinson and Mahlalela, 2006; Weiser *et al.*, 2006; Lane, 2008; Mohlabane *et al.*, 2016). Shortages of skilled service providers, inadequate material resources, poor infrastructure, inadequate procurement and supply management systems, have been identified as reasons in Sub-Saharan countries for the lack of access to HIV testing sites (Matovu JK and Makumbi FE, 2007). Similarly, the eThekweni District Health Plan 2015/2016, demonstrated the lack of Primary Health care services and resources particularly in rural and outlying areas in eThekweni, which rely on mobile units to receive health care. Furthermore, sub-optimal usage of Community health centers due to unprecedented influx of patients and limited resources was reported (KwaZulu-Natal Department of Health, 2015). There are also no provincial centers for disease control and prevention or satellite clinics in eThekweni (KwaZulu-Natal Department of Health, 2015).

2.7.2 Lack of HIV knowledge

Knowledge regarding HIV, together with a reduction in high risk behavioural practices are imperative in overcoming and reducing the spread of HIV/AIDS (Shisana *et al.*, 2014). However, knowledge regarding HIV/AIDS is low in sub-Saharan Africa (Shisana *et al.*, 2014). A Kenyan study by Cherutich *et al.*, (2012) investigated the poor level of HIV status knowledge among patients, as a barrier to HIV prevention and care. It was found that the majority of HIV infected individuals were not aware of their status, thereby resulting in delayed treatment or no treatment

at all (Cherutich *et al.*, 2012). In South Africa, only 65 percent of individuals have tested for HIV and have knowledge of their HIV status (Shisana *et al.*, 2014). Additionally, only 26.8% of South Africans were knowledgeable regarding the sexual mode of HIV transmission and prevention (Shisana *et al.*, 2014). The South African National HIV Survey (2012), found that adolescents between 15–24 years old (24.3%) and adults aged between 25–49 years old (23.4%) had more knowledge on sexual transmission of HIV than those aged older than 50 years (Shisana *et al.*, 2014). Furthermore, the survey also found that more whites (43.3%) and Indians (41.4%) and those residing in urban formal areas (31.7%), had more knowledge than the black population and those residing in rural areas in South Africa (Shisana *et al.*, 2014). The younger age groups that were more knowledgeable than the older age groups, attributed television as the main influential source of information followed by radio and print media to a lesser extent (Shisana *et al.*, 2014).

A recent study has revealed that only two-thirds (59%) of the South African youth have sound knowledge of HIV prevention (UNFPA ESARO, 2016). However, following an extensive sexuality education campaign, results have indicated a reduction of 33 percent in genital herpes (HSV2) in South African schools (UNFPA ESARO, 2016). Therefore, the importance of HIV education in the form of prevention and promotion campaigns and the importance of HIV status knowledge, is related to a reduction in the spread of HIV and HIV related infections. Numerous studies share the same sentiment that HIV Counselling and Testing (HCT) facilitates early diagnosis for HIV positive persons which helps reduce the risk of further transmission, provides access to care and treatment, while motivating people who test HIV negative to maintain their negative status (Day *et al.*, 2003; Lane, 2008; Peltzer *et al.*, 2009; Mohlabane *et al.*, 2016). This in turn, reiterates that HIV testing and counselling is critical for improving HIV awareness and knowledge among individuals which in turn leads to better behavioural and prevention practices (Mwisongo *et al.*, 2016).

In response to the low HIV status awareness, the National Services Testing Policy, has placed emphasis on increasing HIV testing by targeting all health care workers in the public and private sectors to provide HIV counselling and testing to the public. (National Department of Health of South Africa, 2015). The maintenance of HIV awareness by means of routine HIV testing, provides an opportune avenue for delivering HIV/AIDS prevention and promotion package of care

(Shisana *et al.*, 2014), as well as management and treatment (Shisana *et al.*, 2014). Despite South Africa presenting with the highest HIV testing rate globally (Shisana *et al.*, 2014), HIV knowledge and status awareness remains a pivotal component for ART initiation, which is critical to suppress the virus, prolong life and reduce the transmission of the infection (Shisana *et al.*, 2014).

2.7.3 HIV/AIDS stigma and discrimination

“Potential stigmatization is one of the most notable causes preventing individuals from testing and seeking care” (Young and Bendavid, 2010). It has been discovered that many people are reluctant to test for HIV because of the fear of a positive HIV test, which may result in discrimination from friends, family, colleagues and health care providers (Folkman *et al.*, 1994). Despite factors such as poor access to HIV testing services in predominantly lower and middle income countries like South Africa (World Health Organization *et al.*, 2005), stigma and discrimination remains a constant limiting factor for people testing for HIV (World Health Organization *et al.*, 2005). Stigmatisation has had a severe negative impact on the health and wellbeing of individuals affected by stigmatised conditions, such as HIV/AIDS and sexually transmitted diseases (Lane, 2008). Stigmatisation may adversely affect individuals’ psychological wellbeing by creating a feeling of exclusion and disempowerment, which impedes their access to prevention and treatment services (Lane, 2008; UNAIDS, 2017a). Furthermore, stigmatisation can lead to an increase in vulnerability of individuals becoming infected due to risky behavior patterns and a lack of precaution implementation (Gilmore and Somerville, 1994). Stigma has been described as one of the greatest dreads of those living with HIV and AIDS (International Federation of Red Cross and Red Crescent Societies, 2008). It is evident that stigma and discrimination related to HIV/AIDS, remains a barrier to HIV testing, however, a study by the Human Sciences Research Council (HSRC) showed that only 1% of South Africans reported stigma as a reason not to test for HIV (Shisana *et al.*, 2014). Furthermore, an increasing number of people are voluntarily seeking out testing services to gain insight to their HIV status (Shisana *et al.*, 2014). In 2005, the HIV household survey in South Africa reported a reduction in stigma and discrimination towards people living with HIV when compared to the 2002 survey (Shisana *et al.*, 2014). It has been suggested that scaling up HIV testing services and aggressive ART programmes, has normalised or desensitised HIV, thereby reducing the stigma related to infectious disease like HIV (Shisana *et*

al., 2014). Globally, stigma associated with sensitive issues such as HIV/AIDS, has limited the progress of HIV awareness and prevention campaigns due to many individuals refraining from testing for HIV due to fear or embarrassment (Young and Bendavid, 2010). The UNAIDS Reference Group has recognised this and has stated that by reducing HIV/AIDS related stigma and discrimination at all levels, notably within health care settings, (UNAIDS, 2007) there will be an increase in the need and demand for voluntary HIV testing (Shisana *et al.*, 2014).

2.8 HIV Testing in South Africa

The National HIV Testing Services Policy (2016), is aligned with guidelines developed by the World Health Organization and The Joint United Nations Program on HIV/AIDS (2006). This policy states that “It is the duty and responsibility of all health care workers and health auxiliary workers to inform people about the risks of HIV so that people can make informed decisions about getting an HIV test” and “Healthcare workers shall offer HIV testing to all patients” (Republic of South Africa National Department of Health, 2010). The policy is also aligned with the Human Rights Charter and is aimed at prolonging life and optimising maternal and child survival (Republic of South Africa National Department of Health, 2010). In an effort to reach out to vulnerable and key population groups, the policy states that “HIV testing should be made available at all public health facilities, private healthcare facilities and Non-profit Governmental Organizations (NGOs) who have been approved to offer HIV testing” (Republic of South Africa National Department of Health, 2010). Considering the fact that the National Department of Health has widely advocated for all health care facilities to offer HIV testing, extending VCT to the dental workplace presents as a good opportunity. According to Jürgens (2007), the low uptake of HIV testing by patients was linked to patients’ dependence on Voluntary Counselling and Testing (VCT) which is the sole responsibility of the patient (Jürgens, 2007). The National Department of Health has recognised the low HIV testing rates and thus policies and strategies emphasise the need for increasing the number of tested individuals as a means of reducing the prevalence of HIV/AIDS (Republic of South Africa National Department of Health, 2010).

Provider-initiated HIV testing remains the mainstay approach, however, community-based HIV testing has proved effective in accessing first time testers in large populations (UNAIDS, 2017a).

Increasingly featured is HIV testing by the health care worker at the workplace and home-based self HIV testing (door-to-door) by means of the rapid HIV testing method (UNAIDS, 2017a).

2.8.1 Provider Initiated Counselling and Testing for HIV

Provider Initiated HIV counselling and testing (PICT) is offered by health care workers as a routine standard component of medical care to individuals attending healthcare facilities (Republic of South Africa National Department of Health, 2010). The National Department of Health encourages all health care providers to recommend HIV testing to all individuals attending clinical services in both the public and private sector, regardless if the individual is suspected of having the HIV infection or not (Republic of South Africa National Department of Health, 2010). In this way, the health care provider may be able to make concise medical decisions in the welfare of the patient, which may be difficult to execute without the knowledge of the patient's HIV status (National Department of Health of South Africa, 2015). PICT forms an integral component in increasing the rates of HIV testing and enables health care providers to detect HIV infected individuals, who may not be aware of their HIV status. The PICT model is delivered via two routes: the health care provider offers and conducts HIV testing for the individual or the health care provider refers the individual for HIV testing within the facility (National Department of Health of South Africa, 2015). The National Department of Health has reiterated the importance of increasing HIV testing among patients, as PICT services were increased on a large scale to over 4500 public health facilities, mobile services and non-medical sites (National Department of Health of South Africa, 2015). The National Department of Health has placed focus on prioritising integration of routine HIV testing by adapting the patient flow at health facilities to enable this (Republic of South Africa National Department of Health, 2010).

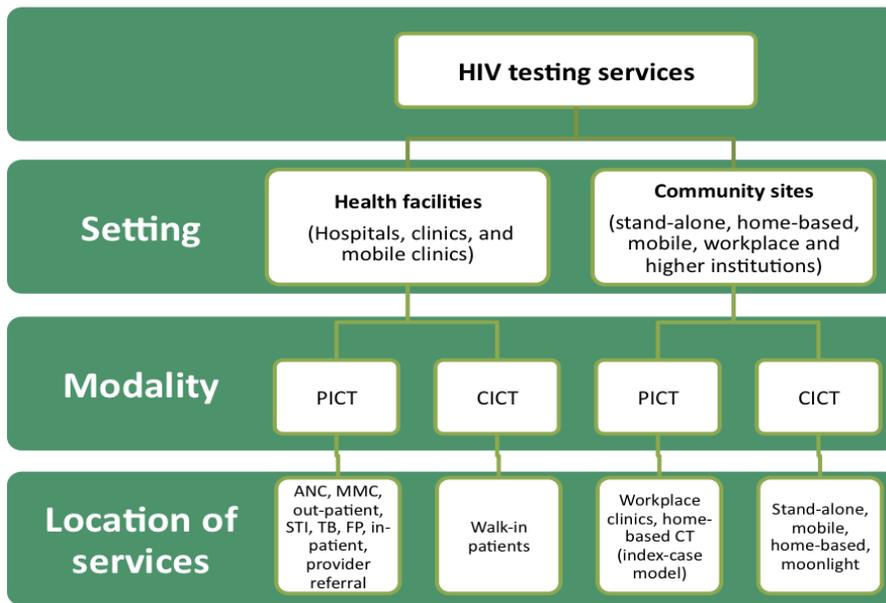
2.8.2 Client Initiated Counselling and Testing for HIV

The Client initiated counselling and testing (CICT) approach can also be described as Voluntary Counselling and Testing (VCT) (National Department of Health of South Africa, 2015). This type of HIV testing is provided for individuals at health facilities that specifically and voluntarily decide to learn their HIV status (Young, Nussbaum and Monin, 2007).

2.8.3 Community based HIV testing

In order to maximise the yield of persons testing for HIV, the National Department of Health of South Africa, has targeted the community through Community-based HIV testing (Republic of South Africa National Department of Health, 2010). This type of HIV testing involves reaching out to the community by means of: mobile outreach campaigns, events, workplace testing, home-based testing, testing in educational settings and places of worship (National Department of Health of South Africa, 2015). It has been found that community outreach programmes are successful in increasing the number of first-time testers thereby ensuring early HIV diagnosis and reaching individuals that may not necessarily seek out health services, such as men, teenagers, pregnant women and children (Republic of South Africa National Department of Health, 2010). (Figure 1)

Figure 1: HIV testing approaches



(National Department of Health of South Africa, 2015, p.9)

The success of these approaches have been well established and are valuable attempts made by the Department of Health to scale up the opportunities for HIV detection, thereby reducing the barriers to HIV testing (World Health Organization, 2007; Leon *et al.*, 2010). However, it is imperative that all HIV testing programmes be actively linked to HIV prevention and promotion education,

treatment, care and support services, thus linkages of care have been developed (National Department of Health of South Africa, 2015).

2.8.4 Linkage to HIV care

Linkage to care has been described as an integral factor to successful HIV treatment (Dombrowski and Kinney, 2017) and is an essential component to retaining the patient in the health system, initiating antiretroviral therapy, and suppressing the viral load (Dombrowski and Kinney, 2017). Despite the fact that early initiation of ART reduces the effects of HIV/AIDS, it is not the sole contributing factor in the reduction of HIV/AIDS. According to the National HIV Testing Services Policy (2016), linkage to HIV care is defined as “a process of actions and activities that support people testing for HIV and people diagnosed with HIV to engage with prevention, treatment and care services as appropriate for their HIV status” (National Department of Health of South Africa, 2015). The term “people living with HIV,” refers to the start of knowledge of HIV sero-positivity and ending with proper referral patterns for continuum of HIV care (Republic of South Africa National Department of Health, 2010). It is thus the responsibility of all health care providers that offer HIV testing to ensure that individuals are referred for appropriate care and linked to allied services, as HIV testing alone is futile (Republic of South Africa National Department of Health, 2010). According to the figure below (Figure 2), individuals diagnosed with HIV at a health facility must start ART immediately; individuals testing positive at a community based HIV testing site must be referred to a health facility for follow up; individuals tested at one health facility and referred to another for care must have a set appointment at the receiving health facility; and individuals referred from one facility to another must have proper referral forms for follow up services (National Department of Health of South Africa, 2015).

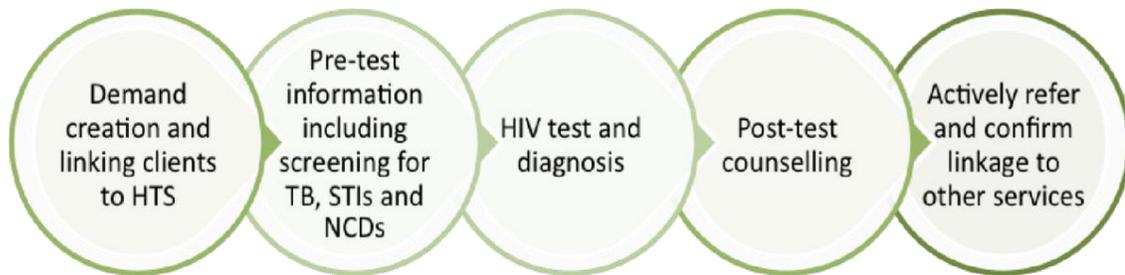
Figure 2: Linkage of HIV care



(National Department of Health of South Africa, 2015, p.23)

While it is imperative to maximise HIV testing for the population of South Africa, the Department of Health has recognised that continuum of care and linkages to HIV health care are of equivalent value (National Department of Health of South Africa, 2015). Thus the National HTS programme has shared focus between efforts to increase VCT for HIV and the outcome of HIV testing, which entails care and retention of the infected individual in the health system (Republic of South Africa National Department of Health, 2010). Those patients who are HIV negative are assisted by means of HIV prevention education and individuals who test positive must successfully be linked into the continuum of HIV care (Republic of South Africa National Department of Health, 2010). Figure 3 shows the continuum of care process for individuals testing for HIV (PICT/CICT/Community based). The individual is provided with pre-test counselling and information, tested for HIV with voluntary consent, provided with post-test counselling and linked to services of care depending on the results of the HIV test (Republic of South Africa National Department of Health, 2010).

Figure 3: Continuum of HIV care



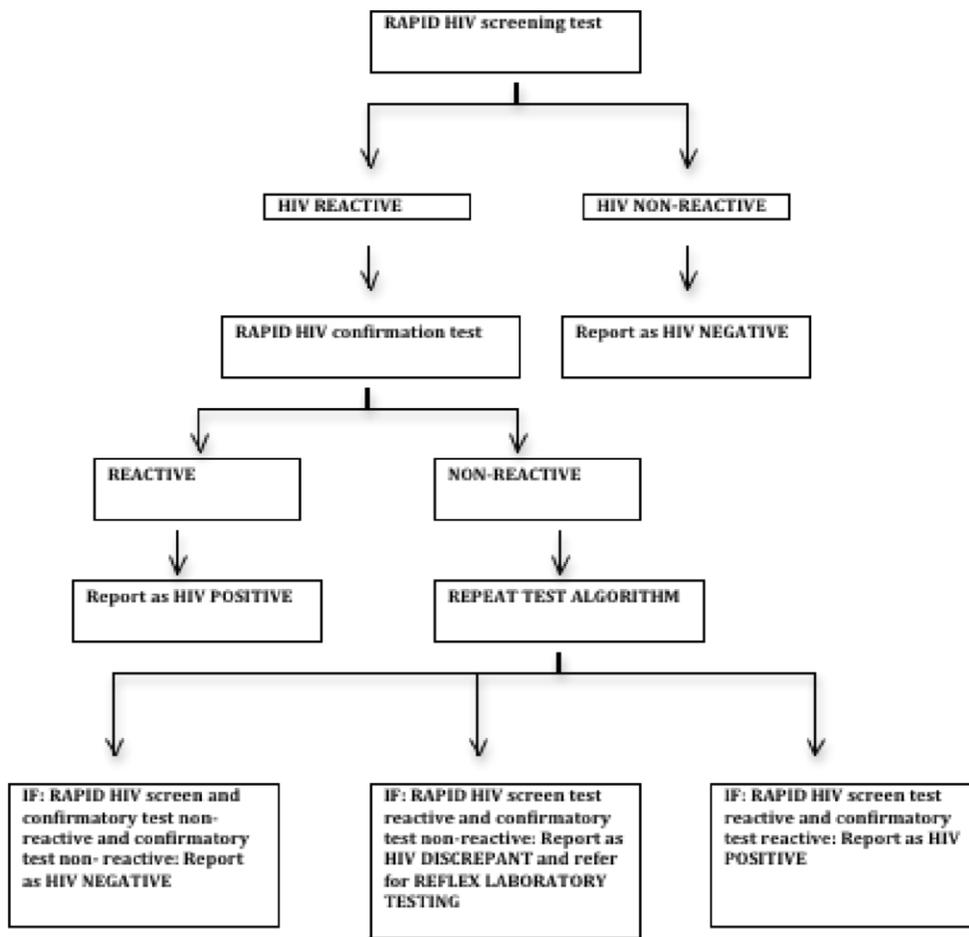
(National Department of Health of South Africa, 2015, p.2)

2.8.5 HIV testing methods in South Africa

The National Department of Health recommends that two HIV testing methods be utilised: a rapid HIV test for adults and children older than 18 months and a polymerase chain reaction (PCR) test for children younger than 18 months to avoid misdiagnosis (Republic of South Africa National Department of Health, 2010). The polymerase chain reaction (PCR) HIV test performed in South Africa is the ELISA test (enzyme linked immune assay) in which antibodies in the patient's serum bind to the HIV proteins and the extent of this binding can be measured (World Health Organization, 2018). Positive test results are then confirmed using the Western Blot method, a more accurate but expensive laboratory based test (World Health Organization, 2018). The lengthy interval between HIV testing and waiting for laboratory results using the ELISA method, has often contributed to poor return of patients to receive their results, which in turn contributes to the HIV crisis, as patients may be HIV positive and unknowingly spread the infection (Vernillo and Caplan, 2007). There is a more cost effective and rapid method of testing for HIV, namely the rapid HIV testing kits (Branson *et al.*, 2006). The rapid HIV tests have gained popularity due to its quick yielding results that can be performed easily and reliably using plasma, serum, whole blood, or saliva obtained by the health care workers with limited laboratory expertise (Greenwald *et al.*, 2006). Rapid HIV tests have been introduced to limited-resource countries, such as South Africa, in order to resolve logistical issues such as limited access to laboratories, slow turn-around time of results and high costs in carrying out the ELISA test (Moodley *et al.*, 2008).

All health care workers in South Africa are encouraged to utilise the cost effective rapid HIV testing method at their workplace (National Department of Health of South Africa, 2015), however, there are specific guidelines to adhere by when performing HIV rapid testing for patients. It is recommended that a serial testing algorithm should be followed (Figure 4). HIV screening is initiated with a rapid HIV test and if reactive, a different rapid HIV test is then performed to confirm the result of the screening test (National Department of Health of South Africa, 2015). If the screening test is non-reactive, a negative result should be reported (National Department of Health of South Africa, 2015), however, it is important to consider the possibility of recent exposure of the HIV infection and that the patient could be in the “window period” of the disease where HIV is undetectable (National Department of Health of South Africa, 2015). In such cases, the patient is tested again in six weeks to confirm the diagnosis (National Department of Health of South Africa, 2015). Should the initial rapid HIV test as well as the second confirmatory rapid HIV test reveal a positive reactive result, the patient will be deemed to be HIV positive and put onto a programme of care (National Department of Health of South Africa, 2015). It is also valuable to note that the selection of rapid test kits used in the testing algorithm should be guided by the National Reference Laboratory and approved by the National Department of Health (National Department of Health of South Africa, 2015).

Figure 4: Rapid HIV testing algorithm

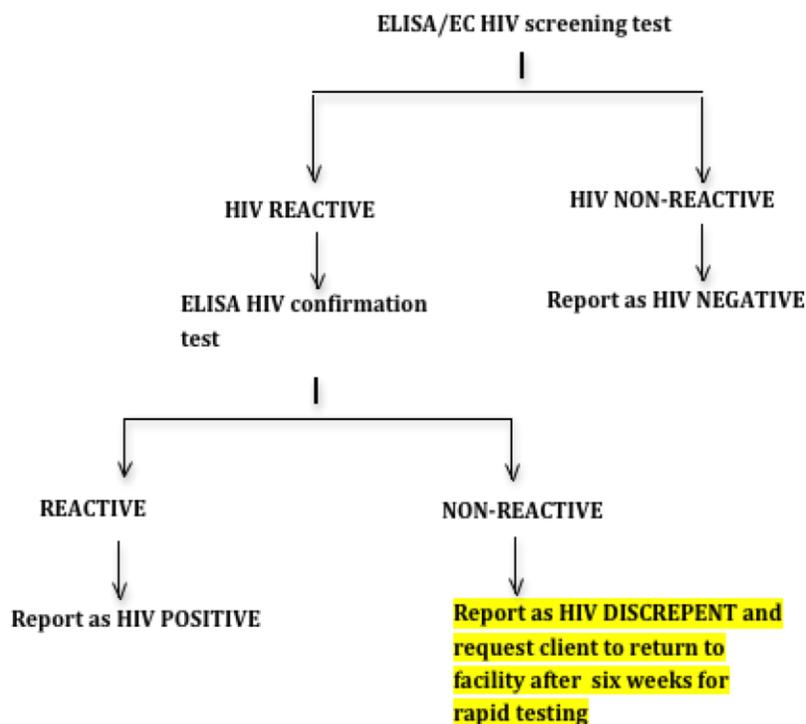


(National Department of Health of South Africa, 2015, p.18)

In case of a discrepant or inconclusive rapid HIV test result, where the first result is reactive and the second negative, the rapid HIV testing algorithm should be repeated immediately (Republic of South Africa National Department of Health, 2010). If the repeat result is non-reactive, a negative result is reported and if the result is positive, a positive result must be reported (Republic of South Africa National Department of Health, 2010). However, in the case of repeat discrepant results, it is protocol that whole blood for an enzyme-linked immunosorbent/chemiluminescent assay (ELISA/EC) must be collected from the patient for the reflex laboratory testing (Republic of South Africa National Department of Health, 2010). The laboratory will conduct a serial testing algorithm using fourth generation (ELISA/EC) testing (Figure 5). Should the result of the initial

ELISA/EC testing be non-reactive, a negative result must be reported and if ELISA/EC results are reactive, a positive result must be reported (Republic of South Africa National Department of Health, 2010). In case of an inconclusive ELISA/EC result that is not resolved by further testing, the patient must be asked to return to the facility for a repeat HIV rapid testing after six weeks (Republic of South Africa National Department of Health, 2010).

Figure 5: Serial testing algorithm using fourth generation (ELISA/EC) testing



(National Department of Health of South Africa, 2015, p.19)

2.8.6 Rapid HIV Testing

Evaluation of the rapid HIV tests have shown that the accuracy of these tests have been compromised in some cases (Moodley *et al.*, 2008). However, a study by Moodley *et al.*, (2008), tested the reliability of the HIV rapid tests and found that the accuracy of the rapid HIV tests, are user dependent. Twelve health care facilities in KwaZulu-Natal were selected for the evaluation of four commonly used HIV rapid tests on 961 participants/patients. Health care workers obtained

blood from participants and specimens were tested using the rapid HIV tests, as well as the ELISA to test for accuracy. Results show that from the 961 specimens tested with ELISA, 553 were negative and 408 were positive (Moodley *et al.*, 2008). Testing with the rapid HIV test, showed that between 98% and 100% of the specimens could be compared with their corresponding ELISA results (Moodley *et al.*, 2008). The sensitivity and specificity was also tested on all four rapid HIV tests and results show 100% sensitivity and 100% specificity (Moodley *et al.*, 2008). Also, all tests were carried out and results interpreted between 3-15 minutes (Moodley *et al.*, 2008). Moodley *et al.*, (2008), explained the need for employing a quality system approach when utilising rapid HIV tests on patients. The study suggested that staff personnel carrying out the test, should undergo continuation of training, monitoring and development to improve rapid HIV testing results (Moodley *et al.*, 2008). Also, quality assurance programmes would be beneficial to ensure accurate results and prevent false results which can be detrimental to individuals' emotional and physical well-being (Mwisongo *et al.*, 2016). The study reiterates that the reliability of the rapid HIV tests is of a high caliber in line with the WHO standard, and thus should be utilised as a quick and cost effective method of testing for HIV (Moodley *et al.*, 2008).

2.8.7 Types of rapid HIV tests in South Africa

A study by Mwisongo *et al.*, (2016) tested the quality of rapid HIV testing in South Africa. The most commonly used rapid HIV tests in South Africa included the: SD Bioline, First response, Advance quality, Determine and G-Ocean. Other uncommonly used rapid tests that were mentioned in the study were: Medmira rapid HIV tests and Abon rapid tests. Internationally, in 2012, the OraQuick over-the-counter rapid HIV test was the first self-testing HIV kit to be approved by the United States Food and Drug Administration (FDA, 2017). Mwisongo *et al.*, (2016) concluded that the quality of rapid HIV testing may be compromised due to poor adherence to guidelines stipulated by National HIV Testing Services Policy (2016). There is therefore a need for health authorities to implement continual training for health care workers and in particular oral health care workers, who have little or no training to ensure rapid HIV tests are performed within the recommended guidelines (WHO, 2004).

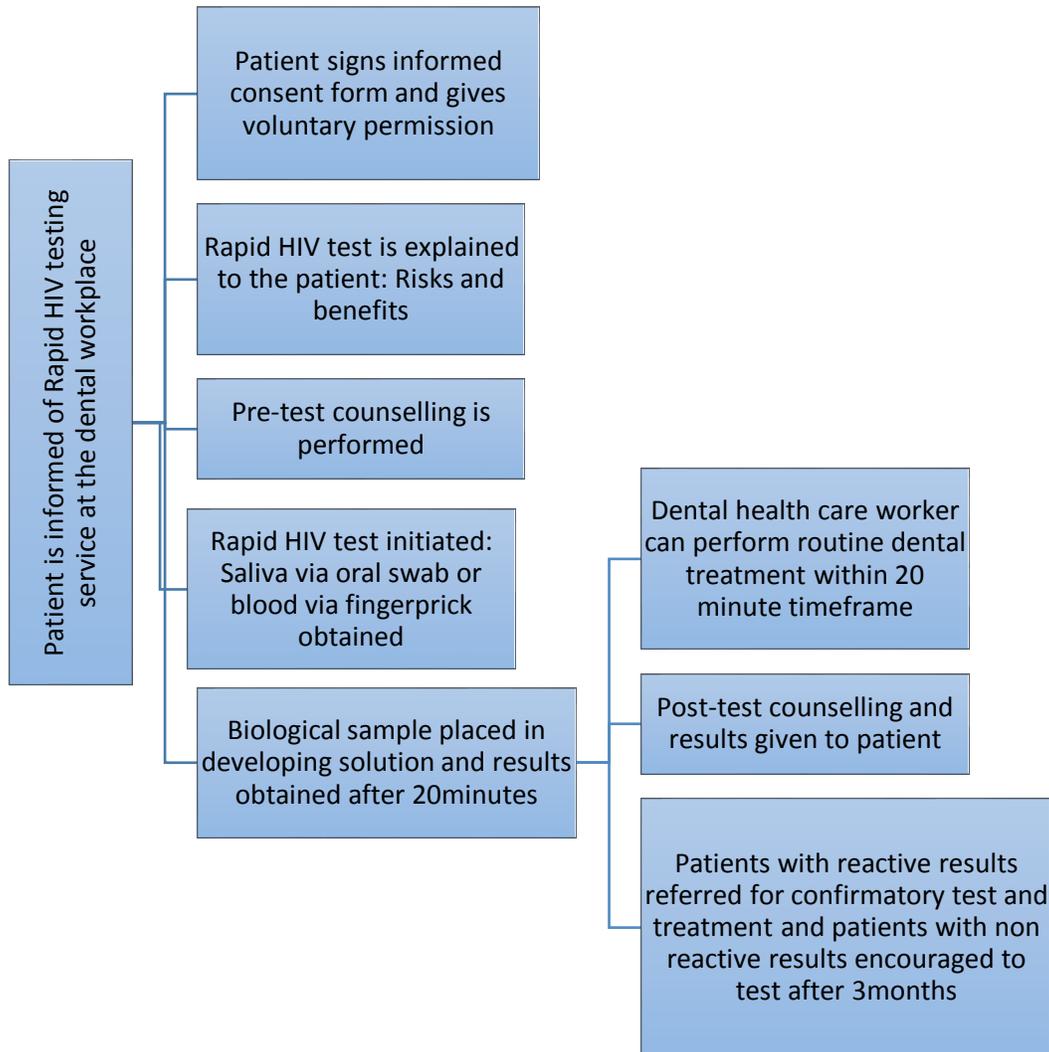
On the other hand, rapid HIV testing has made HIV service delivery in South Africa more efficient and effective, thus making the country's National targets more attainable (National Department of Health of South Africa, 2011). By extending HIV testing sites to the dental workplace and training oral health care workers adequately to perform rapid HIV testing, individuals are given the opportunity to gain access to additional testing locations and can receive their results quicker and seek prompt medical attention if necessary.

2.8.8 Bio-ethical considerations of rapid HIV testing in the dental workplace

The easy accessibility and availability of the rapid HIV tests that detects HIV-1 and HIV-2 antibodies in patient's saliva, has improved the acceptability significantly and created potential for HIV testing in the dental workplace and elsewhere (Hutchinson *et al.*, 2012). However, utilising the rapid HIV tests, requires following the recommendations set out by the Center for Disease Control (CDC) for routine HIV testing (Parish *et al.*, 2017). With the emergence of the rapid HIV test kits, the oral health care worker plays an important role in pre-test and post-test counselling to patients (Austin, 2009; Vernillo and Caplan, 2007). This however, raises ethical considerations. It is imperative that the oral health care worker obtains the patient's informed and voluntary consent before initiating the rapid HIV test (Vernillo and Caplan, 2007). Furthermore, the oral health care worker must exhibit comprehensive knowledge of bioethical principles such as respect for patient autonomy, confidentiality, and be able to manage the patient following HIV test results (Vernillo and Caplan, 2007). It is the responsibility of the oral health care worker to provide pre-test counselling, which entails fully informing the patient about the purpose of the test and risks and benefits of carrying out the test (Mwisongo *et al.*, 2016). The patient should also be informed about their right to refuse the HIV test, however, refusal may only be made before the biological sample (saliva or blood) is obtained from the patient and tested for HIV antibodies (Mwisongo *et al.*, 2016). The oral health care worker must have a sound background in bioethical principles in order to prevent harm to the patient and be held legally liable (Mwisongo *et al.*, 2016). HIV has proven to be a worldwide multifaceted challenge that has had a detrimental effect on the healthcare sector, necessitating more HIV testing sites such as the dental workplace and high quality training of oral health care workers for rapid HIV testing in line with the CDC recommendations and bioethical principles (Vernillo and Caplan, 2007).

In South Africa, HIV testing guidelines recommend that testing sites warrant effective organisation and efficient management for HIV rapid testing, quality assurance programmes and protocol to ensure that tests are conducted accurately and reliably, proper guide for biological sample collection, a national HIV testing algorithm, flow process guide for interpretation of results, quality data recording tools and patient result reporting to ensure that tests are performed with a high degree of accuracy and reliability (Republic of South Africa National Department of Health, 2010; Mwisongo *et al.*, 2016). The guide emphasises that the quality of the results of the rapid HIV tests, depend on the competencies of individual testers and thus continual training for Quality System (QS) and Quality Assurance (QA) is necessary with periodic evaluation of their testing skills (Republic of South Africa National Department of Health, 2010; Mwisongo *et al.*, 2016). Due to the ease of performing the rapid HIV tests, the CDC recommends that HIV testing sites should be diversified in an effort to promote HIV prevention, reduce transmission and quickly initiate patients on antiretroviral therapy (ART) (Vernillo and Caplan, 2007). According to Glick (2005), conventional laboratory based HIV tests such as ELISA and Western Blot, are conducted by obtaining blood samples and results are only obtainable within two weeks (Glick, 2005). Glick, (2005), found that almost a third of all individuals tested, failed to return to obtain their results, thus contributing to the spread of HIV/AIDS. Rapid HIV testing ensures almost immediate results, provided that the guidelines are adhered to, thus eliminating the long waiting period which has far reaching consequences. Extension of HIV testing sites, as recommended by the CDC, gives rise to an ideal opportunity for the dental workplace to be recognised as a primary health care site offering VCT for HIV.

Figure 6: Rapid HIV testing procedure at the dental workplace



Austin (2009)

The above diagram demonstrates the procedure that oral health care workers have implemented in their own dental workplace in the United States. Siegel *et al.*, (2012), delved into the perceptions of dental personnel regarding testing for HIV in their workplaces and have found that private practice dentists expressed concerns about time constraints leading to a loss of income. However, the 20 minute time frame that the sample requires to produce a result, can be utilised by the oral health care worker to perform routine dental treatment that the patient may require, thereby

financially benefitting the oral health care worker and the patient by restoring their dental health (Austin, 2009).

2.9 The role of the oral health care worker in HIV detection

In the United States of America, the dental team is acknowledged as playing an integral role in providing primary health care services such as VCT, where up to 80% of all HIV-positive patients present with an oral manifestations (Reznik and Bednarsh, 2014). Oral health care workers are often first to recognise oral manifestations of HIV and refer patients to their medical doctor or clinic for an HIV test (Reznik and Bednarsh, 2014). However, the oral health care worker cannot be confident that the patient would obtain an HIV test (Reznik and Bednarsh, 2014), thereby increasing the morbidity and mortality rates associated with the disease. Thus the introduction of rapid HIV testing to the dental workplace would enable patients to learn their HIV status quickly, well within the timeframe of a dental routine visit (Reznik and Bednarsh, 2014).

The debilitating progressive course of HIV has transformed dramatically due to the administration of combination or highly active antiretroviral therapy (HAART), which was first introduced to Spain in 1997 (Campo *et al.*, 2012). From a European point of view, the introduction of HAART has drastically reduced the mortality rate associated with AIDS and has led to increased survival among HIV infected individuals (Campo *et al.*, 2012). However, Europeans and South Africans seem to share a common thread. Despite numerous efforts to promote the early HIV screening in Europe over the last decade, published evidence shows that there is still a significant number of individuals who do not know their HIV status (Delpierre *et al.*, 2007; Campo *et al.*, 2012). It has been estimated that a third of all HIV positive Europeans do not know that they have the HIV infection (Hamers and Phillips, 2008; Campo *et al.*, 2012) and are thus responsible for almost two thirds of all new infections (Marks, Crepaz and Janssen, 2006; Campo *et al.*, 2012).

Lack of HIV knowledge and HIV status presents with many implications for the infected individual and the health system at large. A delayed diagnosis allows for the quick progression of HIV into AIDS, which ultimately leads to an increase in morbidity and eventually mortality (Campo *et al.*, 2012). Thus, late HIV testing or no HIV testing at all, implies that the rate of HIV

transmission would be greater (Marks, Crepaz and Janssen, 2006; Gazzard *et al.*, 2008; Campo *et al.*, 2012). A lack of HIV testing among individuals, remains one of the chief challenges in reducing the progression of the disease (Campo *et al.*, 2012).

In 2006, the United States Centers for Disease Control (CDC) published recommendations for increasing the number of individuals tested and diagnosed with the infection at an early stage of the disease and for expanding and focusing on the role of healthcare professionals in eradicating the high prevalence of late diagnosis (Branson *et al.*, 2006; Hanssens, 2007). Thus, the dental clinical setting provides an ideal platform for oral health care workers to expand their role in primary health care services by detecting oral manifestations of HIV and managing the infected individual appropriately to ensure prompt initiation of medical treatment such as ART.

In South Africa, the term “Oral health care workers” in South Africa, refers to dental specialists, dentists, oral hygienists and dental therapists who are registered with the Health Professional Council of South Africa (HPCSA) (Van Wyk, 2003; Bhayat and Chikte, 2017). These oral health care workers, deliver services to the public either via the public sector such as hospital, clinics or mobile units or via the private sector such as privately owned dental practices (Bhayat and Chikte, 2017). The private sector caters for approximately 20% of the population of South Africa, while the public sector caters for the majority, accounting for 84-90% (Ramphoma, 2016; Bhayat and Chikte, 2017). However, the majority of oral health care workers operate in the private sector (Bhayat and Chikte, 2017). The number of private dental practices outweighs public dental facilities, which means that there is a good possibility of reaching out to more people that visit the oral health care workers at the private dental practices in an effort to maximise HIV testing coverage and link patients to proper linkages of HIV care.

2.10 Oral manifestations of HIV

Since the outbreak of HIV, the oral cavity has inadvertently provided a tool for monitoring of the progression of HIV by observing specific HIV lesions (Pindborg, 1989; Coogan, Greenspan and Challacombe, 2005; Campo *et al.*, 2012). Some of the most common HIV manifestations include oral candidiasis and oral hairy leukoplakia, which have been associated with low CD4+

lymphocyte counts and high plasma viral loads (Glick *et al.*, 1994; Patton *et al.*, 1999; Shiboski *et al.*, 2009; Campo *et al.*, 2012). More than 90% of all individuals with AIDS, have oral lesions associated with the infection, which is a clear indication of viral human immune system suppression (Pindborg, 1989). There are numerous HIV related oral diseases that can be diagnosed in the dental workplace. More than 75% of patients with AIDS have orofacial disease (Odell and Cawson, 2008). HIV can present as unsuspecting bacterial periodontitis in the early stages and can be mistaken for poor oral hygiene (Odell and Cawson, 2008), therefore the expertise of the oral health care worker is imperative in early detection of HIV.

Due to the high incidence of oral lesions observed in HIV/AIDS infected patients, the World Health Organization (WHO) and the European Commission Clearinghouse, developed an oral HIV lesions classification in 1992. The classification consisted of three groups with common oral HIV lesions grouped into Group 1 and consisted of: Pseudomembranous candidiasis (PMC), Erythematous candidiasis (EC), Angular cheilitis (AC), Oral hairy leukoplakia (OHL), Necrotizing ulcerative gingivitis (NUG), Necrotizing ulcerative periodontitis (NUP), Linear gingival erythema (LGE), Kaposi's sarcoma (KS) and Non-Hodgkin lymphoma (NHL) (Campo *et al.*, 2012).

Since the HIV infection is continually changing in its manifestations, the classification of these lesions had been updated by the Oral HIV/AIDS Research Alliance (OHARA), a part of the AIDS Clinical Trials Group (ACTG), which was formed in 2006 to examine and explore orofacial incidence of HIV (Campo *et al.*, 2012). The classification update correlates with the 1992 classification of the EC – Clearinghouse, however, takes into account the clinical aspects of Group 1 oral lesions (1992), as well as other common conditions frequently observed in HIV infected patients (Campo *et al.*, 2012). These include: oral papilloma, labial herpes, recurrent intraoral herpes and recurrent aphthous stomatitis (Campo *et al.*, 2012). Since the initial classification in 1992, “nonspecific ulcerations” (NOS) have merged with necrotizing ulcerative stomatitis, as well as Necrotizing Ulcerative Gingivitis and Necrotizing Ulcerative Periodontitis (Campo *et al.*, 2012). Due to evidence suggesting that oral squamous cell carcinoma (OSCC) is an increasingly common occurrence in HIV infected individuals, it has been added to the classification of orofacial lesions associated with HIV/AIDS (Campo *et al.*, 2012). Furthermore, “Salivary gland disease”

has been included into the classification into two separate categories: “salivary hypofunction” and “salivary gland swelling” as they may manifest independently in a single patient (Shiboski *et al.*, 2009; Campo *et al.*, 2012).

Multiple studies have suggested that Group 1 oral lesions may occur singularly or in multiple lesions which may be utilised as diagnostic markers by oral health care workers in screening of suspected HIV positive patients (Itula *et al.*, 1997; Bhayat, Yengopal and Rudolph, 2010; Campo *et al.*, 2012), particularly in areas with limited infrastructure and resources, or where patients are bound by the fear of stigma and discrimination associated with HIV/AIDS (Robinson, Challacombe and Sheiham, 1998; Campo *et al.*, 2012). Hence, oral health care workers play a pivotal role in the recognition of HIV, whereby an initial clinical differential diagnosis of HIV can be established and a rapid HIV test performed as confirmation.

In 2010, Bhayat, Yengopal and Rudolph (2010), conducted a study in an attempt to forecast HIV infection among dental patients who had no knowledge of their HIV status. It was found that patients presenting with NUG, had a probability of 40 times greater to have the HIV infection than patients who did not present with NUG (Bhayat, Yengopal and Rudolph, 2010). Bhayat, Yengopal and Rudolph (2010), further found that the incidence of HIV was 40% among dental patients. Among the 40% of infected patients, more than half (53%) presented with common Group 1 oral lesion, namely PMC and EC (Bhayat, Yengopal and Rudolph, 2010). The Odds Ratio (OR) of HIV infected individuals presenting with OHL was 38, as opposed to 78 in infected individuals presenting with multiple PMC and OHL lesions (Bhayat, Yengopal and Rudolph, 2010). In patients that presented with a combination of multiple HIV oral manifestations, the mean positive predictive value (PPV) and negative predictive value (NPV) was 91.7% and 61.2%, respectively (Bhayat, Yengopal and Rudolph, 2010). These comprehensive findings suggest that Group 1 oral lesions occurring singularly or in multiple combinations, can be utilised as valuable and reliable HIV screening tools, especially in areas where funding and resources are limited (Bhayat, Yengopal and Rudolph, 2010). Bhayat, Yengopal and Rudolph (2010), confirmed the usefulness of these Group 1 oral lesions as clinical markers of HIV, but mentioned that the ability to recognise and diagnose these lesions is limited by the oral health care worker’s skill and knowledge. Thus,

HIV knowledge and HIV testing training for oral health care workers is vital in preventing misdiagnosis.

Campo et al., (2012), proposed a table (Table 2) which demonstrates a list of orofacial manifestations indicative of the HIV infection, including Group 1 oral lesions, as well as recommendations of the OHARA and oral manifestations of common sexually transmitted infections (Campo *et al.*, 2012).

Table 2: Common orofacial manifestations of HIV and management

<p>Oral candidiasis (PMC; EC; AC or multifocal candidiasis *) Oral hairy leukoplakia Periodontal lesions (LGE; NG; NP) Kaposi's sarcoma Non-Hodgkin lymphoma Oral lesions suggestive of sexually transmitted infection (syphilitic chancre, gonococcal NG, lesions due to HPV such as papillomas or condylomas, etc.) Secondary tuberculosis oral lesions (granulomatous ulcers) Xerostomia (salivary hypofunction) Salivary gland swelling Long-evolving HSV lesions (> 1 month)(including labial herpes and recurrent intraoral herpes) Aphthous lesions refractory to conventional treatment</p>		<p>Option 1: Refer patient for HIV screening + Counseling: -Sexually transmitted disease clinics -Primary Care -Hospital -Qualified NGOs</p> <p>Option 2: Rapid HIV test with Oraquick Advance® + Counseling</p>
<p>(*) Assess multifocal character of lesions due to <i>Candida</i>, as well as the presence of different oral lesions in one same patient. The HIV predictive value increases considerably if there is moreover also risk behavior.</p>		

PMC: pseudomembranous candidiasis; EC: erythematous candidiasis; AC: angle cheilitis; LGE: linear gingival erythema; NG: necrotizing gingivitis; VHS: herpes simplex virus; HPV: human papillomavirus; NGO: non-government organization; NP: necrotizing periodontitis.

Campo *et al.*, (2012), p. 405

Figure 7: Clinical presentation of common oral manifestations of HIV



Campo *et al.*, (2012), p. 405

A) Pseudomembranous candidiasis (PMC) of the tongue and bilateral Angular cheilitis.

B) Pseudomembranous candidiasis (PMC) of the palate (multifocal candidiasis).

C) Erythematous candidiasis (EC).

D) Necrotizing gingivitis (NUG).

E) Oral hairy leukoplakia (right lateral border of the tongue).

F) Oral hairy leukoplakia (OHL) (left lateral border of the tongue).

(Campo *et al.*, 2012)

Figure 8: Clinical presentation of other oral lesions found in HIV positive patients



Campo *et al.*, (2012), p. 405

A) Human papilloma virus (HPV) lesion.

B) Recurrent Aphthous Stomatitis (AS) lesion on lateral border of the tongue.

C) Plasma blastic lymphoma of the palate.

D) Secondary oral tuberculosis lesion in floor of the mouth.

E) Kaposi's sarcoma (KS).

F) Oral condyloma lesion of the palate.

(Campo *et al.*, 2012)

2.11 International perceptions on HIV testing in the dental workplace

A study by Abe, Kolude and Adeyemi (2014), regarding HIV testing and the perceptions of dentists in South-western Nigeria, suggests that Nigerian dentists acknowledged the dental workplace as being an extended avenue for HIV testing and are optimistic about incorporating HIV testing into the dental setting, as well as expressed their willingness to undergo training for HIV testing. Zungu and Sanni's (2011) study showed a high level of acceptance and uptake of HIV counselling and testing among healthcare workers in designated public hospitals in KwaZulu-Natal. In addition, a study by Glick (2005), found that dental health care workers screening and testing for HIV in USA, have made a significant impact in their communities and continue to encourage other dental health care workers and organisations to help curb the HIV/AIDS epidemic. On the contrary, Abe, Kolude and Adeyemi (2014), suggested that despite the positive outlook and willingness to incorporate HIV testing into the dental workplace, there is a significantly high number of dentists who had no plans of implementing HIV testing in their dental workplace. The reasons for this being: poor understanding of rationale, lack of insurance coverage (medical aid), and most importantly that this policy should come from governing authorities and not dental care providers (Abe, Kolude and Adeyemi, 2014). Additionally, a study by Siegel *et al.*, (2012), regarding rapid HIV testing in the dental practice, suggested that dental practitioners were less likely to implement HIV testing in the dental setting due to the following reasons: liability for incorrect results, offending or upsetting patients, regarding HIV testing as a procedure not within the dental scope, low acceptance of HIV testing in dental workplace, potential negative impact on the private dental practice, inadequate reimbursement, cost and time. Patton *et al.*, (2002) and Greenberg *et al.*, (2010), identified other reasons for lack of implementation of HIV testing in the dental workplace, such as: lack of counselling skills, time constraint and patient's perception of viewing it as an activity that is unnecessary in the scope of dentistry.

An Australian study showed that the majority of the population have access to the dentist, yet an alarming 14 percent of HIV positive people were not aware of their HIV status (Santella *et al.*, 2015). Thus, Australian dentists' understanding and willingness to undertake rapid HIV testing in their dental workplace was surveyed (Santella *et al.*, 2015). The majority of the respondents were in favour of rapid HIV testing in the dental workplace, with a large number of dentists advocating

for immediate availability of rapid HIV testing (Santella *et al.*, 2015). However, many dentists, especially female, felt uncomfortable counselling a patient of a reactive (positive) result and that testing should be conducted using saliva instead of blood as the biological sample (Santella *et al.*, 2015). The willingness of dentists to extend rapid HIV testing to the dental workplace is noted, however, additional training on test administration and counselling is needed.

In a recent British study, Santella *et al.*, (2016), identified rapid HIV testing as an advancement in technology, creating an opportunity for the dental health care worker to expand their role in the diagnosis and prevention of HIV. However, constraints such as additional training, financial and logistical support are needed in the dental workplace to make testing available and accessible to the public (Santella, Conway and Watt, 2016).

Despite the oral health care worker being recognised as a key player in identifying oral manifestations of HIV (Campo *et al.*, 2012) concerns regarding implementation of rapid HIV testing at the dental workplace were raised. Critical concerns such as ethical and professional responsibility of the oral health care worker to provide HIV testing to patients, adequate HIV knowledge and HIV counselling and testing training of the oral health care worker (Campo *et al.*, 2012). Campo *et al.*, (2012), found that in Spain, there were numerous barriers facing rapid HIV testing in the dental workplace. These included, shortcomings in terms of knowledge and adequate training of rapid HIV testing among oral health care workers; fear, concern or inexperience in giving bad news to patients; a lack of interest in such testing among oral health care worker; the perception that HIV testing is not a competence of the dental surgeon; reluctance on the part of the patient to undergo such a test in a dental clinic; and economical and time issues (Campo *et al.*, 2012).

Additionally, Campo *et al.*, (2012) has raised the hypothesis that oral health care professionals within the public healthcare system are better suited to perform rapid HIV testing, particularly those working at primary health care level (public sector) (Campo *et al.*, 2012), provided adequate training in rapid HIV testing is conducted among the testers (Campo *et al.*, 2012). The study further emphasises that testing at a primary health care level (public sector) would be justified by the fact that many patients visit the oral health care worker more often than a physician (Campo *et al.*,

2012). Additionally, suggestions have been raised regarding providing HIV training at a university level for future oral health care workers (Campo *et al.*, 2012). These suggestions are well worth noting, however, Patton *et al.*, (2002), found that approximately only a third of dental schools in American universities included the legal aspects of HIV testing in their curriculum, and only 15% of the dental schools educated their dental students on referral practices of a suspected HIV infected individual. Alarmingly, more than two-thirds (63%) of the dental schools in the study, reported to not offer HIV testing (Patton *et al.*, 2002).

In light of the numerous studies and the existing information on HIV testing, the oral health care worker has a very important role to play in the early diagnosis of HIV (Glick *et al.*, 1994; Campo *et al.*, 2012; Abe, Kolude and Adeyemi, 2014; Parish *et al.*, 2017). With evidence suggesting that the majority of HIV infected people present with oral manifestations, oral health care workers need to be given the recognition and authority from oral health planners to engage in routine HIV testing in South Africa at both the public and private dental sectors.

2.12 Summary

This chapter has identified the key population group to be young women and adolescents that are most affected by HIV/AIDS in eThekweni, KwaZulu-Natal and South Africa (UNAIDS and Kharsany, 2016). The challenges encountered by the provincial and national Departments of Health are well documented in this chapter. It has also recognised the chief barriers to the low HIV testing rate in South Africa and has highlighted HIV testing policies and approaches to increase HIV testing and ensure sustainability through linkage and continuum of HIV care. Additionally, rapid HIV testing was described as the first line method of HIV testing and bio-ethical considerations of implementing it in the dental workplace were described. The literature review further explored the numerous oral manifestations of HIV and the pivotal role the oral health care worker plays in early detection of HIV and management thereof. International studies exploring the knowledge, attitudes, perceptions and practices of oral health care workers, identified opportunities and barriers to introducing HIV testing to the dental workplace. The literature review has revealed that internationally, HIV counselling and testing has been implemented with stringent policies and guidelines obtained from governing authorities such as CDC. Also, strengths,

weaknesses and challenges have been identified, whereby improvement plans and strategies can be developed to improve HIV testing. However, focus is diverted to South Africa, where there is a paucity of information regarding HIV testing in the dental workplace.

CHAPTER 3: STUDY DESIGN AND METHODOLOGY

3.1 Introduction

The design and procedures involved in the research study are outlined in this chapter together with the study population, sampling, setting, data collection methods, data capture and processing.

3.2 Study design

This was a cross-sectional, descriptive and exploratory study that assessed the knowledge, attitudes, perceptions and practices of oral health care workers regarding VCT for HIV. A combination of quantitative and qualitative data was used. The integration of the use of these study methods, allowed for a complete and synergistic use of data (Agency for Healthcare Research, 2011). This study provided an ideal opportunity for utilizing cross-sectional, descriptive and exploratory methods. Cross-sectional studies are observational, whereby the researcher measures the outcome and the exposures in the study participants at the same time, as opposed to control studies whereby participants are selected based on the outcome status or cohort studies where participants are selected based on the exposure status (Setia, 2016). The participants in a cross-sectional study are selected based on the inclusion and exclusion criteria set for the study (Setia, 2016). Once the participants have been selected for the study, the researcher follows the study to assess the exposure and the outcomes (Setia, 2016). The descriptive method utilized in this study was achieved by describing participants' responses through open-ended, closed-ended and rating-scale questions (Hale, 2009). The exploratory method was integrated into this study as well, to explore the research questions, to gain greater insight and understanding of the problem which has not been clearly defined (Research Methodology, 2018). Advantages of conducting a mixed methods study, include understanding contradictions between quantitative and qualitative results; reflects participants' point of view; encourages scholarly interaction such as multidisciplinary team research involvement; yields comprehensive data (Research Methodology, 2018). The quantitative data included a self-administered questionnaire. The qualitative data included a semi-structured interview. For the questionnaire phase of the study, the following was considered:

3.3 Study site

Study sites included eight public health institutions in eThekweni, which comprised hospitals (n=5) and clinics (n=3) and private dental practices (n=60) all of which offer dental services.

3.4 Sample population

The total study population comprised 100 oral health care workers which consisted of dental surgeons (69%; n=69), dental therapists (22%; n=22), oral hygienists (7%; n=7) and dental specialists (2%; n=2) in the eThekweni District.

3.4.1 Inclusion criteria

Oral health care workers such as dental specialists, dental surgeons, dental therapists and oral hygienists in private and public dental workplaces in the eThekweni District were included in the study.

3.4.2 Exclusion criteria

Oral health care workers not working in the eThekweni district were excluded from this study.

3.5 Sampling framework

3.5.1 Sampling technique

A purposive sampling method was utilised to obtain oral health care worker participants. Purposive sampling is a non-probability sampling technique concerned with particular characteristics of a population for participant selection (Black, 2010). This type of sampling method was utilized in order to yield an adequate and comprehensive sample size for the study.

3.5.2 Sample size

One hundred and four questionnaires were collected from voluntary participants of which one hundred (n=100) were suitable for further analysis, yielding a 100% response rate. Oral health care workers in the public sector were selected from Department of Health's recommended list of public hospitals and clinics in the eThekweni District. Considering the fact that there are fewer oral health care workers in the public dental sector than the private sector, a minimum of two participants were selected from each public institution. Oral health care workers in the private sector were equally selected according to the type of area they served, namely higher end practices, middle end practices and low end practices. Overall, n=45 public oral health care workers and n=55 private oral health care workers participated in the study.

The total number of registered private practice oral health care workers and the total number of public oral health care workers employed by the government, as well as their respective patients constituted the total sample population. According to HPCSA, there were 755 dentists, 172 dental therapists and 115 Oral Hygienists (HPCSA, 2015).

According to the statistician, the sample size of 100 oral health care workers was required to estimate HIV knowledge to within 14% with probability of 95% and baseline of 50% (Cathy Connolly, personal communication, April 2, 2015). It was assumed if two health care workers are selected from each practice, then 50 dental practices must be sampled (Cathy Connolly, personal communication, April 2, 2015). If a non-response rate of 25% is assumed, 65 dental practices must be targeted to achieve the required number of 50 practices (Cathy Connolly, personal communication, April 2, 2015). The precision of the knowledge estimates by type of oral health care worker will be to within 20% (Cathy Connolly, personal communication, April 2, 2015). Systematic sampling of dental practices from a company Medpages was used as the sampling frame (Cathy Connolly, personal communication, April 2, 2015). The precision of knowledge among patients will be within 10% (Cathy Connolly, personal communication, April 2, 2015).

3.6 Data collection tools

3.6.1 Questionnaire schedule

A self-administered questionnaire was developed for the study based on a previous study by Abe, Kolude and Adeyemi, (2014). The questionnaire included 22 items designed to assess oral health care workers' biographical information, HIV knowledge, attitudes and practices of HIV testing. The first part of the questionnaire focused on information such as gender, age group, profession, place of work, work experience and number of patients managed on a weekly basis. The second part of the questionnaire included questions pertaining to knowledge and practices with respect to HIV testing training, referral of patients with HIV associated oral lesions, commonly observed HIV oral manifestations, HIV testing at the dental workplace and knowledge of HIV testing. The third part of the questionnaire included questions related to the attitudes and perceptions of oral health care workers' regarding HIV screening in the dental workplace in the form of a Likert scale with the format of responses: 1-strongly agree, 2-agree, 3-not sure, 4-disagree and 5-strongly disagree to elicit respondents perceptions related to funding, resources, HIV testing, training and implementation of HIV testing in the dental workplace (McLeod, 2008).

3.7 Data collection process

Prior to initiating the data collection process, the researcher defended the research proposal in the presence of all the faculty members in the Discipline of Dentistry at the UKZN Westville Campus. Application for ethical clearance was consequently made to the Biomedical Research Ethics Committee. A provisional BREC approval was granted following an expedited committee review of the research proposal. An official letter granting permission to carry out research in the recommended public dental hospitals and clinics from the Health research and knowledge management of KwaZulu-Natal Department of Health was obtained. Full ethics approval was obtained from the Biomedical Research Ethics Committee of the University of KwaZulu-Natal, following amendments made by the researcher (BREC REF: BE400/17). Gate-keeper permission from the KwaZulu-Natal Department of Health was then obtained (HRKM ref 352/17). Permission letters were sent to the Chief Executive Officer (CEO) or Medical Manager of each of the

recommended hospitals and clinics in eThekweni requesting permission to carry out the study in their respective hospital or clinic premises. As part of the data collection process, the researcher visited the private and public dental workplaces in the eThekweni district. Written informed consent was obtained from oral health care workers wishing to participate in the study. The participants' signature on the consent form, served as informed consent whereby the participant acknowledged the study and completed the self-administered questionnaire willingly and voluntarily without persuasion or coercion from a second party (Ketefian, 2015). Participants remained anonymous throughout the study to ensure their privacy was respected (Ketefian, 2015). This study presented with minimal risk of clinical adverse effects, as it did not bear any clinical examination or intervention. The researcher ensured that the total sample population comprised one hundred oral health care workers (n=100) by staying at the research site, providing participants with an information sheet, explaining the purpose of the study and assisting participants to complete the questionnaire (Ketefian, 2015). The self-administered questionnaires were available in English as well as in isiZulu. The English to isiZulu translation was conducted by a translator and originality to the English version of the questionnaire was ensured by proof reading by an external translator. Questionnaires required approximately 15 minutes to complete. Completed questionnaires were placed into a sealed envelope and were collected by the researcher. The time frame for visiting the private and public dental workplace extended from August 2017 to February 2018.

3.8 Pilot study

In order to test for reliability and validity of the study, a pilot study was performed before commencement of the main study. The pilot study enabled the researcher to clarify any ambiguity in the questionnaires, identify limitations, and any difficulty in data collection which ensured that the main study was performed efficiently. The pilot study was viewed as a valuable process in research, as it ensured that the questions in the research study were understandable by the participants and allowed discussions and questions about the process of data collection (Hassan, Schattner and Mazza, 2006). The aim of the pilot study was to give feedback on difficulties participants experienced with the meaning of and replying to the questions. Discussions in the pilot

study revealed little limitations such as question structuring that were subsequently rephrased and did not affect data collection.

A sample size of 5 oral health care workers (5%) were used in the pilot study and were not included in the main study. Participants of the pilot study were purposively selected from private and public dental workplaces in the eThekweni district. The results from the pilot study assisted in restructuring and improving the data collection methods (Hassan, Schattner and Mazza, 2006). For example, questions which were similar in nature, were omitted or restructured to provide concise data.

3.9 Study site of interview with the Chief Director of eThekweni Department of Health

The interview was conducted at the Chief Director's eThekweni district office.

3.10 Sample population

The sample population consisted of n=1 Chief Director of eThekweni Department of Health.

3.10.1 Inclusion criteria

The Chief Director of the eThekweni Department of Health or Health management official at the eThekweni Department of Health was included in the study.

3.10.2 Exclusion criteria

Higher authority officials who were not managing the eThekweni Department of Health, were excluded from the study.

3.11 Interview schedule

The interview schedule focussed on the Department of Health's strategy on HIV testing, rapid HIV testing and strategic plans for promoting testing. Opportunities, challenges, policy change, funding and resources pertaining to implementation of HIV testing at the public and private dental workplace were discussed. Additionally, HIV counselling and training at undergraduate level and post graduate level for oral health care workers was on the interview schedule. The key concerns of this interview was to obtain acknowledgement from the eThekweni Department of Health that HIV counselling and testing at the dental workplace is beneficial and that funding, resources and support from the government is a possibility.

3.12 Data collection tool

Once the researcher had obtained full BREC approval and gatekeeper permission from the KwaZulu-Natal Department of Health, an invitation letter was emailed to the Chief Director of the eThekweni Department of Health explaining the research study and requesting an appointment to conduct the interview with the Director. Permission was granted and a structured face-to-face interview with the Director took place. The duration of the interview was approximately one hour and was recorded. The interview was conducted at the eThekweni Department of Health District offices, in English, and permission was obtained to record the process. The recorded interview was transcribed and typed into a readable document by the researcher that was safely stored.

3.13 Data collection process

The Chief Director of the eThekweni Department of Health was approached through the eThekweni Health District Office by submitting a formal letter requesting permission to conduct a face-to-face interview. Explicit information about the purpose and objectives of the research was provided. The approval letter from the KZN Department of Health and BREC final approval letter were attached. Prior to the commencement of the interview, informed consent, permission to record the interview was obtained. The interview with the Chief Director of the eThekweni Department of Health was one hour in duration and was audio-recorded.

3.14 Data analysis

The data obtained from the oral health care workers self-administered questionnaires, was collated, entered and recorded on the computer program EXEL and analysed using SPSS statistical software version 24.0 (SPSS Incorporated, 2004). The questionnaires parameters and participant responses were entered into the program and analysed (SPSS Incorporated, 2004). The quantitative data pertaining to the participant's biographical information, was analysed and the Fisher exact test was used to determine statistical significance. The p-value was set to less than 5% (< 0.05) to be significant. Descriptive statistics such as numerical summaries (means, standard deviations), frequency distributions and graphical presentations were used to provide questionnaire parameter information. Qualitative data regarding participants' HIV knowledge, attitudes, perceptions and practice was analysed by using a t-test to determine whether the scoring patterns per statement were significantly different per option on the questionnaire (Braun and Clarke, 2006; Encyclopedia of Research Design, 2010). Pearson Chi-Square tests were performed to show if there is any significant difference in the biographical data of the participants and their desire to implement HIV testing at the dental workplace.

The qualitative data was recorded verbatim and was analysed using thematic analysis as described by Braun and Clarke, (2006). The audio recorded interview was first transcribed verbatim, followed by a data clean-up process (Braun and Clarke, 2006; Theron, 2015). This clean-up process was imperative in identifying and correcting errors to minimize their impact on the study results, in turn adding to the validity and reliability of the study (Van Den Broeck et al., 2005). The interview transcript was then coded and analysed based on the thematic content analysis approach (Braun and Clarke, 2006; Theron, 2015). The themes included: Theme 1: Strategies for HIV testing within the Department of Health; Theme 2: HIV testing and feasibility in the dental workplace; Theme 3: Government policy on HIV testing; Sub-theme 1: Willingness to train and fund oral health care workers on HIV testing; Sub-theme 2: Challenges of implementation of HIV testing at the dental workplace; and Sub-theme 3: Extension of HIV testing to private dental practice. A code guide was then developed to support the coding process (Braun and Clarke, 2006). This form of coding allows for inductive reasoning of the emergent themes (Theron, 2015). It also

includes rules for the application of each code to ensure rigor and thoroughness (Whittemore, Chase and Mandle, 2001; Braun and Clarke, 2006; Elo and Kyngäs, 2007; Baillie, 2015).

3.15 Scientific validity and reliability of the quantitative data

Scientific validity is applicable in quantitative research and is concerned with the degree to which an assessment tool measures what it is intended to measure (Watson, 2015). The questionnaires used, were aligned to the aims and objectives of this study and this added to the internal validity (University Computing Services, 1996). The findings are limited to the eThekweni District but overall the shortcomings identified are consistent with that of studies conducted internationally such as the lack of HIV testing and counselling knowledge and training among oral health care workers and little or no HIV testing being conducted in the dental workplace. This added to the external validity of the study as the findings were relatively similar to previous studies regarding HIV testing in the dental workplace. Repeatability in quantitative study design is the ability to reproduce the same results if a particular instrument is used at different times and by different researchers (Watson, 2015). Repeatability was maintained by double checking the data during data entry and eliminating all outliers (Watson, 2015). The oral health care workers' attitudes of HIV testing in the dental workplace ($\alpha = 0.359$) indicated values below the recommended Cronbach's alpha value. Amongst the reasons for this are the following: Different interpretations among participants from different dental workplaces and inter-personal beliefs about HIV could have contributed to the inconsistent scoring. A pilot study was conducted to test the logic and coherence of the questionnaire (Hassan, Schattner and Mazza, 2006). This enhanced the reliability of the research instrument (Hassan, Schattner and Mazza, 2006).

3.16 Credibility and reliability of the qualitative data

Trustworthiness needs to be maintained when carrying out qualitative research. The Lincoln and Guba's model (1985) was used to identify criteria for establishing trustworthiness. These include: credibility, confirmability, dependability and transferability (Lincoln and Guba, 1985). It is based on determining whether the findings are accurate from the standpoint of the researcher and participants (Creswell and Creswell, 2007).

There is a need to establish if the research data is believable, trustworthy and if the researcher's conclusions are supported by the research findings (Creswell and Creswell, 2007; Austin, 2015). This can be achieved by well-defined consistent methodology, systematic and comprehensive literature review, sound ethical standards, appropriate data collection and analysis and evidence based discussion and conclusion (Creswell and Creswell, 2007; Austin, 2015). Triangulation is an important research technique used to ensure credibility (Bowen, 2008). Data source triangulation was utilised in this study, as the study consisted of a face to face interview, as well as administration of questionnaires. It consists of using more than one method of data collection to capture different dimensions on the same topic and also to cross validate the data (Carter *et al.*, 2014). Data source triangulation is concerned with collecting data from different sources like focus groups, individual interviews, community or families to have a broader dimension of the phenomenon being investigated (Carter *et al.*, 2014). Other types of triangulation include: method triangulation, theory triangulation and investigator triangulation (Carter *et al.*, 2014). In this study, theoretical triangulation was also used, whereby multiple theoretical perspectives on HIV testing at the dental workplace were utilised to extract relevant information, attitudes, perspectives, as well strengths and weaknesses of the implementation process (Carter *et al.*, 2014). A lengthy period of time was spent conducting the interview with the eThekweni Chief Director of the Department of Health, which allowed the participant to speak freely without any interruptions. The data from the structured interview provided face validity and was relatively consistent as the response was from a professional engaged in oral health service delivery. This added to the credibility of the research (Thomas and Myagilvy, 2011; Baillie, 2015). Another factor which helped to maintain credibility was the use of sampling so that confounding variables are distributed evenly within the sample and bias on the part of the researcher is eliminated (Shenton, 2004). This study made use of purposive sampling which focused only on participants possessing characteristics pertinent to the study (Etikan, 2016). Hence, in this case it was concerned with knowledge, attitudes, perspectives and practices of oral health care workers regarding HIV testing in the dental workplace. Voluntary participation of subjects and withdrawal at their own will without the need or compulsion to give clarification is primordial to maintaining credibility (Shenton, 2004; Ryan *et al.*, 2005). This aspect was clearly emphasised in the consent form. Debriefing workshops on a regular basis whereby the researcher share questions or findings with research peers who provide an additional perspective on analysis and interpretation (Moon *et al.*,

2016). This is another method to improve the rigour in a study (Baillie, 2015). In light of this statement, a member checking technique was applied whereby the researcher had presented an oral proposal defence of the study in the presence of members of the Faculty of Dentistry as part of a mandatory process before applying for ethical clearance. Faculty members aired their views, gave suggestions and recommendations to improve the study. This helped to identify the shortfalls present at the beginning from the proposal level. On-going communication with the supervisor throughout this research inevitably helped to refine the study process.

3.17 Confirmability

Confirmability refers to objectivity, that is, the potential for congruence between two or more independent people about the relevance, accuracy or meaning of the data (Polit and Beck, 2012). An audit can be utilised to ensure reliability (Polit and Beck, 2012). The data collected must represent the information participants provided (Polit and Beck, 2012). This criterion will be achieved when the findings reflect the participant's voice (Streubert and Carpenter, 1996; Polit and Beck, 2012). The audio recorded interview was used as verification (Streubert and Carpenter, 1996; Polit and Beck, 2012). In this study confirmability was maintained by doing an "audit trail" which takes into consideration the pathway from the data collection process to the data analysis where readers can track the course of the research by explicit descriptions of methodologies involved (Hadi and Jose Closs, 2016).

3.18 Dependability

Dependability refers to the stability of the data over time and conditions (Vos *et al.*, 2011; Universal Teacher, 2017). It is applied to check if the findings of an enquiry will yield the same results if it is replicated with the same participants in the same context (Polit and Beck, 2012; Universal Teacher, 2017). This can be achieved through audit where relevant supporting documents are scrutinised by an independent coder (Thomas, 2010; Polit and Beck, 2012). This study is dependable as it involved a detailed and elaborate description of the processes involved so that another researcher can have an in-depth understanding of the subject matter and use it as a guide to repeat a research. Additionally, questionnaires were precise and made use of simple, open-

and closed- ended questions, as well as Likert scale questions which provided ease of coding and analysing.

3.19 Transferability

Transferability refers to the generalisation of the data, which is, the extent to which the finding can be transferred to other settings (Trochim, 2002; Polit and Beck, 2012). In an effort to maintain transparency, a comprehensive research design, methods and literature control will be provided to the independent coder (Trochim, 2002; Vos *et al.*, 2011). The researcher will provide sufficient descriptive data in the research report so that the consumer can evaluate the applicability of the data to other context (Krefting, 1991; Trochim, 2002). One of the objectives of this study is to determine the practicality and acceptance of implementing HIV testing at the dental workplace. Therefore, transferability was critical to the application of research findings because policy change and management relies on the data, conclusions, and recommendations made from this study in order to meet the objectives of this study (Moon *et al.*, 2016).

3.20 Ethical considerations

3.20.1 Ethical clearance and permission to conduct study

Prior to obtaining Ethical clearance from the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal and KwaZulu-Natal Department of Health, the researcher enrolled and qualified for compulsory certificates in “Research Ethics Evaluation” (Module 2.1) and “South Africa.” The participant information sheet, questionnaires, interview schedules, permission letters to medical managers to conduct the study at the recommended public hospitals and clinics, permission letters to the owners of private dental practices in eThekweni; and a permission letter to the eThekweni Chief Director of the Department of Health to conduct an interview, were evaluated and approved by BREC and the KwaZulu-Natal Department of Health prior to the commencement of the study.

3.20.2 Confidentiality, beneficence and data storage

Oral health care workers were requested to sign and print their names on the questionnaires, as a means of informed consent. However, the anonymity of the participants was maintained throughout the study. Questionnaires were labelled using code numbers and no names of participants were used (SPSS Incorporated, 2004). Envelopes were provided for participants to securely seal their data collection documents (University Computing Services, 1996). The researcher kept collected data in a secure place at the University of KwaZulu-Natal. Participants were informed about data being used for publications for the benefit of other researchers by means of a clause in the informed consent letter. Completed questionnaires were immediately placed into a sealed envelope and collected by the researcher. One of the key ethical principles in conducting research, is the principle of beneficence (Ketefian, 2015). Due to the sensitive nature of HIV/AIDS, the researcher avoided causing harm to the respondents by strategically structuring the questions to avoid offending any participant (Ketefian, 2015). Participants showing signs of panic or distress, were allowed to discontinue the questionnaire and be referred for counselling at the institution or privately. However, no such event occurred during the data collection process. The completed questionnaires, voice recorder and transcripts were safely kept in a location where access to external parties were restricted. A locked cabinet in the Department of Dentistry at the University of KwaZulu-Natal was used for this purpose. The data was only accessible to the supervisor and the researcher once the statistician had analyzed and returned the data to the researcher. The data which was entered on Microsoft Excel (raw data), was electronically stored in a secured/password-protected computer and used for the sole purpose of the study. All the data was stored according to the rules and regulations specified by the University of KwaZulu-Natal which states that the data be stored for a minimum period of five years and thereafter destroyed.

3.20.3 Respect for participants, participant information sheet and informed consent

An imperative research principle, involves supplying all participants with information sheets and informed consent forms, whereby participants are able to make an informed decision regarding participation in the study (Gurayaa, London and Gurayaa, 2008). Informed consent involves disclosure, understanding and voluntariness as key elements in order to be deemed valid (Cahana

and Hurst, 2008; Kamuya, Marsh and Molyneux, 2011; Abaunza and Romero, 2014; Schofield, 2014). In keeping with the principle of justice, each participant was treated unbiasedly and fairly by the researcher and was recruited for the sole purpose of participating in the study. The study was explained in detail and adequate information was fully disclosed in the information sheet to allow participants to make a voluntary informed decision before consenting to participate (Abaunza and Romero, 2014); see Annexure 5, page 117. No penalties were imposed on the respondent should they decline to participate. Information about the nature, purpose and any potential benefits and risks of the study in a simple, concise and easily understandable language, with no jargon terms, was provided (Moreno and Arteaga, 2012; Abaunza and Romero, 2014); see Annexure 5, page 117. Participants were also informed of their time commitments and the right to withdraw from the study at any time they wish so without incurring any penalty or loss of treatment benefits to which they are entitled to (Gurayaa, London and Gurayaa, 2008). English and Isizulu translated versions were both available since there were participants who are exclusively Isizulu speaking. Undue influence or coercion as specified in the Belmont report was not used in any way and participation was entirely voluntary (Largent *et al.*, 2013). In this study and in keeping with participants' autonomy and confidentiality, the anonymity of the participants were ensured by the researcher. Questionnaires were labelled using code numbers and no names of participants were used (SPSS Incorporated, 2004). Envelopes were provided for participants to securely seal their data collection documents (University Computing Services, 1996). The researcher kept collected data in a secure lockable cabinet at the Dentistry Department at the University of KwaZulu-Natal. Participants were informed about data being used for publications for the benefit of other researchers by means of a clause in the informed consent letter; Annexure 8, page 122.

3.21 Work plan

A study proposal was developed with the guidance from the faculty supervisor and the statistician. The proposal was submitted for evaluation and ethical clearance by the University of KwaZulu-Natal and the Department of Health of KwaZulu-Natal. Data collection in consultation with the statistician commenced after obtaining ethical clearance. Data analysis commenced when the data was collected. The drafting of the thesis and professional publications began after obtaining the ethical clearance, with the intention to complete and submit the first draft of the thesis in the middle

of the year 2018. The final draft should be complete and submit at the end of the year 2018 as illustrated in the table below.

3.22 Dissemination of results

The results of this study will be communicated to participants, relevant government units, local authorities, policy makers, researchers, relevant stake-holders, colleagues, interested parties and other health professionals by report-back in meetings and presentations at conferences. The results will also be provided through publications, academic peer review national and international journals, radio, electronic and digital media resources.

3.23 Summary

This chapter explored the methodology involved in the study so as to achieve its aim and objectives and answer the research questions. It also discussed the extent to which the aspects of validity, reliability, rigour and thoroughness which are primordial for a study were established.

CHAPTER 4: MANUSCRIPT PRESENTATION

Voluntary Counselling and Testing for HIV in the dental clinical setting: Knowledge, attitudes, perceptions and practices of oral health care workers in the eThekweni District, Durban, South Africa.

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Both authors consent to publication and declare that there are no conflicting interests.

Abstract

Background. Oral health care workers are frequently at the forefront in the recognition of oral manifestations of the Human Immunodeficiency Virus (HIV) and can therefore play a sentinel role in the screening and early detection of HIV infection. It is widely accepted internationally that the knowledge, attitudes and practices of health practitioners can have a significant impact on the diagnosis and management of the disease. In South Africa, there is a paucity of published evidence that describes the knowledge, attitudes and practices of oral health care workers' regarding Voluntary Counselling and Testing (VCT) for HIV in both the public and private dental sector.

Objectives. To investigate the knowledge, attitudes, and practices of HIV testing among oral health care workers' in the public and private dental sector in the eThekweni District.

Methods. This was a descriptive and exploratory survey of 100 oral health care workers in the public and private dental workplaces in eThekweni, KwaZulu-Natal, South Africa. A self-administered questionnaire was validated and subsequently used to assess the responses from voluntary participants. Data was collated on Microsoft excel and analysed using Statistical Package for Social Sciences software (SPSS) version 24. A semi-structured interview with the Chief Director of the eThekweni Department of Health was used to assess the acceptability and practicality of implementing HIV counselling and testing at the dental workplace.

Results. One hundred questionnaires were collected from participants (n=100), yielding a 100% response rate. The majority of participants (89%) reported to have heard of rapid HIV testing. Some participants (41%) were "unsure" regarding the accuracy of rapid HIV testing. Overall, participants identified oral candidiasis (63.3%) as the most commonly observed HIV related oral manifestation. The majority of participants (82%) reported that testing for HIV did not occur at their dental workplace and nearly all participants (98%) reportedly referred patients with suspected HIV related oral lesions for Voluntary Counselling and Testing for HIV. The majority of participants (87%) indicated to have not been trained to perform HIV testing and almost all participants (94.0%) agreed that oral health care workers should be trained for HIV counselling and testing at undergraduate level. The majority of participants (87%) reported that routine HIV

testing in the dental workplace is a good idea and within the scope of dentistry (80.0%). Sixty-six participants (66%) reported to be willing to implement HIV testing to their respective dental workplace.

Conclusion. Participants reported inadequate knowledge and practice of HIV testing at the dental workplace. Overall, participants demonstrated a positive attitude to implementation of HIV testing at their dental workplace, provided that adequate training and support is available.

Introduction

The knowledge, attitudes, perceptions and practice of oral health care workers could reflect their understanding of the importance of early HIV screening at the dental workplace and, in turn, play a role in improving the HIV crisis in eThekweni. In South Africa, the prevalence of the Human immunodeficiency virus and Acquired immunodeficiency syndrome (HIV/AIDS) is an estimated 12.6% (Statistics South Africa, 2017). The province KwaZulu-Natal has the highest prevalence of HIV, contributing to 40% of the total number of HIV infected people in South Africa (Shisana *et al.*, 2014). Therefore, HIV testing is considered to be an essential component in reducing the impact of the disease (National Department of Health of South Africa, 2015) and provides an opportunity to oral health care workers to offer early HIV detection, and referral for further care and treatment for those who are infected. The oral health care worker is at the forefront of recognising oral manifestations of HIV, promoting rapid HIV testing, and curbing the detrimental effects of the disease (Campo *et al.*, 2012). Rapid HIV testing has not yet been implemented in the dental workplace in South Africa, thus creating a gap in Voluntary Counselling and Testing for HIV. There is a paucity of published evidence in South Africa to suggest that sufficient focus is placed on oral health care workers' attitudes and perceptions towards Voluntary Counselling and Testing for HIV in both the public and private dental sector.

Oral Manifestations of HIV

Oral lesions are often clinical markers of HIV and can be used to predict the progression of HIV to AIDS (Coogan, Greenspan and Challacombe, 2005; Berberi and Aoun, 2017). Considering the fact that oral health care workers are often first to identify suspected HIV oral manifestations (Glick *et al.*, 1994; Campo *et al.*, 2012; Reznik and Bednarsh, 2014), early opportunistic HIV

testing is essential in recognition of HIV progression, evaluation and management of HIV infected patients (Glick et al., 1994). A South African study by Arendorf *et al.*, (1998), found that one or more oral lesions were present in 60.4% of HIV positive individuals. Several cardinal oral manifestations have been identified locally and internationally (Coogan, Greenspan and Challacombe, 2005). Lesions such as: oral candidiasis, necrotizing ulcerative periodontitis, necrotizing ulcerative gingivitis, oral hairy leukoplakia, Kaposi sarcoma, linear gingival erythema and non-Hodgkin lymphoma are strongly linked with HIV and AIDS (Coogan, Greenspan and Challacombe, 2005). These lesions are reported to present in up to 50% of HIV infected individuals and in up to 80% of individuals with AIDS (Coogan, Greenspan and Challacombe, 2005).

International perspectives

Numerous international studies have explored the knowledge, attitudes, perceptions and practices of oral health care workers and Voluntary Counselling and Testing for HIV. A study by Abe, Kolude and Adeyemi (2014), regarding HIV testing and the perceptions of dentists in South-western Nigeria, suggests that Nigerian dentists are optimistic about incorporating HIV testing into the dental setting, as well as expressed their willingness to undergo training for HIV testing. A study by Glick (2005), found that oral health care workers screening and testing for HIV in United States of America, have made a significant positive impact in their communities. On the contrary, Abe, Kolude and Adeyemi (2014), suggested that despite the positive outlook and willingness to incorporate HIV testing into the dental workplace, there is a significantly high number of dentists who had no plans of implementing HIV testing in their dental workplace. The reasons for this being: poor understanding of rationale, lack of reimbursement and most importantly that policy should come from governing health authorities and not oral health care workers (Abe, Kolude and Adeyemi, 2014).

Methods

This was a cross-sectional, descriptive and exploratory study that assessed the knowledge, attitudes and practice of oral health care workers regarding VCT for HIV. One hundred and four questionnaires were purposively sampled and collected from voluntary participants of which one hundred (n=100) were suitable for further analysis, yielding a 100% response rate. Study sites included eight public health institutions in eThekweni, which comprised of hospitals (n=5) and

clinics (n=3) and private dental practices (n=60), all of which offer dental services. The total study population comprised 100 oral health care workers which consisted of dental surgeons (n=69; 69%), dental therapists (n=22; 22%), oral hygienists (n=7; 7%) and dental specialists (n=2; 2%) in the eThekweni District. Oral health care workers in the public sector were selected from Department of Health’s recommended list of public hospitals and clinics in the eThekweni District. Considering the fact that there are fewer oral health care workers in the public dental sector than the private sector, a minimum of two participants were selected from each public institution. Oral health care workers in the private sector were equally selected according to the type of area they served, namely higher end practices, middle end practices and low end practices (Table 1). Overall, n=45 public oral health care workers and n=55 private oral health care workers participated in the study.

Table 1: Number of public and private oral health care workers

Oral health care workers employed in the public sector	Oral health care workers employed in the private sector
n=45, 45%	n=55, 55%

The research instrument comprised a self-administered questionnaire which was validated by means of a pilot study which included (n=5) oral health workers from eThekweni to clarify any ambiguity in the questionnaire and assess the responses from voluntary participants. The questionnaire included 22 items designed to assess oral health care workers’ biographical information, HIV knowledge, attitudes and practices of HIV testing. The first part of the questionnaire focused on information such as gender, age group, profession, place of work, work experience and number of patients managed on a weekly basis. The second part of the questionnaire included questions pertaining to knowledge and practices with respect to HIV testing training, referral of patients with HIV associated oral lesions, commonly observed HIV oral manifestations, HIV testing at the dental workplace and knowledge of HIV testing. The third part of the questionnaire included questions related to the attitudes and perceptions of oral health care workers’ regarding HIV screening in the dental workplace in the form of a Likert scale with the format of responses: 1-strongly agree, 2-agree, 3-not sure, 4-disagree and 5-strongly disagree to

elicit respondents perceptions related to funding, resources, HIV testing, training and implementation of HIV testing in the dental workplace. The questionnaire consisted of closed ended and open-ended questions. A face to face semi-structured interview was conducted with the Chief Director of the eThekweni Department of Health at a place and time suggested by the interviewee. The interview was one hour in duration and the interview schedule focussed on the high prevalence of HIV in KwaZulu-Natal, the need for extending the HIV testing sites to the dental workplace, need for quality HIV testing training at tertiary level for all health care providers, resources and support required for such a change and government funding. The interview was audio-recorded.

The study was granted ethical clearance by the Biomedical Research Ethics Committee at the University of KwaZulu-Natal (BREC REF: BE400/17). Participants were invited to partake in the study and written informed consent was obtained. Study participants were informed that the study was voluntary and that participants were free to withdraw from the study at any stage, without any negative consequences. The questionnaire was administered in the English language and isiZulu to ensure that all the participants were comfortable with the language. All other ethical issues, such as confidentiality and anonymity, were maintained. Data was analysed using SPSS version 24.0 (IBM Corp., USA). Univariate descriptive statistics, such as frequency and mean distribution, were conducted for all variables. The responses to the open-ended questions were grouped and emergent themes were examined and compared for possible associations. Inferential techniques included Pearson's χ^2 test to assess a possible relationship between the independent variables (gender, age group, profession of the oral health care worker, place of work, years of work experience and number of patients seen on weekly basis) and the dependent variables (choice to implement rapid HIV testing in the dental workplace). A p-value < 0.05 was considered to be statistically significant.

Reliability of questionnaire

The Cronbach's alpha score for all items that constituted the questionnaire is reflected in Table 2. The positive perceptions of HIV related testing attitudes ($\alpha= 0.752$) and negative perceptions of HIV related testing attitudes ($\alpha=0.733$) exceeds the recommended Cronbach's alpha value. This indicates a degree of acceptable and consistent scoring for the various sections of the research.

The oral health care workers' attitudes of HIV testing in the dental workplace ($\alpha = 0.359$) indicated values below the recommended Cronbach's alpha value. Amongst the reasons for this are the following: Different interpretations among participants from different dental workplaces and inter-personal beliefs about HIV could have contributed to the inconsistent scoring.

Table 2: Cronbach's alpha

	Number of Items	Cronbach's Alpha
Positive Perceptions of HIV Related Testing Attitudes	6	0.752
Negative Perceptions of HIV Related Testing Attitudes	6	0.733
Attitudes and Perceptions of HIV Testing in the Dental Workplace	9	0.359

The qualitative data was recorded and was analysed using thematic analysis as described by (Braun and Clarke, 2006). The audio recorded interview was first transcribed verbatim by the researcher, followed by a data clean-up process (Braun and Clarke, 2006; Theron, 2015). The interview transcript was then coded and analysed based on the thematic content analysis approach (Braun and Clarke, 2006; Theron, 2015). A code guide was then developed to support the coding process. This form of coding allows for inductive reasoning of the emergent themes (Theron, 2015). It also includes rules for the application of each code to ensure rigor and thoroughness (Whittemore, Chase and Mandle, 2001; Braun and Clarke, 2006; Elo and Kyngäs, 2007; Baillie, 2015).

Results

The sample comprised Dental Surgeons (69%), which was followed by Dental Therapists (22%), Oral Hygienists (7%), and Dental Specialists (2%). Overall, the majority of the participants (31.0%) were within the age distribution of 41 > years old and more participants were male (54%). More than half of the participants reported to work at private dental practices (57.0%), whilst other places of work included the dental department in public hospitals (34.0%), dental department in public clinics (6.0%) and some oral health care workers indicated to work at mobile clinics (3.0%). The Chi-Pearson Test (Table 3) revealed no statistical significant differences with respect to gender, age group, profession of the oral health care provider and the option to implement HIV testing ($p > 0.05$). The attitudes and perspectives regarding Voluntary Counselling and Testing for HIV testing at the dental workplace irrespective of the gender, age group and profession was

similar. With regards to the place of work of the participants, there were statistical significant differences ($p < 0.05$). It was reported that participants (45.6%) from the private dental practice were against the implementation of HIV testing at the dental workplace when compared to other oral health care workers' place of work.

Table 3: Relationship between biographical data and option to implement HIV testing to the dental workplace

Biographical data		Number	Would you implement HIV testing in your dental workplace?		P-value
			Yes	No	
Gender	Male	54	32 (59.3%)	22 (40.7%)	0.142
	Female	46	34 (73.9%)	12 (26.1%)	
Age group	23-28 years	24	17 (70.8%)	7 (29.2%)	0.965
	29-34 years	27	17 (63.0%)	10 (37.0%)	
	35-40 years	18	12 (66.7%)	6 (33.3%)	
	41 > years	31	20 (64.5%)	11 (35.5%)	
Profession	Dental therapist	22	18 (81.8%)	4 (18.2%)	0.053
	Dental surgeon	69	43 (62.3%)	26 (37.7%)	
	Oral hygienist	7	5 (71.4%)	2 (28.6%)	
	Dental specialist	2	0 (0.0%)	2 (100.0%)	
Place of work	Private Dental practice	57	31 (54.4%)	26 (45.6%)	0.032
	Dental department in public hospital	34	27 (79.4%)	7 (20.6%)	
	Dental department in public clinic	6	5 (83.3%)	1 (16.7%)	
	Other (Mobile clinics)	3	3 (100.0%)	0 (0.0%)	
Years of experience	1-5 years	28	20 (71.4%)	8 (28.6%)	0.363
	6-10 years	24	13 (54.2%)	11 (45.8%)	
	11-15 years	15	12 (80.0%)	3 (20.0%)	
	>15 years	33	21 (63.6%)	12 (36.4%)	
Number of patients seen on weekly basis	<50	38	24 (63.2%)	14 (36.8%)	0.516
	50-100	41	26 (63.4%)	15 (36.6%)	
	101-150	12	8 (66.7%)	4 (33.3%)	
	>150	9	8 (88.9%)	1 (11.1%)	

Knowledge of HIV testing

Almost all participants (99%) indicated that HIV testing can be performed by obtaining the patient's blood sample ($p < 0.001$). However, almost 37% of participants incorrectly indicated that HIV testing cannot be performed by obtaining saliva samples from patients. Additionally, 30% of

participants were “unsure” whether HIV can be tested by obtaining urine sample from the patients, whilst 54% of participants reported to be “unsure” of other methods of HIV testing (Table 4).

Table 4: Knowledge of HIV testing

HIV can be tested by obtaining the patient's:	No.	Knowledge			Mean	Std.	T-test Value	P-value
		Yes	No	Unsure				
Blood	100	99%	1%	0.0%	1.01	0.100	101.000	0.000
Saliva sample	100	47%	37%	16%	1.69	0.734	23.013	0.000
Urine sample	100	3%	67%	30%	2.27	0.510	44.544	0.000
Other	100	6%	40%	54%	2.48	0.610	40.589	0.000

Knowledge of rapid HIV testing

Similarly, participants’ knowledge of rapid HIV testing was statistically significantly different ($p < 0.001$). The majority of the participants (89%) reported to have heard of rapid HIV testing. However, some participants (41%) were “unsure” whether rapid HIV testing is as accurate as the ELISA and Western blot testing methods and 37.0% of the participants incorrectly reported that rapid HIV testing is not as accurate as the ELISA and Western Blot methods (Table 5).

Table 5: Knowledge of rapid HIV testing

Questions	No.	Knowledge			P-value
		Yes	No	Unsure	
Cheaper than the conventional testing?	100	81.0%	9.0%	10.0%	0.000
Quicker than the conventional testing?	100	92.0%	3.0%	5.0%	0.000
Less invasive?	100	74.0%	12.0%	14.0%	0.000
Useful in areas with minimal infrastructure?	100	84.0%	7.0%	9.0%	0.000
As accurate as ELISA and Western blot?	100	22.0%	37.0%	41.0%	0.000

HIV Training

It was reported that the majority of the participants (83.0%) had not received any form of HIV counselling and testing training. Almost all participants (94.0%) supported the idea that oral health care workers should be trained at undergraduate level and many participants (82%) indicated to be willing to undergo HIV counselling and testing training. However, some participants (18%) reported not wanting to undergo HIV training, for reasons such as nearing retirement (11.1%), some did not think it is necessary in private practice (11.1%), whilst others were not interested in the training or felt it is not a priority at the moment (5.6%).

HIV oral manifestations

The majority of the participants (68%) indicated to manage <5 patients with possible HIV associated oral lesions on a monthly basis. Participants reported: Oral candidiasis (63.3%), Necrotising Ulcerative Periodontitis (57.1%) and Necrotising Ulcerative Gingivitis (51.0%) as the most commonly observed HIV oral manifestation in patients presenting to their dental workplace.

HIV testing and patient referral

Eighty-two participants (82%) do not test for HIV at their dental workplace and nearly all participants (98%) reported to have referred patients with suspected HIV related oral lesions for further confirmatory tests. Many participants (83%) indicated to not having sufficient staff to carry out rapid HIV testing as well as pre-and post-testing counselling for HIV.

Positive attitudes and perceptions regarding Voluntary Counselling and Testing for HIV in the dental workplace (Table 6)

Highly statistical significant differences were noted with all statements ($p < 0.001$). The majority of participants (87%) reported that opportunistic routine HIV testing in the dental workplace is a good idea. The majority of participants (66.0%) reported to be willing to implement HIV testing in their dental workplace and 80% of participants reported that HIV testing is within the scope of dentistry. Sixty-seven participants (67%) reported that an HIV testing policy in the dental workplace is required before testing can commence. The majority of participants (83%) reported that opportunistic HIV testing in the dental workplace will bring about HIV awareness and eliminate shame and rejection associated with HIV/AIDS. Participants (83%) reported that HIV

testing in the dental workplace is not a waste of medical resources and the majority of participants (93%) agreed that opportunistic HIV testing in dental workplace may increase the chance of patients seeking medical attention and living a healthier life. Almost all participants (98.0%) agreed that HIV testing in the dental workplace should be performed, provided oral health care workers and staff are adequately trained. Additionally, the majority of participants (76%) were comfortable treating a suspected HIV positive patient and 81% of the participants did not feel at risk for contracting the disease. Participants reported early detection and effective management of HIV (28.9%), awareness and knowledge of HIV status (24.4%) and risks of treating undiagnosed HIV positive individuals (6.7%) as reasons for being willing to implement HIV testing to the dental workplace.

The majority of participants (87%) that are optimistic about routine HIV testing at the dental workplace, share similar sentiments to one of the participants who expressed their view in an open-ended question regarding routine HIV testing at the dental workplace:

“More people need to know their HIV status irrespective of the result. If this is possible at the dental workplace, then it becomes easier to do. There is usually a stigma attached to HIV testing. If it becomes a routine procedure, there is less of a stigma attached. It would also benefit reducing the spread of HIV and lead to early treatment if the patient is positive” - (Oral health care worker participant).

Table 6: Positive perceptions on routine HIV testing at the dental workplace

Early detection and effective management of HIV 13 (28.9%)	Awareness and knowledge of HIV status 10 (22.2%)	Risks of treating undiagnosed HIV positive individuals 3 (6.7%)
<ol style="list-style-type: none"> 1. Many oral HIV manifestations are seen by dentists especially in the public sector and early diagnosis is very important for the patient and all the people around them. It could assist the medical community with improving awareness and helping more people know their status. It could help communities that are not able to be seen by medical staff due to busy clinics and limited resources. 2. Testing is very useful for the welfare of the patient. The broadest spectrum of facilities should offer testing. 3. It will assist in better treatment of the patient. Patients can be counselled at the earliest and treatment can be given. 4. Patients will know their status and how to look after themselves better. 5. Easy access for patients-for those who only access dental services. Provides early intervention to patients. 6. More testing sites, more people tested. Can seek medication sooner if necessary. 	<ol style="list-style-type: none"> 1. The incidence of HIV in SA is among the highest in the world. Bearing that in mind, routine HIV testing should as important as checking for blood pressure and blood glucose levels. 2. It is good knowing the patients status, however, we were trained to treat every patient as if they are HIV+. 3. A large number of patients access dental services only and many of them do not know their status. 4. Any means to increase awareness and HIV testing is good. Dentists can also be exposed to blood, so knowing a patient’s status is important. 5. HIV is a major problem. Patients can get tested quicker and know their status; thereby reducing the negative impact on the country. 6. Patients can become aware of their status and can start treatment sooner. 7. It would enable more people to know their status and act accordingly. 8. Routine testing also decreases the risk of stigma and discrimination. 	<ol style="list-style-type: none"> 1. Due to exposure to potential contaminations and high number of HIV positive patients, testing is prudent as staff are always aware of risk, even with the use of personal protective equipment and need reassurance. 2. There are times where oral health care workers do get an injury eg) forceps penetrates through the gloves and lacerates the skin and we are so busy that we do not test, thinking it is just a superficial wound. Basically time is an issue. 3. Definitely, we as health care workers are always at risk.

Negative attitudes and perceptions regarding Voluntary Counselling and Testing for HIV in the dental workplace

The majority of participants (91%) indicated that they do not have pre- and post-test HIV counselling and testing skills and many participants (87%) reported that oral health care workers and dental staff are not trained at undergraduate level to perform HIV testing. It was reported that participants (45.6%) from the private dental practice were against the implementation of HIV testing at the dental workplace when compared to other oral health care workers' place of work. Many participants (73%) indicated to not wanting to implement HIV testing in their dental workplace due to inadequate or no remuneration from government or medical aid schemes. Other reasons reported by participants (34%) for not wanting to implement HIV testing in the dental workplace include: lack of suitability of HIV testing in the private practice due to time constraints and untrained staff (26.5%), the sensitive nature of HIV as well as fear of stigmatisation by patients (5.9%), no official HIV testing policy for the dental workplace (2.9%), and regarding rapid HIV testing in the dental workplace as an additional stress (2.9%).

Interview with Chief Director of eThekweni Department of Health

The following themes emerged from the interview:

Theme 1: Strategies for HIV testing within the Department of Health

“The main thrust of the project was to increase HIV testing so that we reach our UN goals for the 90:90:90 strategy as well as increase the number of people who know their status, are on treatment and are virally suppressed.”

Theme 2: HIV testing and feasibility in the dental workplace

“We need (HIV testing) at a community level, at health facility level or at private practitioner level, but more importantly, at all service points in our health facility. So it is quite crucial that we cover every service point, be it medical, surgical or rehabilitative.”

The director further noted the inactive participation of the dental workplace in providing VCT to dental patients.

“For when it comes to dental services, you see a lot of oral HIV manifestations, so it is really a gap in service delivery, a major gap if we can’t provide HIV testing for people accessing dental services.”

In terms of the feasibility of HIV testing at the dental workplace, the director reported that:

... “in terms of feasibility, I see it as something that can be done very easily. Because I want to believe whenever any client accesses health services, you have got to do some health screening. You have to screen the person holistically in terms of their medical profile.”

The director remained positive that HIV testing in specialised services such the dental workplace, is achievable. According to the director:

“So it is something that could be done. And the missed opportunities are where we have not been providing HIV screening and testing in certain services because we regard them as specialised services and one of those are dental services. So we need to target the dental sector because there are people that are generally not sick, who never go to a clinic, who never go to a hospital, but they would have a dental problem. So those people by and large, have missed the opportunity to be tested for HIV, so therefore we need to target that service in order to increase coverage in terms of HIV testing.”

Theme 3: Government policy on HIV testing

According to the director, policy change was not a limiting factor to HIV testing at the dental workplace, but rather the processes of implementing the policy. The director reported that the existing HIV testing policy, stipulates to cover the whole population. Hence, the director was concerned on how to effectively implement the policies. One notable aspect was how the Department of Health can ensure access for dental patients to HIV testing. Excerpt from the director:

..... *“Not a policy change because the policy says we have to cover the whole population, but we would have to look at our processes rather than policy. We have to look at implementation: how do we ensure access for dental patients to HIV testing which either would mean we have got to train our dental staff on HIV counselling and testing, which means for instance, oral hygienists, those are the first we would have to target, but even dental therapists and dentists.”*

The director strongly advocated for the training of oral hygienists, as the director states:

“But if we really wanted to improve in terms of HIV screening, let’s start with the oral hygienists. Oral hygienists must be trained for HIV testing and counselling because I want to believe they are the first contact care for patients.”

In situations where there are no dental assistants to work directly with the dentist, the director recommended training of the dentist to carry out the task of HIV testing. According to the director:

“Some places may not have a dental assistant but the dentist present. That is what we call provider initiated counselling and testing. The dentist must be able to counsel and if it be, also test. But if we wanted to increase access, let’s start with the sub categories: oral hygienists and dental assistants. Let them provide that care as part of first line contact care and screening of dental patients.”

Sub-theme 1: Willingness to train and fund oral health care workers on HIV testing

The director was asked whether the Department of Health is willing to invest in such a project in terms of funding of the rapid HIV testing kits and for training of oral care workers. It emerged that HIV counselling and testing programs to train health workers is already funded. The director stated that:

“The HIV testing kits are available at every facility. The training is available and can be completed quickly over a week. We train every health care worker. For instance, in my district, if the head of dental services in the district says I would like to train all my oral hygienists and dental assistants

on HIV counselling and testing, all I have to do is co-ordinate the training, bring the group into training and monitor them. I would also provide you with the protocol guidelines on how to go about it and provide you with the HIV testing kits. So that is why I am saying it is not a policy issue.”

Sub-theme 2: Challenges of implementation of HIV testing at the dental workplace

The importance of data gathering of HIV information from the dental workplace was noted by the director as a case to strengthen the argument of HIV testing at the dental workplace. However, it was worth noting that the HIV statistics data gathering process may become a constraint for implementing HIV testing at the dental workplace. The excerpt from the director’s response is noted below:

“One of the challenges we see with conducting this type of service, is co-ordinating and collecting the data. You might find that the testing is done, but there are challenges of data flow and submission. You would find that there is expenditure on the HIV test kits but no outputs in terms of numbers. Not because the work is not being done, but we need this core data to be centrally co-ordinated so that we can use it for planning and resourcing.”

Sub-theme 3: Extension of HIV testing to private dental practice

From the interview with the director, it emerged that a partnership agreement can be entered into with the Department of Health and the private dental practice. It was also gathered from the interview that no remuneration and monetary compensation will be given to the private clinic. According to the director:

“If a private practitioner says I want to screen all my patients for HIV, we would enter into a partnership with the private practitioner to say here you are, we give you the HIV testing kits. All you have to do is provide us with data: the number of patients you have tested and submit. Say for instance, if the private practitioner’s rooms are next to a particular clinic or hospital, that

institution will provide the private practitioners with the HIV testing kits and all they ask for is that they submit their data through the clinic and that will improve our coverage as well.”

In terms of remuneration, the director firmly stated that:

“No there would not be any remuneration. It is a trade off in terms of benefits because patients will be able to have dental treatment and be offered HIV testing without going to the clinic and spending four hours there.”

From the director’s point of view, testing for HIV at the private dental practice will have other benefits in terms of service delivery and public recognition. The director emphasises that:

“It improves service delivery and also increases the number of patients that the dental practices see, because he/she is not only providing one service. The word would go around to say if you go there, they also test you for HIV so that patients will know their HIV status and then be linked up for initiation of treatment. So THAT doctor benefits from providing a more comprehensive service and can get more clients at the same time. He/ She can also build a very crucial relationship with the Department of Health where there will be linkages and the patient will not be lost after he/she is tested. Therefore the private dental practitioner will be offering services which is more enhanced, more comprehensive and beneficial to the community.”

Discussion

Knowledge and Practice

The majority of participants (89%) reported to have heard of rapid HIV testing, however, many participants reported to be “unsure” regarding their HIV testing knowledge. Additionally, only 18% of participants have indicated to perform rapid HIV testing in their dental workplace, despite the high prevalence of oral manifestations of HIV observed in patients. These findings are similar to a study by Gumede (2017), where the author explored knowledge, attitudes, perceptions and practices of health care users towards rapid HIV testing at selected gateway clinics in eThekweni.

That study indicated that the majority of participants had heard of rapid HIV testing, yet only a few participants reported to have used rapid HIV testing (Gumede, 2017).

Participants in this study reported that the referral rate of suspected HIV infected individuals was high (98%). Participants recognised their limitations in HIV testing skills and almost all participants (94%) advocated for HIV counselling and testing training to be included in undergraduate curricula. This finding is similar to a study conducted by Ramphoma and Naidoo (2014), which investigated the knowledge, attitudes, perceptions and practices of oral health care workers in Lesotho regarding the management of patients with oral manifestations of HIV/AIDS. Ramphoma and Naidoo (2014), found that very few dentists reported to have comprehensive knowledge of oral HIV lesions and nearly all participants expressed the need for further knowledge and training in this regard.

Participants in this study reported oral candidiasis as the most common oral HIV lesion observed in their patients, which is similar to several other studies (Darling, Arendorf and Samaranayake, 1992; WHO Collaborating Centre on Oral Manifestations of the Immunodeficiency Virus, 1993; Rudolph and Ogunbodede, 1999; Ramphoma and Naidoo, 2014).

Participants' attitudes regarding VCT in the dental workplace

The majority of participants (87%) reported that routine HIV testing in the dental workplace is a good idea and 80% of the participants perceived HIV testing to be within the scope of dentistry and thus should be practiced. Additionally, the majority of participants (66%) reported to be willing to implement HIV testing in their dental workplace. This finding is well worth noting, as it creates an opportunity for all oral health care workers in eThekweni to be recognised as key players in the early diagnosis of HIV (Campo *et al.*, 2012) and in turn improve the health system in South Africa. The reported positive attitudes and optimism expressed among oral health care workers regarding HIV testing in the dental workplace, are similar to those cited in previous studies (Zungu and Sanni, 2011; Abe, Kolude and Adeyemi, 2014; Santella *et al.*, 2015). The results have indicated that the majority of participants have recognised the benefits of opportunistic HIV testing in the dental workplace, as oral health care workers have reported to be comfortable treating suspected HIV positive individuals and many participants want to bring about HIV awareness and

eliminate shame and rejection associated with HIV/AIDS. Conversely, although HIV testing in the dental workplace has been reported as an essential component in early detection of HIV, the results have revealed barriers to HIV testing in the dental workplace. These include: lack of HIV counselling and testing training among oral health care workers and staff, lack of remuneration, lack of guidance from the Department of Health, compromised patient confidentiality, liability for false results and a lack of resources and time. Some participants (45.6%) from the private dental practices in eThekweni, indicated to be against HIV testing in the dental workplace when compared to other oral health care workers' place of work. Similarly, international studies have reported that oral health care workers from the private dental sector were less likely to implement HIV testing in the dental workplace due to: lack of counselling skills, resources, time constraints and perception of viewing it as an activity that is unnecessary in the scope of dentistry (Patton *et al.*, 2002; Greenberg *et al.*, 2010). Furthermore, Abe, Kolude and Adeyemi, (2014) reported reasons for the lack of interest in HIV testing in the dental workplace: poor understanding of rationale of rapid HIV testing, lack of insurance coverage (medical aid), and most importantly that this policy should come from governing authorities and not oral health care workers.

Interview with Chief Director of eThekweni Department of Health

With the majority of participants (87%) supporting routine HIV testing at the dental workplace and 94% of participants advocating for HIV counselling and testing training at undergraduate level, a gateway has been created for oral health care workers in eThekweni to provide VCT at the dental workplace. Although the feasibility of implementing this in terms of logistics, resources and funding presented as limiting factors, the director has reported that HIV testing is very feasible at the dental workplace. Despite concerns regarding data collection and coordination particularly in the private dental practice, it emerged that effective partnership with the Department of Health can help address the challenges of data management. A study by Hutchinson *et al.*, (2012), investigated the feasibility of implementing rapid oral fluid HIV testing in an Urban University dental clinic and results were fairly consistent with this study. Hutchinson *et al.*, (2012), found that participants indicated relatively high levels of acceptability of rapid HIV testing and barriers and facilitators of rapid HIV testing were identified as: scope of practice, practice enhancement, skills/knowledge/training factors, patient reactions and logistical issues. Similarly, Tabb *et al.*, (2017) assessed the acceptability and feasibility of HIV testing and counselling among patients

and staff at a hospital in Ghana and found that HIV testing was accepted by both patients and staff, however, incomplete HIV knowledge, logistical and resource issues remain a challenge.

Time and resources are commodities especially for the private oral health care worker, thus a lack of remuneration for offering VCT at the dental workplace is likely to lead to fewer private oral health care workers implementing VCT. This assumption is consistent with the results of this study, as 45.6% of participants from the private dental practice were not keen on implementing VCT for reasons such as lack of remuneration (73%) and untrained staff (26.5%). The director, however, has provided reassurance that HIV counselling and testing training and rapid HIV testing kits are funded and available. Additionally, the director has outlined positive outcomes of implementing HIV testing in the private practice, such as providing comprehensive service delivery which will in turn lead to public recognition and possibly increase in patient base. While the director has highlighted the positive aspects and good possibility of implementing VCT in the dental workplace, some of the challenges of HIV testing at the dental workplace needs to be reviewed. This research intends to urge the Department of Health to formulate a policy to encourage the oral health care workers in both the public and private dental workplaces to participate as active partners in HIV testing. Furthermore, the Department of Health is a regulator of the private sector, therefore, it is worth understanding how policy and planning within the health system takes into account the possibility of extending HIV testing into private dental practices.

Study limitations

The study provided valuable insight into oral health care workers' knowledge, attitudes and practice of HIV testing, but some limitations were noted. The study focused exclusively on oral health care workers in the eThekweni district. More research is required on a larger scale to further explore the knowledge, attitudes, perceptions and practices of oral health care workers on a national level. This includes understanding the interplay between oral health care workers' HIV knowledge and training and social and cultural norms that influence oral health care workers' attitudes and perceptions towards HIV testing. The smaller study population among the public oral health care workers may be attributed to the fact that some oral health care workers work in mobile clinics and not in fixed clinics or hospitals, thereby possibly resulting in a skewed sample size. Additionally, the majority of oral health care workers in South Africa are located in the private sector (Bhayat and Chikte, 2017). This study relied on self-reporting information during the

interview phase where selective memory, telescoping, attribution or exaggeration could present as bias (University of Southern California, 2018). Over-reporting could have also been present with regards to oral health care workers' HIV testing practices. This observation is consistent with findings by Singh and Pottapinjara (2017) and Ahamed *et al.*, (2015) which found that self-reported data could be over or under-reported owing to social desirability.

Conclusion

The results indicate that oral health care workers' HIV testing knowledge and practice of HIV testing is inadequate. However, oral health care workers have recognised their limitations with regards to lack of knowledge and thus advocate for HIV counselling and testing training, particularly at undergraduate level. Oral health care workers expressed positive attitudes and willingness to implement HIV testing to the dental workplace, provided an HIV testing policy specific to the dental sector is implemented and guided by the Department of Health. Despite the optimism and positive outlook expressed among oral health care workers regarding Voluntary Counselling and Testing for HIV at the dental workplace, logistical barriers have been identified. Therefore oral health planning is required to take into account the pre-existing attitudes and HIV testing practices of oral health care workers and provide greater support for oral health workers. This could include HIV counselling and testing training at undergraduate level, continuous refresher courses for existing oral health care workers and guidelines for HIV testing in the dental workplace.

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References

- Abe, E., Kolude, B. and Adeyemi, B. (2014) 'HIV testing in dental practice: perception and attitude of dentists in Southwestern Nigeria', *African Journal of Medicine and Medical Sciences*, 43(Suppl 1), pp. 201–208. doi: 10.1016/j.coviro.2015.09.001.Human.
- Ahamed, S. *et al.* (2015) 'Evaluation of the oral health knowledge, attitude and behavior of the preclinical and clinical dental students', *Journal of International Oral Health*, 7(6), pp. 65–70. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4479777/pdf/JIOH-7-65.pdf>.
- Arendorf, T. *et al.* (1998) 'Oral manifestations of HIV infection in 600 South African patients', *Journal of Oral Pathology & Medicine - Wiley Online Library*, 24(4), pp. 176–179. doi: <https://doi.org/10.1111/j.1600-0714.1998.tb01936.x>.
- Baillie, L. (2015) 'Promoting and evaluating scientific rigour in qualitative research', *Nursing Standard*, 29(46), pp. 36–42. doi: 10.7748/ns.29.46.36.e8830.
- Berberi, A. and Aoun, G. (2017) 'Oral lesions associated with human immunodeficiency virus in 75 adult patients: a clinical study', *Journal of the Korean Association of Oral and Maxillofacial Surgeons*, 43(6), p. 388. doi: 10.5125/jkaoms.2017.43.6.388.
- Bhayat, A. and Chikte, U. (2017) 'The changing demographic profile of dentists and dental specialists in South Africa: 2002–2015', *International Dental Journal*, 68(2), pp. 91–96. doi: 10.1111/idj.12332.
- Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, 3(2), pp. 77–101. doi: 10.1191/1478088706qp063oa.
- Campo, J. *et al.* (2012) 'Role of the dental surgeon in the early detection of adults with underlying HIV infection/AIDS', *Medicina Oral, Patologia Oral y Cirugia Bucal*, 17(3). doi: 10.4317/medoral.17527.
- Coogan, M. M., Greenspan, J. and Challacombe, S. J. (2005) 'Oral lesions in infection with human immunodeficiency virus', *Bulletin of the World Health Organization*, 83(9), pp. 700–706. doi: /S0042-96862005000900016.

Darling, M., Arendorf, T. and Samaranayake, L. (1992) 'Oral care of HIV-infected patients the knowledge and attitudes of South African dentists', *The Journal of The Dental Association of South Africa*, 47(9), pp. 399–402.

Elo, S. and Kyngäs, H. (2007) 'The qualitative content analysis process', *Journal of Advanced Nursing*, 62(1), pp. 107–115. doi: 10.1111/j.1365-2648.2007.04569.x.

Glick, M. *et al.* (1994) 'Oral manifestations associated with HIV-related disease as markers for immune suppression and AIDS', *Oral Surgery, Oral Medicine, Oral Pathology*, pp. 344–349. doi: 10.1016/0030-4220(94)90195-3.

Glick, M. (2005) 'Rapid HIV testing in the dental setting', *Journal of the American Dental Association*, pp. 1206–1208. doi: 10.14219/jada.archive.2005.0326.

Greenberg, B. L. *et al.* (2010) 'Dentists' attitudes toward chairside screening for medical conditions', *Journal of the American Dental Association*, pp. 52–62. doi: 10.14219/jada.archive.2010.0021.

Gumede, S. (2017) *Knowledge, Attitudes and Perceptions of Health Care Users Towards Hiv Self-Testing At Selected Gateway Clinics At Ethekwini District, Kwazulu-Natal*. Durban University of Technology. Available at: https://ir.dut.ac.za/bitstream/10321/2901/1/GUMEDE_SD_2017.pdf.

Hutchinson, M. K. *et al.* (2012) 'Feasibility of implementing rapid oral fluid HIV testing in an urban University Dental Clinic: a qualitative study', *BMC Oral Health*, 12(1). doi: 10.1186/1472-6831-12-11.

National Department of Health of South Africa (2015) *National HIV Testing Services Policy: 2016*. Available at: [http://www.sahivsoc.org/Files/HTS Policy 28 July final copy.pdf](http://www.sahivsoc.org/Files/HTS_Policy_28_July_final_copy.pdf).

Patton, L. *et al.* (2002) 'Education in HIV risk screening, counseling, testing, and referral: survey of U.S. dental schools', *Journal of Dental Education*, 66(10), pp. 1169–1177. Available at: <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed5&NEWS=N&AN=12449212>.

Ramphoma, K. J. and Naidoo, S. (2014) 'Knowledge, attitudes and practices of oral health care workers in Lesotho regarding the management of patients with oral manifestations of

HIV/AIDS.’, *SADJ: journal of the South African Dental Association = tydskrif van die Suid-Afrikaanse Tandheelkundige Vereniging*, 69(10), p. 446,448-453.

Reznik, D. and Bednarsh, H. (2014) *The role of the dental professional in managing patients with HIV/AIDS.*, *Dimensions of Dental Hygiene*. doi: 10.1016/0300-5712(76)90072-5.

Rudolph, M. J. and Ogunbodede, E. O. (1999) ‘HIV infection and oral health care in South Africa’, *SADJ: Journal of the South African Dental Association*, 54(12), pp. 594–601. Available at:

<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=med4&AN=16892566>.

Santella, A. *et al.* (2015) ‘Australian dentists’ perspectives on rapid HIV testing’, *Australian Dental Journal*, 61(3). doi: <https://doi.org/10.1111/adj.12371>.

Shisana, O. *et al.* (2014) *South African National HIV Prevalence, Incidence and Behaviour Survey, 2012*, *HSRC Press*. doi: 10.4314/ajpsy.v13i4.61877.

Singh, S. and Pottapinjara, S. (2017) ‘Dental undergraduate students’ knowledge, attitudes and practices in oral health self-care: A survey from a South African university’, *African Journal of Health Professions Education*, 9(2), pp. 83–87. doi: DOI:10.7196/AJHPE.2017.v9i2.800.

Statistics South Africa (2017) *Mid-year population estimates 2017*. doi: Statistical release P0302.

Tabb, Z. *et al.* (2017) ‘Assessing acceptability and feasibility of provider-initiated HIV testing and counseling in Ghana.’, *Rhode Island medical journal (2013)*, 100(8), pp. 19–22. Available at:

<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medl&NEWS=N&AN=28759895>.

Theron, P. M. (2015) ‘Coding and data analysis during qualitative empirical research in Practical Theology’, *In die Skriflig/In Luce Verbi*, 49(3). doi: <https://doi.org/10.4102/ids.v49i3.1880>.

University of Southern California (2018) *The discussion - organizing your social sciences research paper - research guides at University of Southern California, USC Libraries*. Available at: <https://libguides.usc.edu/writingguide>.

Whittemore, R., Chase, S. and Mandle, C. (2001) 'Validity in Qualitative Research', *Sage Journals*, 11(4).

WHO Collaborating Centre on Oral Manifestations of the Immunodeficiency Virus (1993) 'Classification and diagnostic criteria for oral lesions in HIV infection', *Journal of Oral Pathology & Medicine*, 22(7), pp. 289–291. doi: 10.1111/j.1600-0714.1993.tb01074.x.

Zungu, B. and Sanni, L. (2011) 'Acceptance and uptake of voluntary HIV testing among healthcare workers in a South African public hospital. TT -', *South African Family Practice*, 53(5), pp. 488–494. Available at:
<http://www.safpj.co.za/index.php/safpj/article/download/1665/2787>.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The importance of early opportunistic HIV screening and the significant role played by the oral health care worker in early detection and management of HIV infected individuals, has been well documented in international studies (Glick, 2005; Campo *et al.*, 2012; Abe, Kolude and Adeyemi, 2014; Santella, Conway and Watt, 2016). This study was conducted due to a lack of published evidence regarding the knowledge, attitudes, perceptions and practices of oral health care workers' regarding VCT in the public and private dental workplace in eThekweni, KwaZulu-Natal. This study has identified the opportunities, barriers and challenges to implementing VCT in the dental workplace in the eThekweni district.

The aim and objectives were structured with respect to three research questions. These were: 1) Does the dental workplace in the public and private sectors in the eThekweni District provide a suitable platform for Voluntary Counselling and rapid HIV testing services for dental patients? 2) What opportunities exist for implementing Voluntary Counselling and rapid HIV testing services in the dental workplace in the eThekweni district? 3) What possible barriers exist for the proposed implementation of Voluntary Counselling and rapid HIV testing in the dental workplace in the eThekweni District?

The aim of this study was to assess oral health care workers' knowledge, attitudes, perceptions and practices in Voluntary Counselling and rapid HIV testing in the dental clinical environment, so as to ascertain their acceptance and support for a proposed implementation of these services in the eThekweni district, KwaZulu-Natal. The study had four objectives to achieve its aim. These were: 1) To determine oral health care workers' knowledge and practices of Voluntary Counselling and Testing for HIV by means of a self-administered questionnaire. 2) To ascertain oral health care workers' attitude towards Voluntary Counselling and Testing for HIV by means of a self-administered questionnaire. 3) To determine oral health care workers' perceptions and practices of Voluntary Counselling and Testing for HIV by means of a self-administered questionnaire. 4) To determine the practicality and acceptance of implementing a rapid HIV testing programme in

the dental workplace by means of a semi-structured interview with the eThekweni Department of Health Chief Director.

The first objective was to determine oral health care workers' knowledge and practices of Voluntary Counselling and Testing for HIV in the eThekweni district by means of a self-administered questionnaire. Despite the majority of participants having heard of rapid HIV testing, it was found that many oral health care workers lack comprehensive HIV counselling and testing knowledge. It was reported that the majority of oral health care workers have not received any form of HIV testing training and almost all participants reported to not have pre- and post-test HIV counselling skills to perform HIV testing. Furthermore, oral health care workers' practice of HIV testing is inadequate, as nearly all participants do not test for HIV at their dental workplace. Additionally, the majority of oral health care workers reported to observe suspected HIV oral lesions in patients and nearly all participants have managed these patients by referral for HIV testing. However, oral health care workers have recognised their limitations and short comings in VCT service delivery and have reported to be willing to partake in HIV counselling and testing training workshops and have advocated for HIV testing training to be incorporated into the undergraduate curricula of oral health care workers.

The second objective was to ascertain oral health care workers' attitude towards Voluntary Counselling and Testing for HIV by means of a self-administered questionnaire. Nearly all participants expressed optimistic and positive attitudes regarding opportunistic routine HIV testing in the dental workplace. The majority of participants reported to be willing to implement HIV testing in their dental workplace and many participants reported that HIV testing is within the scope of dentistry. Almost all participants reported that HIV testing in the dental workplace should be performed, provided oral health care workers and staff are adequately trained and that an HIV testing policy specific to the dental workplace be implemented and guided by the Department of Health.

The third objective was to determine oral health care workers' perceptions of Voluntary Counselling and Testing for HIV by means of a self-administered questionnaire. Notwithstanding the majority of oral health care workers who identified the dire need for routine HIV testing in the

dental setting, participants have expressed mixed reactions regarding their perceptions in the implementation of HIV testing in the dental workplace. Some valuable reasons for those participants who supported the implementation of HIV testing in the dental workplace, included: promotion of HIV awareness and prevention of its spread, elimination of stigmatisation and improvement of healthcare system. Conversely, minority of oral health care workers that were not keen on the implementation of rapid HIV testing in the dental workplace, expressed their reasons such as lack of suitability of HIV testing in the private practice due to the time factor and lack of staff and proper training. In addition, some oral health care workers noted that the sensitive nature of HIV as well as fear of stigmatisation by the patients should strongly discourage HIV testing implementation in the dental workplace. With respect to gender, age group, profession of the health care provider, years of work experience, and number of patients seen on weekly basis and the option to implement HIV testing ($p>0.05$), there were no statistical differences recorded. This suggests that perceptions of the participants on testing for HIV testing at the dental workplace irrespective of the gender, age group, profession, years of experience, and number of patients seen on weekly basis was similar. In contrast, and with regards to the place of work of the participants, there was statistical significant differences ($p<0.05$). For example, it was gathered that more oral health workers from the private practice were against the implementation of HIV testing at the dental workplace when compared to other places of work. Furthermore, the majority of the participants were of the view that the government should ideally cover the cost if HIV testing is implemented in the dental workplace, whilst a handful indicted that the patient should be liable. The fourth objective was to determine the practicality and acceptance of implementing a rapid HIV testing programme in the dental workplace by means of a semi-structured interview with the eThekweni Department of Health Chief Director. From the interview with the chief director, it emerged that the Department of Health has no objection to implementation of HIV testing to the dental workplace. The Chief Director indicated that implementation of rapid HIV testing to the dental workplace is highly acceptable and provides a good opportunity to reach out to more members of the public and close the already existing gap in VCT service delivery. The director further elaborated that allied health services such as the dental workplace has been over looked and even referred to as a place of specialised work, not typically viewed as a primary health care site. The Chief Director recognises the need for additional HIV testing sites especially at the dental workplace, where oral manifestations are prevalent and are deemed important clinical markers of

HIV. The interview revealed that HIV testing at the dental workplace is highly valuable and emphasis was placed on training of all dental staff and integrating HIV testing to be a part of routine screening for all patients in an effort to include communicable and non-communicable diseases, such as TB and HIV, respectively, so that these diseases are recognised and treated promptly. Funding of this proposal was speculated to be a major obstacle in the implementation process, however, the director has indicated that funding for HIV testing training, together with the rapid HIV testing kits, is available and has been budgeted for. Additionally, the implementation of rapid HIV testing in the dental workplace, does not require a policy change as existing policy indicates that HIV testing should be provided by all health care workers at all levels (public and private sectors). Instead implementation process co-ordination in the public and private dental workplaces and data submission were identified as challenges to the implementation of HIV testing at the dental workplace. The Chief Director's input has recognised the implementation of rapid HIV testing at the dental workplace, to be of great importance and relevance in eThekweni.

With reference to the study's research questions: the first research question namely, *“Does the dental workplace in the public and private sectors in the eThekweni District provide a suitable platform for Voluntary Counselling and rapid HIV testing services for dental patients?”* was answered by means of a self-administered questionnaire completed by oral health care workers. A key component to this question was gaining insight into the attitudes and perceptions of the oral health care workers as a means of determining the acceptability of implementation of VCT in the dental workplace. It was found that the majority of the participants from the public and private dental workplaces expressed positive attitudes towards VCT at the dental workplace and indicated to be willing to implement HIV testing to their place of work. The prevalence of suspected HIV oral lesions reported by oral health care workers in this study, as well as the referral rate for HIV testing is significant and thus the dental workplace provides an ideal platform for on-site HIV screening. Oral health care workers have acknowledged their role in HIV screening and have indicated to want to bring about HIV awareness and improve the health system by assisting in early detection and proper management of HIV infected patients. However, the lack of HIV testing knowledge and skills among oral health care workers pose a concern. The majority of oral health care workers have reported to never have received HIV testing training, lack pre- and post-test counselling skills and have never performed rapid HIV testing. The lack of comprehensive HIV

testing knowledge and counselling skills, as well as the lack of personal use of rapid HIV testing kits, deems oral health care workers as incompetent in providing VCT to patients. Notwithstanding this, oral health care workers have acknowledged their shortcomings in VCT delivery by supporting the proposal of incorporating HIV counselling and testing training into the curricula of undergraduate students. Furthermore, oral health care workers, are willing to undergo HIV counselling and testing training and workshops in an effort to expand their knowledge and HIV testing skills. The lack of accessibility to primary health care services in eThekweni, have posed challenges in increasing the number of individuals tested for HIV and keeping up with the national HIV targets and goals. Therefore, additional opportunistic sites such as the dental workplace, can provide many individuals with basic primary health care services such as VCT and lessen the burden of the National Department of Health. Some concerns were raised among the minority of oral health care workers, particularly at the private dental workplace regarding VCT, such as: lack of trained staff to conduct HIV testing, time factor, stigma associated with HIV and lack of remuneration. It is well worth noting that many of the above mentioned factors are logistical issues that, with the guidance and support of the Department of Health, the private and public dental workplaces can provide a suitable and ideal platform for VCT.

The second research question: *“What opportunities exist for implementing Voluntary Counselling and rapid HIV testing services in the dental workplace in the eThekweni district?”* was answered by conducting a semi-structured face to face interview with the Chief Director of the eThekweni Department of Health. According the Chief Director, the feasibility of implementing HIV testing to the dental workplace is very much possible. Due to the dramatic reduction in the health budget for eThekweni and KwaZulu-Natal, funding was perceived to be a major barrier to implementation of VCT in the dental workplace. However, according to the Chief Director, HIV testing training and workshops, as well as rapid HIV kits, have already been budgeted for. Thus, oral health officials in the public sector are only required to indicate to the eThekweni Department of Health that there is a need for HIV testing training among oral health care workers at their specific health facility and the number of rapid HIV testing kits required. The Chief Director has indicated that there will be no remuneration for the private or public oral health care worker for offering VCT at their dental workplace. Instead, oral health care workers in the private sector are encouraged to form a partnership with the Department of Health, whereby the oral health care worker gains

recognition for providing VCT which may attract more patients to attend their private practice for additional treatment and in turn, generate more revenue for the oral health care worker. The Chief Director has recognised the dental workplace as a missed opportunity in VCT service delivery and has acknowledged the prevalence of HIV oral lesions, as well as the critical role that oral health care workers play in the early recognition of HIV. Therefore, the Chief Director has advocated for all oral health care workers, including dental assistants to be trained to counsel and test for HIV at the dental workplace.

The third research question, *“What possible barriers exist for the proposed implementation of Voluntary Counselling and rapid HIV testing in the dental workplace in the eThekweni District?”* was answered by conducting a semi-structured face to face interview with the Chief Director of the eThekweni Department of Health. Policy change of the existing HIV testing guidelines, was conceived to be a challenge in the implementation process of VCT in the dental workplace. However, according to the Chief Director, implementation coordination rather than policy change, is required, as policy recommends that all health care workers should offer VCT to the public at large. It was found that data coordination and submission in the private practice posed a challenge as rapid HIV test kits were supplied to health care workers, but the number of tests utilised were never submitted back to the Department of Health. Therefore, a proper system needs to be developed in order to overcome this challenge.

The aim of this study was to assess oral health care workers’ knowledge, attitudes, perceptions and practices in Voluntary Counselling and rapid HIV testing in the dental clinical environment, so as to ascertain their acceptance and support for a proposed implementation of these services in the eThekweni district, KwaZulu-Natal. The aim was achieved through the use of quantitative and qualitative data collection methods. Participants provided insight into their biographical background, knowledge and practice of HIV testing, as well as their attitudes and perceptions regarding VCT in the dental workplace. The Chief Director of eThekweni Department of Health, provided valuable information regarding the feasibility and practicality of implementing VCT in the private and public dental workplace in eThekweni. These findings and recommendations represent the collective participation and contribution of oral health care workers and the Chief Director of the eThekweni Department of Health.

5.2 Strengths of the study

This research study aimed at assessing the knowledge, attitudes, perceptions and practice of oral health care workers regarding HIV counselling and testing at the dental workplace and the acceptance of implementing VCT at the dental workplace. The findings from this study was successful in illustrating the aim. Importantly, this study helped to highlight a missing link in VCT at the dental workplace as a means to increase rates of HIV testing (Lane, 2008).

- The study was conducted in n=8 public dental departments in hospitals and clinics throughout eThekweni, as well as private dental practices from different socio-economic areas. Oral health care workers from different places of work throughout eThekweni, provided equitable representation, yielding more diverse and accurate results.
- The study brought about awareness and education to participants about HIV/AIDS by means of the information sheet.
- Many participants were keen and helpful in terms of completing the questionnaire and looked forward to HIV testing being implemented in the dental workplace.

5.3 Limitations of the study

The study provided valuable insight into oral health care workers' knowledge, attitudes and practice of HIV testing, but some limitations were noted. The study focused exclusively on oral health care workers in the eThekweni district. More research is required on a larger scale to further explore the knowledge, attitudes and practice of oral health care workers on a national level. Input from other health sectors involved in HIV testing may have provided insight into their perceptions regarding oral health care workers invading on their scope of work. Understanding the interplay between oral health care workers' HIV knowledge and training and social and cultural norms that influence oral health care workers' attitudes and perceptions towards HIV testing, is a factor to consider. The smaller study population among the public oral health care workers may be attributed to the fact that some oral health care workers work in mobile clinics and not in fixed clinics or hospitals, thereby possibly resulting in a skewed sample size. Additionally, the majority of oral health care workers in South Africa are located in the private sector (Bhayat and Chikte, 2017). This study relied on self-reporting information which could have resulted in over-reporting

with regards to oral health care workers' HIV testing practices. This observation is consistent with findings by Singh and Pottapinjara (2017) and Ahamed *et al.*, (2015) which found that self-reported data could be over or under-reported owing to social desirability.

5.4 Recommendations

The following recommendations can be made:

Short Term

- Wide distribution of the national HTS/VCT Referral Directory to increase access to testing.
- Scale up community-based oral health prevention and promotion campaigns to create and maintain HIV awareness and knowledge.
- Develop mentoring and sustainable educational in-service training guide for oral health workers regarding HIV and testing.
- Develop a protocol for referral between oral health facilities (public and private) and HIV testing sites, as well as proper record keeping and reporting to the Department of Health, as to not lose any patient in the system.

Long Term

- A review of current policies on HIV testing to extend opportunistic rapid HIV testing for patients at the public dental clinics and hospitals. Factors such as logistics, funding, resources, time and HIV training need to be considered.
- Development of an HIV testing policy for private oral health care workers.
- HIV/AIDS training workshops and refresher courses specifically designed for oral health care workers, where emphasis of the workshops are placed on HIV oral manifestations, rapid HIV testing knowledge and use, and proper management and continuum of care of the infected individual.
- Training of rapid HIV testing to all undergraduate oral health care students.
- Maintain and improve all HIV services at the lower health levels to reduce burden on upper levels.

5.5 Summary

This study indicated that in eThekweni, oral health care workers' knowledge and training regarding HIV testing is inadequate and their HIV testing practices are poor, as HIV testing is infrequently performed at the dental workplace. However, oral health care workers attitudes and perceptions towards implementing HIV testing to the dental workplace is one of optimism and willingness. The eThekweni department of health has indicated that the feasibility of implementing HIV testing at the dental workplace is a very good possibility. Drawing from the opinions and views expressed through this study and international studies regarding HIV and testing, ambitious, yet achievable suggestions can be reviewed by the department of health. These would include developing an oral health HIV testing policy which advocates for the active involvement of all oral health care workers to provide HIV testing and counselling to patients in the public and private dental workplaces. International HIV counselling and testing policies within the dental workplace (Austin, 2009), provide a template that the Department of Health could consider incorporating into South African health policy. Importantly, the Department of Health could consider HIV testing and counselling training to all undergraduate health students as the national competency of health care professionals. In this way, not only would oral health care workers be recognised as primary health care givers that are crucial in the early detection of HIV, but most importantly more patients would be getting tested and put onto proper linkages to health care, thus aiding South Africa in attaining their target to eradicate HIV/AIDS by 2030.

References

- Abaunza, H. and Romero, K. (2014) 'Elements for adequate informed consent in the surgical context', *World Journal of Surgery*, 38(7), pp. 1594–1604. doi: 10.1007/s00268-014-2588-x.
- Abe, E., Kolude, B. and Adeyemi, B. (2014) 'HIV testing in dental practice: perception and attitude of dentists in Southwestern Nigeria', *African Journal of Medicine and Medical Sciences*, 43(Suppl 1), pp. 201–208. doi: 10.1016/j.coviro.2015.09.001.Human.
- Agency for Healthcare Research (2011) 'Mixed Methods: Integrating Quantitative and Qualitative Data Collection and Analysis While Studying Patient-Centered Medical Home Models PCMH Research Methods Series'. doi: No. 13-0028-EF.
- Ahamed, S. *et al.* (2015) 'Evaluation of the oral health knowledge, attitude and behavior of the preclinical and clinical dental students', *Journal of International Oral Health*, 7(6), pp. 65–70. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4479777/pdf/JIOH-7-65.pdf>.
- Arendorf, T. *et al.* (1998) 'Oral manifestations of HIV infection in 600 South African patients', *Journal of Oral Pathology & Medicine - Wiley Online Library*, 24(4), pp. 176–179. doi: <https://doi.org/10.1111/j.1600-0714.1998.tb01936.x>.
- Asante, A. D. (2007) 'Scaling up HIV prevention: Why routine or mandatory testing is not feasible for sub-Saharan Africa', *Bulletin of the World Health Organization*, 85(8), pp. 644–646. doi: 10.2471/BLT.06.037671.
- Austin, C. (2009) *Rapid HIV Testing in the Dental Office, DentistryQ*. Available at: http://cdeworld.com/courses/20185-Rapid_HIV_Testing_in_the_Dental_Office (Accessed: 23 June 2018).
- Austin, J. S. and Z. (2015) 'Qualitative Research: Data Collection, Analysis, and Management', *CJHP*, 68(3), pp. 226–231.
- Baillie, L. (2015) 'Promoting and evaluating scientific rigour in qualitative research', *Nursing Standard*, 29(46), pp. 36–42. doi: 10.7748/ns.29.46.36.e8830.
- Bazilli, S. *et al.* (2006) *Prognosis for the Inequality Virus : Gender , Democracy , Reconstruction & HIV / AIDS in Southern Africa*.
- Berberi, A. and Aoun, G. (2017) 'Oral lesions associated with human immunodeficiency virus in 75 adult patients: a clinical study', *Journal of the Korean Association of Oral and Maxillofacial Surgeons*, 43(6), p. 388. doi: 10.5125/jkaoms.2017.43.6.388.

- Bhayat, A. and Chikte, U. (2017) 'The changing demographic profile of dentists and dental specialists in South Africa: 2002–2015', *International Dental Journal*, 68(2), pp. 91–96. doi: 10.1111/idj.12332.
- Bhayat, A., Yengopal, V. and Rudolph, M. (2010) 'Predictive value of group I oral lesions for HIV infection', *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology*, 109(5), pp. 720–723. doi: 10.1016/j.tripleo.2009.11.019.
- Black, K. (2010) *Business Statistics: For Contemporary Decision Making*. Available at: <http://staff.uny.ac.id/sites/default/files/pendidikan/dr-tony-wijaya-se-mm/referensi-statistic-cp1.pdf>.
- Bowen, G. A. (2008) 'Naturalistic inquiry and the saturation concept: A reasearch note.', *Qualitative Research*, 8(1), pp. 137–152. doi: 10.1177/1468794107085301.
- Branson, B. *et al.* (2006) *Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings*. Available at: <https://www.cdc.gov/MMWR/Preview/MMWRhtml/rr5514a1.htm>.
- Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, 3(2), pp. 77–101. doi: 10.1191/1478088706qp063oa.
- Van Den Broeck, J. *et al.* (2005) 'Data cleaning: Detecting, diagnosing, and editing data abnormalities', *PLoS Medicine*, 2(10), pp. 0966–0970. doi: 10.1371/journal.pmed.0020267.
- Cahana, A. and Hurst, S. A. (2008) 'Voluntary informed consent in research and clinical care: an update.', *Pain practice : the official journal of World Institute of Pain*, 8(6), pp. 446–51. doi: 10.1111/j.1533-2500.2008.00241.x.
- Campo, J. *et al.* (2012) 'Role of the dental surgeon in the early detection of adults with underlying HIV infection/AIDS', *Medicina Oral, Patologia Oral y Cirugia Bucal*, 17(3). doi: 10.4317/medoral.17527.
- Carter, N. *et al.* (2014) 'The Use of Triangulation in Qualitative Research', *Oncology Nursing Forum*, 41(5), pp. 545–547. doi: 10.1188/14.ONF.545-547.
- Centers for Disease Control and Prevention (2018) *About HIV/AIDS*. Available at: <https://www.cdc.gov/hiv/basics/whatishiv.html>.
- Cherutich, P. *et al.* (2012) 'Lack of Knowledge of HIV Status a Major Barrier to HIV Prevention , Care and Treatment Efforts in Kenya : Results from a Nationally Representative Study', 7(5), pp. 1–10. doi: 10.1371/journal.pone.0036797.

- Chonco, S. T. (2016) *Factors influencing delayed HIV testing: : A client perspective*. Dissertation submitted in fulfilment of the requirements for the Degree in Master of Health Sciences (Nursing) in the Faculty of Health Sciences at the Durban University of Technology. Available at: file:///C:/Users/AnyUser/Downloads/CHONCO_2016.pdf.
- De Cock, K. M., Mbori-Ngacha, D. and Marum, E. (2002) 'Shadow on the continent: public health and HIV / AIDS in Africa in the 21st century', *Lancet*, 360, pp. 67–72. doi: [http://dx.doi.org/10.1016/S0140-6736\(02\)09337-6](http://dx.doi.org/10.1016/S0140-6736(02)09337-6).
- Cohen, M. S. *et al.* (2010) 'The Detection of Acute HIV Infection', *Journal of Infectious Diseases*, 202(Suppl 2), pp. S270-7.
- Coogan, M. M., Greenspan, J. and Challacombe, S. J. (2005) 'Oral lesions in infection with human immunodeficiency virus', *Bulletin of the World Health Organization*, 83(9), pp. 700–706. doi: /S0042-96862005000900016.
- Creswell, J. W. and Creswell, D. (2007) *Research Design: Qualitative, Quantitative and Mixed Method Approaches*, SAGE Publications. doi: 10.4135/9781849208956.
- Darling, M., Arendorf, T. and Samaranayake, L. (1992) 'Oral care of HIV-infected patients the knowledge and attitudes of South African dentists', *The Journal of The Dental Association of South Africa*, 47(9), pp. 399–402.
- Day, J. H. *et al.* (2003) 'Attitudes to HIV voluntary counselling and testing among mineworkers in South Africa: Will availability of antiretroviral therapy encourage testing?', *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*, 15(5), pp. 665–672. doi: 10.1080/0954012030001595140.
- Delpierre, C. *et al.* (2007) 'Correlates of late HIV diagnosis: Implications for testing policy', *International Journal of STD and AIDS*, 18(5), pp. 312–317. doi: 10.1258/095646207780749709.
- Department of Health of South Africa (2017) *Ideal clinic manual: Version 17*. Available at: [//www.kznhealth.gov.za/family/Ideal-Clinic-Manual-Oct2015.pdf](http://www.kznhealth.gov.za/family/Ideal-Clinic-Manual-Oct2015.pdf).
- Dilernia, D. A. *et al.* (2010) '[The importance of early diagnosis for the survival of HIV positive patients].', *Medicina*, 70(5), pp. 453–456.
- Dombrowski, J. and Kinney, R. (2017) *Core Concepts - Retention in HIV Care - Basic HIV Primary Care - National HIV Curriculum, National HIV Curriculum*. Available at: <https://www.hiv.uw.edu/go/basic-primary-care/retention-care/core-concept/all> (Accessed: 25

May 2018).

Dookie, S., Singh, S. and Myburgh, N. G. (2017) ‘Analysis of district oral health services in Kwazulu-Natal’, *Etude de la Population Africaine*, 31(2), pp. 3683–3693. doi: 10.11564/31-2-1041.

Ebot, M. (2009) *Perception of Hiv/Aids Among Students At the University of Joensuu*.

Elo, S. and Kyngäs, H. (2007) ‘The qualitative content analysis process’, *Journal of Advanced Nursing*, 62(1), pp. 107–115. doi: 10.1111/j.1365-2648.2007.04569.x.

Encyclopedia of Research Design (2010) *t Test, One Sample*, SAGE Research Methods. doi: ISBN: 9781412961288.

Etikan, I. (2016) ‘Comparison of Convenience Sampling and Purposive Sampling’, *American Journal of Theoretical and Applied Statistics*, 5(1), p. 1. doi: 10.11648/j.ajtas.20160501.11.

FDA (2017) *Consumer Updates - First Rapid Home-Use HIV Kit Approved for Self-Testing, U.S. Food and Drug Administration*. Available at: <https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm310545.htm> (Accessed: 12 July 2018).

Folkman, S. *et al.* (1994) ‘Caregiver burden in HIV-positive and HIV-negative partners of men with AIDS.’, *Journal of consulting and clinical psychology*, 62(4), pp. 746–756. doi: 10.1037/0022-006X.62.4.746.

Gazzard, B. *et al.* (2008) ‘Indicator disease-guided testing for HIV--the next step for Europe’, *HIV Med*, 9(2), pp. 34–40. doi: 10.1111/j.1468-1293.2008.00592.x.

Gilmore, N. and Somerville, M. A. (1994) ‘Stigmatization, scapegoating and discrimination in sexually transmitted diseases: Overcoming “them” and “us”’, *Social Science and Medicine*, 39(9), pp. 1339–1358. doi: 10.1016/0277-9536(94)90365-4.

Glick, M. *et al.* (1994) ‘Oral manifestations associated with HIV-related disease as markers for immune suppression and AIDS’, *Oral Surgery, Oral Medicine, Oral Pathology*, pp. 344–349. doi: 10.1016/0030-4220(94)90195-3.

Glick, M. (2005) ‘Rapid HIV testing in the dental setting’, *Journal of the American Dental Association*, pp. 1206–1208. doi: 10.14219/jada.archive.2005.0326.

Greenberg, B. L. *et al.* (2010) ‘Dentists’ attitudes toward chairside screening for medical conditions’, *Journal of the American Dental Association*, pp. 52–62. doi: 10.14219/jada.archive.2010.0021.

- Greenwald, J. L. *et al.* (2006) 'A rapid review of rapid HIV antibody tests', *Current Infectious Disease Reports*, 8(2), pp. 125–131. doi: 10.1007/s11908-006-0008-6.
- Gumede, S. (2017) *Knowledge, Attitudes and Perceptions of Health Care Users Towards Hiv Self-Testing At Selected Gateway Clinics At Ethekwini District, Kwazulu-Natal*. Durban University of Technology. Available at:
https://ir.dut.ac.za/bitstream/10321/2901/1/GUMEDE_SD_2017.pdf.
- Gurayaa, S., London, N. and Gurayaa, S. (2008) 'Ethics in Medical Research', *Easy Interpretation of Biostatistics*, pp. 128–132. doi: 10.1016/B978-1-4160-3142-0.50024-9.
- Hale, J. (2009) *The 3 Basic Types of Descriptive Research Methods*, *Psych Central*. Available at:
<https://psychcentral.com/blog/the-3-basic-types-of-descriptive-research-methods/>.
- Hamers, F. F. and Phillips, A. N. (2008) 'Diagnosed and undiagnosed HIV-infected populations in Europe', *HIV Medicine*, 9(SUPPL. 2), pp. 6–12. doi: 10.1111/j.1468-1293.2008.00584.x.
- Hanssens, C. (2007) 'Legal and Ethical Implications of Opt-Out HIV Testing', *Clinical Infectious Diseases*, 45(Supplement 4), pp. S232–S239. doi: 10.1086/522543.
- Hassan, Z. A., Schattner, P. and Mazza, D. (2006) 'Doing a pilot study: Why is it essential?', 1(2), pp. 70–73. Available at:
<https://pdfs.semanticscholar.org/0547/01f88a9841ffce18244fa82ce0f134d836c.pdf>.
- Hitchcock, L. (2016) *KZN - highest new HIV rate | News24, News24*. Available at:
<http://www.news24.com/SouthAfrica/Local/Greytown-Gazette/kzn-highest-new-hiv-rate-20160621> (Accessed: 23 May 2018).
- Hutchinson, M. K. *et al.* (2012) 'Feasibility of implementing rapid oral fluid HIV testing in an urban University Dental Clinic: a qualitative study', *BMC Oral Health*, 12(1). doi: 10.1186/1472-6831-12-11.
- Hutchinson, P. L. and Mahlalela, X. (2006) 'Utilization of voluntary counseling and testing services in the Eastern Cape, South Africa', *PubMed*, 18(5), pp. 446–455. doi: 10.1080/09540120500213511.
- International Federation of Red Cross and Red Crescent Societies (2008) *World disasters report 2008: focus on HIV and AIDS, World disasters report 2008: focus on HIV and AIDS*.
- Itula, P. F. B. *et al.* (1997) 'Orofacial manifestations and seroprevalence of HIV infection in Namibian dental patients.', *Oral Diseases*, 3, pp. S51-3. Available at:
<http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2001023513&site=ehost->

live.

Johnson, L. F. *et al.* (2013) ‘Life expectancies of South African adults starting Antiretroviral Treatment: Collaborative analysis of cohort studies’, *PLoS Med*, p. e1001418. doi: 10.1371/journal.pmed.1001418.

Jürgens, R. (2007) “Routinizing” *HIV testing in low- and middle-income countries – Background paper*. Available at: http://pdc.ceu.hu/archive/00003268/01/routinizing_hiv_testing.pdf.

Kalichman, S. C. and Simbayi, L. C. (2003) ‘HIV testing attitudes, AIDS stigm, and voluntary HIV counselling and testing in a black township in Cape Town, South Africa’, *Sexually Transmitted Infections*, 79(6), pp. 442–447.

Kamuya, D., Marsh, V. and Molyneux, S. (2011) ‘What we learned about voluntariness and consent: Incorporating “background situations” and understanding into analyses’, *American Journal of Bioethics*, 11(8), pp. 31–33. doi: 10.1080/15265161.2011.583328.

Katz, I. T. and Maughan-Brown, B. (2017) ‘Improved life expectancy of people living with HIV: who is left behind?’, *The Lancet HIV*, 4(8), pp. e324–e326. doi: 10.1016/S2352-3018(17)30086-3.

Ketefian, S. (2015) ‘Ethical considerations in research. Focus on vulnerable groups.’, *Invest Educ Enferm*, 33(1), pp. 164–172. doi: 10.1007/978-94-6300-112-0_4.

Korenromp, E. L. *et al.* (2005) ‘Determinants of the Impact of Sexually Transmitted Infection Treatment on Prevention of HIV Infection: A Synthesis of Evidence from the Mwanza, Rakai, and Masaka Intervention Trials’, *The Journal of Infectious Diseases*, 191(s1), pp. S168–S178. doi: 10.1086/425274.

Krefting, L. (1991) ‘Trustworthiness’, 45(3), pp. 214–222.

Krishna, R., Zemse, S. and Derossi, S. (2011) *Individuals with HIV/AIDS: Clinical manifestations in the oral cavity in the post-HAART era, Global view of HIV infection*.

KwaZulu-Natal Department of Health (2015) *District Health Plans 2015/2016 - eThekwini Health District*. Available at: <http://www.kznhealth.gov.za/Strategic/DHP/2015-16/eThekwini.pdf>.

KwaZulu-Natal Department of Health (2016) ‘Service Delivery Improvement Plan 2016/17 - 2018/19’, pp. 1–54. Available at: http://www.kznhealth.gov.za/Service_delivery_improvement_plan-2017-18-19.pdf.

- KwaZulu-Natal Department of Health (2017) *Department of Health KZN Annual report 2016/17*. Available at: <http://www.kznhealth.gov.za/2016-2017-Annual-Report.pdf>.
- Lane, H. (2008) *An exploratory study into the factors that constrain or enable voluntary HIV testing among young adults in Cape Town, South Africa, University of Cape Town (UCT)*. Available at: <http://hdl.handle.net/11427/11591> (Accessed: 14 May 2018).
- Largent, E. *et al.* (2013) 'Misconceptions about coercion and undue influence: Reflections on the views of IRB members', *Bioethics*, 27(9), pp. 500–507. doi: 10.1111/j.1467-8519.2012.01972.x.
- Layne, V. (1997) *The sound archives at the District Six museum: A work in progress, Archives for the Future*.
- Leon, N. *et al.* (2010) 'The impact of provider-initiated (opt-out) HIV testing and counseling of patients with sexually transmitted infection in Cape Town, South Africa: a controlled trial', *Implement Sci*, 5, p. 8. doi: 10.1186/1748-5908-5-8.
- Lincoln, Y. S. and Guba, E. G. (1985) *Lincoln and Guba 's Evaluative Criteria, Naturalistic Inquiry*. Available at: <http://www.crec.co.uk/docs/Lincoln and Guba.pdf> (Accessed: 25 May 2018).
- Manzi, M. *et al.* (2005) 'High acceptability of voluntary counselling and HIV-testing but unacceptable loss to follow up in a prevention of mother-to-child HIV transmission programme in rural Malawi: Scaling-up requires a different way of acting', *Tropical Medicine and International Health*, 10(12), pp. 1242–1250. doi: 10.1111/j.1365-3156.2005.01526.x.
- Marks, G., Crepaz, N. and Janssen, R. S. (2006) 'Estimating sexual transmission of HIV from persons aware and unaware that they are infected with the virus in the USA', *Aids*, pp. 1447–1450. doi: 10.1097/01.aids.0000233579.79714.8d.
- Matovu JK and Makumbi FE (2007) 'Expanding access to voluntary HIV counselling and testing in sub-Saharan Africa: alternative approaches for improving uptake, 2001-2007', *Trop Med Int Health*, 12(11), pp. 1315–22.
- McLeod, S. (2008) 'Likert Scale | Simply Psychology', *Simply Psychology*. Available at: <http://www.simplypsychology.org/likert-scale.html>.
- Mohlabane, N. *et al.* (2016) 'Barriers and facilitators associated with HIV testing uptake in South African health facilities offering HIV Counselling and Testing', *Health SA Gesondheid*, 21, pp. 86–95. doi: 10.1016/J.HSAG.2015.11.001.
- Moodley, D. *et al.* (2008) 'Reliability of HIV rapid tests is user dependent', *South African*

Medical Journal, 98(9), pp. 707–711.

Moon, K. *et al.* (2016) ‘A guideline to improve qualitative social science publishing in ecology and conservation journals’, *Ecology and Society*, 21(3). doi: 10.5751/ES-08663-210317.

Moreno, B. and Arteaga, G. (2012) ‘Violation of ethical principles in clinical research. Influences and possible solutions for Latin America’, *BMC Medical Ethics Journal*, 13(1), p. 35. doi: 10.1186/1472-6939-13-35.

Mwisongo, A. *et al.* (2016) ‘The quality of rapid HIV testing in South Africa: An assessment of testers’ compliance’, *African Health Sciences*, 16(3), pp. 646–654. doi: 10.4314/ahs.v16i3.2.

Nakigozi, G. *et al.* (2013) ‘A qualitative study of barriers to enrollment into free HIV care: Perspectives of never-in-care HIV-positive patients and providers in Rakai, Uganda’, *BioMed Research International*, 2013. doi: 10.1155/2013/470245.

National Department of Health of South Africa (2011) *HIV and AIDS and STI strategic plan for South Africa, 2007-2011, South Africa*.

National Department of Health of South Africa (2015) *National HIV Testing Services Policy: 2016*. Available at: <http://www.sahivsoc.org/Files/HTS Policy 28 July final copy.pdf>.

Odell, E. and Cawson, R. (2008) *Cawson’s Essentials of Oral Pathology and Oral Medicine, Journal of Chemical Information and Modeling*. Churchill Livingstone. doi: 10.1017/CBO9781107415324.004.

Parish, C. *et al.* (2017) ‘HIV testing in the dental setting: perspectives and practices of experienced dental professionals’, *AIDS Care*, 30(3), pp. 347–352. Available at: <https://doi.org/10.1080/09540121.2017.1367087>.

Patton, L. *et al.* (2002) ‘Education in HIV risk screening, counseling, testing, and referral: survey of U.S. dental schools’, *Journal of Dental Education*, 66(10), pp. 1169–1177. Available at: <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed5&NEWS=N&AN=12449212>.

Patton, L. L. *et al.* (1999) ‘Oral hairy leukoplakia and oral candidiasis as predictors of... : AIDS’, *International AIDS Society Journal*, 13(15), p. 2174.

Peltzer, K. *et al.* (2009) ‘Determinants of knowledge of HIV status in South Africa: results from a population-based HIV survey.’, *BMC Public Health*, 9, p. 174. Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2700104/?tool=pubmed%5Cnhttp://dx.doi.org/10.1186/1471-2458-9-174>.

- PEPFAR (2017) *United States President 's Emergency Plan for AIDS Relief-Pepfar in KwaZulu-Natal*. Available at: <https://za.usembassy.gov/wp-content/uploads/sites/19/2017/08/20170821-KZN-Fact-Sheet-pm.pdf>.
- Pindborg, J. J. (1989) 'Classification of oral lesions associated with HIV infection.', *Oral surgery, oral medicine, and oral pathology*, 67(3), pp. 292–295.
- Polit, D. and Beck, C. T. (2012) *Nursing Research: Generating and assessing evidence for nursing practice*, Lippincott Williams & Wilkins. doi: 10.1097/01.NMC.0000363684.43186.fe.
- Pollack, H. A. *et al.* (2014) 'Dentists' willingness to provide expanded hiv screening in oral health care settings: Results from a nationally representative survey', *American Journal of Public Health*. doi: 10.2105/AJPH.2013.301700.
- Ramphoma, K. J. (2016) 'Oral Health in South Africa: Exploring the role of dental public health specialists.', *South African Dental Journal*, 71(9), pp. 402–403. Available at: http://www.scielo.org.za/pdf/sadj/v71n9/05.pdf%0Ahttp://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0011-85162016000900005&lng=en&tlng=en.
- Ramphoma, K. J. and Naidoo, S. (2014) 'Knowledge, attitudes and practices of oral health care workers in Lesotho regarding the management of patients with oral manifestations of HIV/AIDS.', *SADJ: journal of the South African Dental Association = tydskrif van die Suid-Afrikaanse Tandheelkundige Vereniging*, 69(10), p. 446,448-453.
- Rennie, S. and Behets, F. (2006) 'Desperately seeking targets: The ethics of routine HIV testing in low-income countries', *Bulletin of the World Health Organization*, 84(1), pp. 52–57. doi: 10.2471/BLT.05.025536.
- Republic of South Africa National Department of Health (2010) *National HIV Counselling and Testing (HCT) Policy Guidelines: South Africa*. Available at: https://aidsfree.usaid.gov/sites/default/files/hts_policy_south-africa.pdf.
- Research Methodology (2018) *Exploratory research*. Available at: <https://research-methodology.net/research-methodology/research-design/exploratory-research/>.
- Reznik, D. and Bednarsh, H. (2014) *The role of the dental professional in managing patients with HIV/AIDS.*, *Dimensions of Dental Hygiene*. doi: 10.1016/0300-5712(76)90072-5.
- Robinson, P. G., Challacombe, S. J. and Sheiham, A. (1998) 'Oral examination: A screening tool for HIV infection?', *Sexually Transmitted Infections*, pp. 345–348. doi: 10.1136/sti.74.5.345.
- Rudolph, M. J. and Ogunbodede, E. O. (1999) 'HIV infection and oral health care in South

Africa', *SADJ: Journal of the South African Dental Association*, 54(12), pp. 594–601. Available at:

<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=med4&AN=16892566>.

Ryan, V. D. *et al.* (2005) 'Making sense of voluntary participation: A theoretical synthesis', *Rural Sociology*, 70(3), pp. 287–313. doi: <https://doi.org/10.1526/0036011054831198>.

SAHO (2011) *HIV/AIDS in South Africa*. Available at: <http://www.sahistory.org.za/structure-government-south-africa> (Accessed: 23 May 2018).

Santella, A. *et al.* (2015) 'Australian dentists' perspectives on rapid HIV testing', *Australian Dental Journal*, 61(3). doi: <https://doi.org/10.1111/adj.12371>.

Santella, A., Conway and Watt (2016) 'The potential role of dentists in HIV screening.', *British Dental Journal*, 220(5)(December), pp. 229–233.

Schofield, B. (2014) 'Informed consent in research.', *European Health Psychologist*, 16(3), pp. 101–106. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/12455549>.

Setia, M. S. (2016) 'Methodology Series Module 3: Cross-sectional Studies', *Indian Journal of Dermatology*, 61(3), pp. 261–264. Available at:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4885177/>.

Shenton, A. (2004) *Strategies for ensuring trustworthiness in qualitative research projects*, *Research Gate*. doi: DOI: 10.3233/EFI-2004-22201.

Shiboski, C. H. *et al.* (2009) 'The Oral HIV / AIDS Research Alliance : updated case definitions of oral disease endpoints', *Journal of Oral Pathology and Medicine*, 38(6), pp. 481–488. doi: 10.1111/j.1600-0714.2009.00749.x.

Shisana, O. *et al.* (2014) *South African National HIV Prevalence, Incidence and Behaviour Survey, 2012*, *HSRC Press*. doi: 10.4314/ajpsy.v13i4.61877.

Siegel, K. *et al.* (2012) 'Rapid HIV testing in dental practices', *American Journal of Public Health*, 102(4), pp. 625–632. doi: 10.2105/AJPH.2011.300509.

Simon, V., Ho, D. D. and Karim, Q. A. (2006) 'HIV / AIDS epidemiology , pathogenesis , prevention , and treatment', *Lancet*, 368(9534), pp. 489–504.

Singh, S. and Pottapinjara, S. (2017) 'Dental undergraduate students' knowledge, attitudes and practices in oral health self-care: A survey from a South African university', *African Journal of Health Professions Education*, 9(2), pp. 83–87. doi: DOI:10.7196/AJHPE.2017.v9i2.800.

South African National Aids Council (SANAC) (2016) *The National Strategic Plan (NSP) 2017 – 2022*. Available at: <http://nsp.sanac.org.za/> (Accessed: 23 May 2018).

SPSS Incorporated (2004) *Questionnaire design and analysing data using SPSS, SPSS Survey Tips*. Available at: <http://www.spss.com/PDFs/STIPir.pdf>.

Statista (2016) • *HIV prevalence country ranking 2016 | Statistic*. Available at: <https://www.statista.com/statistics/270209/countries-with-the-highest-global-hiv-prevalence/>.

Statistics South Africa (2017) *Mid-year population estimates 2017*. doi: Statistical release P0302.

Streubert, H. and Carpenter, D. (1996) *Qualitative Research in Nursing: Advancing the Humanistic Imperative, Nursing Research*. doi: 10.1097/00006199-199601000-00014.

Tabb, Z. *et al.* (2017) ‘Assessing acceptability and feasibility of provider-initiated HIV testing and counseling in Ghana.’, *Rhode Island medical journal (2013)*, 100(8), pp. 19–22. Available at: <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medl&NEWS=N&AN=28759895>.

The Editors of Encyclopaedia Britannica (2017) *KwaZulu-Natal province, South Africa, Encyclopædia Britannica, inc*. Available at: <https://www.britannica.com/place/KwaZulu-Natal> (Accessed: 26 June 2018).

Theron, P. M. (2015) ‘Coding and data analysis during qualitative empirical research in Practical Theology’, *In die Skriflig/In Luce Verbi*, 49(3). doi: <https://doi.org/10.4102/ids.v49i3.1880>.

Thomas and Myagilvy (2011) ‘Qualitative Rigor or Research Validity in Qualitative ResearchThomas_et_al-2011-Journal_for_Specialists_in_Pediatric_Nursing.pdf’, *Journal for Specialists in Pediatric Nursing*, 16(2), pp. 151–155. doi: <https://doi.org/10.1111/j.1744-6155.2011.00283.x>.

Thomas, P. . (2010) ‘Research Methodology and Design’, *Research Methodology and Design*, pp. 291–334. doi: 10.1515/9783110215519.82.

Trochim, W. M. K. (2002) ‘Qualitative Measures’, *Research Methods Knowledge Base*, p. 16.

U.S Department of Veterans Affairs (2018) *How is HIV not spread?*, *Department of Veterans Affairs*. Available at: <https://www.nichd.nih.gov/health/topics/hiv/conditioninfo/Pages/not-spread.aspx>.

UNAIDS (2006) *2006 Report on the global AIDS epidemic, Joint UN Programme on HIV/AIDS*.

Available at: http://data.unaids.org/pub/report/2006/2006_gr_en.pdf www.unaids.org.

UNAIDS (2007) 'Reducing HIV Stigma and Discrimination: a critical part of national AIDS programmes A resource for national stakeholders in the HIV response', *Switzerland*, pp. 1–56.

UNAIDS (2013) *Global Report: UNAIDS report on the global AIDS epidemic 2013*, *Unaids*. doi: JC2502/1/E.

UNAIDS (2014) *The Emissions Gap Report 2014: A UNEP synthesis Report*, *UNAIDS*. doi: ISBN 978-92-9253-062-4.

UNAIDS (2016) *United Nations Millennium Development Goals*, *United Nations*. Available at: <http://www.un.org/millenniumgoals/>.

UNAIDS (2017a) *Ending Aids Progress Towards the 90-90-90 Targets*, *Global Aids Update*. doi: UNAIDS/JC2900E.

UNAIDS (2017b) *South Africa, UNAIDS Estimates South Africa*. Available at: <http://www.unaids.org/en/regionscountries/countries/southafrica> (Accessed: 23 May 2018).

UNAIDS and Kharsany, A. (2016) *Unrelenting spread of HIV amongst Adolescent girls and young women in rural and urban KwaZulu-Natal*, *CAPRISA*. Available at: <http://www.caprisa.org/News/Read/30196> (Accessed: 25 June 2018).

UNFPA ESARO (2016) *How effective is comprehensive sexuality education in preventing HIV?* Available at: https://esaro.unfpa.org/sites/default/files/pub-pdf/CSE_A4_FA_low_res_pages.pdf.

UNICEF (2015) *The sustainable development goals*.

Universal Teacher (2017) *Dependability in Qualitative Research*. Available at: <https://goo.gl/mxrC9s> (Accessed: 14 July 2018).

University Computing Services (1996) *Guide to the design of questionnaires*, *The University of Leeds*. Available at: <http://www.kcl.ac.uk/content/1/c6/01/80/69/chapter11.pdf> <https://www.kcl.ac.uk/content/1/c6/01/80/69/chapter11.pdf> (Accessed: 14 July 2018).

University of Southern California (2018) *The discussion - organizing your social sciences research paper - research guides at University of Southern California, USC Libraries*. Available at: <https://libguides.usc.edu/writingguide>.

Vernillo, A. T. and Caplan, A. L. (2007) 'Routine HIV testing in dental practice: can we cross the Rubicon?', *J Dent Educ*, 71(12), pp. 1534–1539. doi: 71/12/1534 [pii].

Vos, D. et al. (2011) *Research at grass roots -For the social sciences and human service*

- professions*. Available at: De Vos, AS, Strydom, H, Fouché, CB, Delpont, CSL.
- Watson, R. (2015) ‘Quantitative Research’, *Nursing Standard*, 29(31), pp. 44–48. doi: 10.4135/9781412950589.n787.
- Weihls, M. and Meyer-Weitz, A. (2016) ‘Barriers to workplace HIV testing in South Africa: a systematic review of the literature’, *AIDS Care*, 28(4), pp. 495–499. doi: 10.1080/09540121.2015.1109586.
- Weiser, S. D. *et al.* (2006) ‘Routine HIV testing in Botswana: A population-based study on attitudes, practices, and human rights concerns’, *PLoS Medicine*, 3(7), pp. 1013–1022. doi: 10.1371/journal.pmed.0030261.
- Whittemore, R., Chase, S. and Mandle, C. (2001) ‘Validity in Qualitative Research’, *Sage Journals*, 11(4).
- WHO (2004) *Rapid HIV tests: guidelines for use in HIV testing and counselling services in resource-constrained settings*. Available at: d:%5CMy Documents%5CEric’s things%5CInternet-related%5Cpdfs_downloads%5CWHO documents%5Crapidhivtests.pdf.
- WHO Collaborating Centre on Oral Manifestations of the Immunodeficiency Virus (1993) ‘Classification and diagnostic criteria for oral lesions in HIV infection’, *Journal of Oral Pathology & Medicine*, 22(7), pp. 289–291. doi: 10.1111/j.1600-0714.1993.tb01074.x.
- World Health Organization *et al.* (2005) *Scaling-Up HIV Testing and Counselling Services*, World Health Organization.
- World Health Organization (2007) *Guidance on provider-initiated HIV testing and counselling in health facilities*, Health (San Francisco).
- World Health Organization (2018) *Frequently asked questions- In vitro diagnostics and laboratory technology*, World Health Organization. Available at: <http://www.who.int/suggestions/faq/en/> (Accessed: 25 May 2018).
- Van Wyk, B. (2003) *Dark Side of the Rainbow: The Impact of HIV/AIDS on the African Renaissance*, *outh African History Online*. Centre for the Study of AIDS. Available at: <http://www.sahistory.org.za/topic/impact-colonialism> (Accessed: 14 May 2018).
- Young, S. D. and Bendavid, E. (2010) ‘The relationship between HIV testing, stigma, and health service usage’, *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*, 22(3), pp. 373–380. doi: 10.1080/09540120903193666.
- Young, S. D., Nussbaum, A. D. and Monin, B. (2007) *Potential moral stigma and reactions to*

sexually transmitted diseases: Evidence for a disjunction fallacy, *Personality and Social Psychology Bulletin*. doi: 10.1177/0146167207301027.

Zungu, B. and Sanni, L. (2011) 'Acceptance and uptake of voluntary HIV testing among healthcare workers in a South African public hospital. TT -', *South African Family Practice*, 53(5), pp. 488–494. Available at:

<http://www.safpj.co.za/index.php/safpj/article/download/1665/2787>.

Annexure 1: Annexure 1: BREC ethical approval



09 October 2017

Dr S Balwanth (217047392)
Discipline of Dentistry
School of Health Sciences
College of Health Sciences
sonambalwanth7@gmail.com

PROTOCOL: Rapid HIV testing in the dental practice- An investigation into the perceptions and attitudes of dental health care workers and patients in the eThekweni district, South Africa.
Degree: MMedSc
BREC Ref No: BE400/17

EXPEDITED APPROVAL

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application received on 22 June 2017.

The study was provisionally approved pending appropriate responses to queries raised. Your response received on 02 October 2017 to BREC letter dated 28 September 2017 have been noted by a sub-committee of the Biomedical Research Ethics Committee. The conditions have now been met and the study is given full ethics approval and may begin as from 09 October 2017.

This approval is valid for one year from 09 October 2017. To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be RATIFIED by a full Committee at its next meeting taking place on 14 November 2017.

We wish you well with this study. We would appreciate receiving copies of all publications arising out of this study.

Yours sincerely

Professor J Tsoka-Gwegweni
Chair: Biomedical Research Ethics Committee

cc supervisor: singshen@ukzn.ac.za
cc postgraduate administrator: nenepl@ukzn.ac.za

Biomedical Research Ethics Committee
Professor J Tsoka-Gwegweni (Chair)
Westville Campus, Govan Mbeki Building
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Website: <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>



Annexure 2: BREC approval for title amendment



17 July 2018

Dr S Balwanth (217047392)
Discipline of Dentistry
School of Health Sciences
College of Health Sciences
sonambalwanth7@gmail.com

Dear Dr Balwanth

PROTOCOL: Rapid HIV testing in the dental practice- An investigation into the perceptions and attitudes of dental health care workers and patients in the eThekweni district, South Africa.
Degree: MMedSc
BREC Ref No: BE400/17

NEW TITLE: Voluntary Counselling and Testing for HIV in the dental clinical setting: Knowledge, attitudes, perceptions and practices of oral health care workers in the eThekweni District, Durban, South Africa

We wish to advise you that your application for Amendments to change the title to the above has been noted and approved by a sub-committee of the Biomedical Research Ethics Committee.

The committee will be notified of the above approval at its next meeting to be held on 14 August 2018.

Yours sincerely


PPA Prof V Rambiritch
Chair: Biomedical Research Ethics Committee

cc supervisor: singshen@ukzn.ac.za
cc postgraduate administrator: nene1@ukzn.ac.za

Annexure 3: KZN Department of Health approval



health
Department:
Health
PROVINCE OF KWAZULU-NATAL

330 Langalibalele street,
Private Bag X9051 PMB, 3200
Tel: 033 395 2805/3189/3123 Fax: 033 394 3782
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DIRECTORATE:
Health Research & Knowledge
Management (HKRM)

**Reference: HRRKM352/17
KZ_201709_002**

26 September 2017

Dear Dr S Balwanth
(University of KwaZulu-Natal)

Subject: Approval of a Research Proposal

1. The research proposal titled '**RAPID HIV TESTING IN THE DENTAL PRACTICE-AN INVESTIGATION INTO THE PERCEPTIONS AND ATTITUDES OF DENTAL HEALTH CARE WORKERS AND PATIENTS IN THE ETHEKWINI DISTRICT, SOUTH AFRICA**' was reviewed by the KwaZulu-Natal Department of Health (KZN-DoH).

The proposal is hereby **approved** for research to be undertaken at Wentworth, Addington, King Dinuzulu, Prince Mshiyeni Memorial, R.K. Khan & Clairwood Hospitals and also Cato Manor, KwaMashu, Phoenix, KwaDabeka, Hlengisizwe, Inanda & Tongaat Community Healthcare Centers.

2. You are requested to take note of the following:
 - a. Make the necessary arrangement with the identified facilities 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 hkrm@kznhealth.gov.za

For any additional information please contact Ms G Khumalo on 033-395 3189.

Yours Sincerely

Mr J Govender

Chief Director: Health Service Planning, Monitoring & Evaluation

Fighting Disease, Fighting Poverty, Giving Hope

26/09/17

Annexure 4: KZN DoH recommended health facilities in eThekweni



health
Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE CORPORATE SERVICES
ETHEKWINI HEALTH DISTRICT OFFICE

83 King Cetshwayo Highway
Mayville, Durban, 4001
Tel: 031 240 5455 Email: avashri.harrichandparsad@kznhealth.gov.za
www.kznhealth.gov.za

08 August 2017

Dear Dr. S Balwanth

Re: Permission To Conduct Research at eThekweni District Facilities.

This letter serves to confirm that your application to conduct the research study titled: "Rapid HIV testing in the dental practice-an investigation into the perceptions and attitudes of dental health care workers and patients in the eThekweni district, South Africa " in the eThekweni district at the following health care facilities has been recommended:

1. Wentworth Hospital
2. Addington Hospital
3. King Dinizulu Hospital
4. Prince Mshyeni Hospital
5. R.K Khan Hospital
6. Clairwood Hospital
7. Cato Manor CHC
8. Kwa Mashu CHC
9. Pheonix CHC
10. KwaDebeka CHC
11. Hlengisiwe CHC
12. Inanda CHC
13. Tongaat CHC

Kindly upload this letter together with your application as required to the Health Research and Knowledge Unit for the KZN Department of Health for Approval. Please also note the following:

1. This research project should only commence after final approval by the KwaZulu-Natal Health Research and Knowledge Unit, and full ethical approval, has been granted,
2. That you adhere to all the policies, procedures, protocols and guidelines of the Department of Health with regards to this research.
3. All research activities must be conducted in a manner that does not interrupt clinical care at the health care facility,
4. Ensure that this office is informed before you commence your research
5. The District Office/Facility will not provide any resources for this research
6. All logistical details must be arranged with the CEO/medical manager /operational manager of the facility,
7. You will be expected to provide feedback on your findings to the District Office/Facility

Yours sincerely

Dr. A. Harrichandparsad
pp Ms. T. P. Msimango
Chief Director (Acting)
eThekweni Health District

Fighting Disease, Fighting Poverty, Giving Hope

Annexure 5: Research information sheet

RESEARCH TOPIC:

Voluntary Counselling and Testing for HIV in the dental clinical setting: Knowledge, attitudes, perceptions and practices of oral health care workers in the eThekweni District, Durban, South Africa.

The objective of this study is to find out how Dental health care workers, patients and the eThekweni health manager feel about extending HIV testing to the dental clinics and private dental practices.

HIV/AIDS has affected millions of people world-wide. South Africa has one the highest number of infected people in the world. KwaZulu-Natal has the highest HIV rate among its youth. Most people are aware of the well-known HIV testing institutions, such as the district hospitals, clinics or private general practitioner. However, people do not usually think of the dental practice or department as a place to get tested for HIV, even though thousands of patients attend private dental practices, public dental clinics or dental departments in hospitals.

HIV can cause many mouth diseases and sores that are noticed by dental health care workers, who then refer patients for HIV testing to a clinic or hospital which may be located far away resulting in delayed or no access to treatment, which leads to suffering and in some cases death.

Therefore, this research study aims to find out how does the public feel about having another venue for HIV testing. If Rapid HIV testing is performed at the dental workplaces, the public will benefit by getting tested quicker, diagnosed earlier and starting treatment quicker. This will ensure a longer, healthier life for those infected and help in the prevention and promotion of HIV. There are many private dental practices in eThekweni, which makes it more convenient and nearer for patients to access and have their HIV tests done. This would cut down on public transport costs to clinics or hospitals which are far away.

The eThekweni Department of Health also benefit from extending HIV testing to the dental workplace. More people will be encouraged to get tested and start treatment if necessary, which assists the Department of Health to meet their National core standards which is to reduce the impact of HIV/AIDS on South Africa's population and improve service delivery to the people of eThekweni.

By extending HIV testing to the dental workplace, the dental health care worker also benefits by becoming a key player in providing primary health care and expands their role in diagnosis and prevention of HIV.

The results from this study will be used to make recommendations and suggestions to put forward to the eThekweni Department of Health that will allow for HIV testing to be carried out at dental practices in the private and public dental workplaces.

This study involves 100 dental health care workers and 250 patients in the eThekweni district who are invited to participate by completing a questionnaire that will take approximately 15 minutes. The eThekweni Department of Health manager will also be invited to participate by means of a face to face interview which will take approximately one hour.

The study is funded by the researcher (Dr Sonam Balwanth) and the participants will not be responsible for any costs. The study will be carried out with a high level of respect for the participants and their ethical rights. Participation to this study is completely voluntary and there will be no reimbursement or incentives for participation. The participant's details will be kept confidential by the use of code numbers to ensure the participants remain anonymous. The researcher may not use all participant's information if the participant does not have any data for the study.

The collected data and results will be made available to participants for confirmation, and all data collected will be kept in a safe, lockable cupboard at University of KwaZulu-Natal, faculty of Dentistry.

The study has been provisionally reviewed and approved by the UKZN Biomedical Research Ethics Committee.

Thank you

In the event of any problems or concerns/questions you may contact the researcher at:

STUDENT: Dr Sonam Balwanth

Cell: 0733511128

E-mail: sonambalwanth7@gmail.com



SUPERVISOR: Prof Shenuka Singh

Discipline of Dentistry: School of Health Sciences; University of KwaZulu-Natal

Tel: 031-2426214

Fax: 031-2608069

Cell: 0738417384

E-mail: singhshen@ukzn.ac.za



UKZN Biomedical Research Ethics Committee, contact details, as follows:

Biomedical Research Administration,

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

Kwazulu-Natal, South Africa

Tel: 27 31 260 4769

Fax 27 31 260 4609

E-mail: BREC@ukzn.ac.za

Annexure 6: Invitation letter to oral health care workers to participate in research study

Dear Dental Health care provider,

Re: Invitation to participate in research study

I, Dr Sonam Balwanth am a dentist in eThekwini and Masters of Medical Sciences student at the University of KwaZulu-Natal. I believe that research is the single most important tool that will bring about change and improvement to the health sector and thus I would like and appreciate the opportunity to find solutions or methods to address these problems rife to the communities around us.

HIV/AIDS is a world-wide disease that greatly affects South Africa, especially Kwa-Zulu Natal with the highest HIV prevalence among its youth. Patients and health care providers are often aware of HIV testing institutions, such as the district hospital, clinic or private general practitioner. The dental practice, however, is not typically viewed as a testing site, although many thousands of patients attend private dental practices, public dental clinics or dental departments in hospitals. There are many HIV associated oral lesions that are often noted by dental workers who then refer patients for testing, a service which may not always be provided at the same or nearby location, resulting in delayed or no access to treatment and eventually suffering and death.

The purpose of this study is to make recommendations to put forward to the eThekwini department of health that will enable opportunistic HIV testing to be carried out at dental practices in the private and public dental workplaces; and also enable implementation of HIV testing training to all health care providers at an undergraduate level in order to promote HIV testing awareness and aid in curbing the HIV/AIDS crisis in Kwa-Zulu Natal. Should the recommendations be implemented, not only does the patient benefit, but so does the dental health care provider as those dental health care providers choosing to offer opportunistic HIV testing will gain more recognition and possible financial gain, as well as aid the government in meeting the National core standards.

My research study involves investigating the perceptions and attitudes of dental health care workers, their patients in both the private and public dental sectors and the eThekwini health manager regarding rapid HIV testing in the dental workplace. The vision and purpose of this study is to develop a policy that extends HIV testing to the dental workplace and enables implementation of HIV-testing training to all oral health care providers at an undergraduate level in order to promote HIV testing and aid in curbing the HIV/AIDS crisis in Kwa-Zulu Natal.

This study is expected to enrol 100 oral health care workers and 250 patients in the eThekwini district to participate in a self-administered questionnaire and a face to face interview with the eThekwini Department of Health manager.

The duration of completion of questionnaires is expected to be approximately 15 minutes. The study is funded by the researcher (Dr Sonam Balwanth) and no costs will be incurred by participants. A high standard of ethical principles will be upheld at all times through the duration of the study. Participation to this study is completely voluntary and there will not be any reimbursement or incentives for participation. The participants will be assured of confidentiality by the use of code numbers to ensure anonymity in the study. The researcher may terminate participation if the participant does not have any data for the study.

The collected data and results will be made available to participants for confirmation, and all data collected will be kept in a safe, lockable cupboard at University of KwaZulu-Natal, faculty of Dentistry.

Your valuable participation in this study will be of great benefit to the health sector in bringing about change for the betterment of the people that reside in eThekweni.

The study has been provisionally ethically reviewed and approved by the UKZN Biomedical Research Ethics Committee.

Thank you

In the event of any problems or concerns/questions you may contact the researcher at:

STUDENT: Dr Sonam Balwanth



Cell: 0733511128

Email: sonambalwanth7@gmail.com

SUPERVISOR: Prof Shenuka Singh



Discipline of Dentistry: School of Health Sciences; University of KwaZulu-Natal

Tel: 031-2426214

Fax: 031-2608069

Cell: 0738417384

E-mail: singhshen@ukzn.ac.za

Tel: 27 31 260 4769

Fax 27 31 260 4609

Or

UKZN Biomedical Research Ethics Committee, contact details, as follows:

Biomedical Research Administration,

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

Kwazulu-Natal, South Africa

Tel: 27 31 260 4769

Fax 27 31 260 4609

E-mail: BREC@ukzn.ac.za

Annexure 7: Invitation letter eThekwini DoH Chief Director to participate in research study

2 Aberfoyle Road
Westville North
3629

Date: 02 August 2017

Dear Madam

RE: Invitation to participate in a research study in eThekwini district

I, Dr Sonam Balwanth am a dentist in eThekwini and Masters of Medical Sciences student at the University of KwaZulu-Natal. I believe that research is the single most important tool that will bring about change and improvement to the health sector and thus I would like and appreciate the opportunity to find solutions or methods to address these problems rife to the communities around us.

My research study involves investing the perceptions and attitudes of dental health care workers and their patients in both the private and public dental sectors regarding rapid HIV testing in the dental workplace. The vision and purpose of this study is to develop a policy that extends HIV testing to the dental workplace and extends HIV-testing training to all oral health care providers at an undergraduate level in order to promote HIV testing and aid in curbing the HIV/AIDS crisis in Kwa-Zulu Natal.

The aim of this study is to identify the perceptions and attitudes of dental health care workers and their patients on extending HIV testing to the dental workplace, so that recommendations can be designed and submitted to the government for consideration and implementation.

This study is expected to enrol 100 oral health care workers and 250 patients in the eThekwini district to participate in a self-administered questionnaire and a face to face interview with the eThekwini Department of Health manager. I humbly request for your permission to record the interview for accurate documentation of valuable information.

The duration of the interview will be approximately one hour. The study is funded by the researcher (Dr Sonam Balwanth) and no costs will be incurred by participants. A high standard of ethical principles will be upheld at all times through the duration of the study. Participation to this study is voluntary and there will not be any reimbursement or incentives for participation. The participants will be assured of confidentiality by the use of code numbers to ensure anonymity. The researcher may terminate participation if the participant does not have any data for the study. The collected data and results will be made available to participants for confirmation, and all data collected will be kept in a safe, lockable cupboard at University of KwaZulu-Natal, faculty of Dentistry.

Your valuable participation will be greatly appreciated.

The study has been ethically reviewed and provisionally approved by the UKZN Biomedical Research Ethics Committee.

Thanking you

In the event of any problems or concerns/questions you may contact the researcher at:

STUDENT: Dr Sonam Balwanth:
Cell: 0733511128;
E-mail: sonambalwanth7@gmail.com



SUPERVISOR: Prof Shenuka Singh



Discipline of Dentistry: School of Health Sciences; University of KwaZulu-Natal
Tel: 031-2426214
Fax: 031-2608069
Cell: 0738417384
E-mail: singhshen@ukzn.ac.za
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Or

UKZN Biomedical Research Ethics Committee, contact details, as follows:
Biomedical Research Administration,
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
Kwazulu-Natal, South Africa
Tel: 27 31 260 4769
Fax 27 31 260 4609
E-mail: BREC@ukzn.ac.za

Annexure 8: English version of consent letter to participate in research study for all participants

I _____ have been informed about the study entitled “Rapid HIV testing in the dental workplace-An investigation into the perceptions and attitudes of dental health care workers and patients in the eThekweni district, South Africa.”

I understand the purpose and the procedures of the study.

I have been given the opportunity to ask questions about the study and have received answers to my satisfaction.

I declare that my answers to the questionnaire are honest and unbiased.

I understand that there is no remuneration or incentives for participation.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time by notifying the researcher and sign if I no longer wish to participate.

I have been assured that data collected for the study will be kept in a safe lockable cabinet at University of KwaZulu-Natal, faculty of Dentistry.

I understand that the researcher may terminate my participation if I do not have any data for the study.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at:-

STUDENT: Dr Sonam Balwanth
Cell: 0733511128
E-mail: sonambalwanth7@gmail.com
SUPERVISOR: Prof Shenuka Singh
Cell: 073 841 7384
E-mail: singhshen@ukzn.ac.za.

If I have any questions or concerns about my rights as a study participant or if I am concerned about an aspect of the study or the researchers then I may contact:

Biomedical Research Administration,
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban, 4000
Kwazulu-Natal, South Africa
Tel: 27 31 260 4769
Fax 27 31 260 4609
E-mail: BREC@ukzn.ac.za

Signature of participant _____	Date _____
Signature of witness _____	Date _____
Signature of translator _____	Date _____
Signature for consent to recording _____	Date _____
Signature in case of withdrawal _____	Date _____

Annexure 9: Interview schedule for Chief Director of eThekweni Department of Health

Questions

1. Please can you highlight the Department of Health's strategy on HIV testing, specifically the use of rapid testing and strategic plans for promoting HIV testing.
2. Do you believe that the dental clinic provides an opportunity where HIV testing, such as rapid testing can be done?
3. Would a policy change be required to facilitate such a process?
4. Would the Department of Health be willing to invest in such a project (in terms of funding for training of staff)?
5. What would be some of the challenges/constraints in conducting HIV testing in the dental clinic?
6. Would the Department of Health be willing to implement compulsory HIV testing training to all undergraduate Health students?
7. Given that the Department of Health is a regulator of the private sector, how would policy and planning within the health system take into account the possibility of extending HIV testing into private dental practices? Will there be a need for registered dental practitioners to be accredited with formal training in HIV testing? What other factors need to be considered?
8. Are there any further comments that you would like to add?

Annexure 10: English version of questionnaire

Questionnaire for the Dental Health Care Provider

Kindly fill in the questionnaire. Thank you for valued participation in this research study.

Research Topic: Rapid HIV testing in the dental workplace-An investigation into the perceptions and attitudes of dental health care workers and patients in the eThekweni district, South Africa.

Guidance for completing the questionnaire

1. Please make a tick or a cross (X) next to your chosen answer and add explanation where necessary.
2. Please use N/A for not applicable questions to avoid skipping questions.

1. PARTICIPANTS BIOGRAPHICAL DATA

Please tick or make a cross (X) in the box that corresponds with your answer:

1. What is your gender?

Male	
Female	

2. What age group do you belong to?

23-28 years old	
29-34 years old	
35-40 years old	
41> years old	

3. What is your profession?

Dental therapist	
Dental surgeon	
Oral hygienist	
Dental specialist	

4. Where do you work?

Private Dental Practice	
Dental department in Public Hospital	
Dental department in Public Clinic	
Other (Mobile clinics)	

5. How many years of work experience do you have since qualifying?

1-5 years	
6-10 years	
11-15 years	
>15 years	

6. How many patients do you see on a weekly basis?

<50	
50-100	
101-150	
>150	

2. HIV RELATED ATTITUDES, PERCEPTION AND HIV KNOWLEDGE

7. Have you received training in HIV testing? If YES, please indicate where you were trained.

Yes	
No	

Where? _____

8. Do you think that it is necessary for dental health care providers be trained for HIV testing and counselling at undergraduate level?

Yes	
No	

9. On a monthly basis, how many patients do you see with possible HIV associated oral lesions?

<5	
6-10	
11-15	
>15	

10. Which are the most common oral manifestations of HIV have you noticed? (can tick more than one option)

Oral Candidiasis	
Human papilloma virus lesions	
Varicella Zoster lesions	
Hairy leukoplakia	
Necrotising ulcerative Periodontitis	
Kaposi Sarcoma	
Herpes Simplex virus lesions	
Necrotising Ulcerative gingivitis	
Lymphoma	

11. On a monthly basis, how many patients have you referred for an HIV test in your dental workplace?

<5	
6-10	
11-15	
>15	

12. Do you test for HIV at your dental workplace?

Yes	
------------	--

No	
----	--

13. Please complete the following: HIV can be tested by obtaining the patient's:

	Yes	No	Not Sure
Blood sample			
Saliva sample			
Urine sample			
Other			

14. Rapid HIV testing has been introduced in developing countries with limited resources and infrastructure as an alternate method to the conventional HIV testing. Have you heard of rapid HIV testing?

Yes	
No	

15. In your opinion, rapid testing is:

	Yes	No	Unsure
a) Cheaper than the conventional testing?			
b) Quicker than the conventional testing?			
c) Less invasive?			

d) Useful in areas with minimal infrastructure?			
e) As accurate as ELISA and Western blot?			

16. Do you think routine HIV testing in the dental setting is a good idea?

Yes	
No	

Please explain

further: _____

17. Do you have sufficient staff to carry out rapid HIV testing as well as pre-test and post-test counselling in your workplace?

Yes	
No	

18. Please indicate your answer by ticking the most appropriate box for each statement.

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
By extending HIV testing to my dental workplace, patients have a better chance of seeking medical attention if necessary					
Rapid HIV testing in my dental workplace can be done as long as it is quick and cost effective					
HIV testing in my dental workplace will create awareness and encourage other patients to test as well					
Rapid HIV testing in my dental workplace should be done only if staff are adequately trained					

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
I feel dental health care workers will be given more recognition and importance as primary health care providers if HIV testing is implemented in the dental workplace					
Extending HIV testing to my dental workplace will result in less discrimination of patients that want to test for HIV					
I feel if HIV testing is implemented in my dental workplace, there is a risk of me being held responsible for any false results					
Dental health care workers and staff are not trained to perform HIV testing at undergraduate level					

	Strongly Agree	Agree	Unsure	Disagree	Strongly disagree
HIV testing may have a potential negative impact on my dental workplace with regards to infection control practices being questioned by other patients					
There is inadequate or no reimbursement from government or medical aid schemes for HIV testing in the dental workplace					
The HIV rapid test will require time to carry out, resulting in a back log of patients in the public sector and loss of income for independent private oral health care providers					
I feel HIV testing is a practice out of the scope of dentistry and should only be done by medical doctors and nurses					

3. ORAL HEALTH CARE WORKER’S ATTITUDES AND PERCEPTIONS ON HIV TESTING IN THE DENTAL WORKPLACE

19. Please indicate your answer by ticking the most appropriate box for each statement.

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
I feel testing for HIV in the dental workplace is a waste of medical resources and time as few HIV positive people will actually start treatment					
As a dental health care worker, I am not keen on testing for HIV as I feel I could be at risk for contracting the virus					
I do not have training for counselling before and after HIV testing					

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
As a dental health care worker, I would like to eliminate shame and rejection associated with HIV and AIDS and bring awareness to opportunistic HIV testing in the dental workplace					
I have observed my colleagues openly discuss and discriminate against patients living with HIV and AIDS and therefore do not want to test for HIV in my dental workplace					
I feel HIV positive people are a financial drain on the country's economy and therefore I do not want to test for HIV in my dental workplace					

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
As a dental health care worker, I should have a choice whether I want to test for HIV in my workplace or not					
I do not feel comfortable testing a suspected HIV positive patient					
HIV testing in the dental workplace should only be done if it is enforced by the government as an official policy					

20. Would you implement HIV testing in your dental workplace?

Yes	
No	

Please explain

further: _____

21. If HIV testing is implemented in the dental workplace, who should ideally cover the cost?

The patient	
The government	

22. Are you willing to undergo rapid HIV testing training workshops?

Yes	
No	

Please explain further:

Annexure 11: isiZulu information sheet

ISIHLOKO SOCWANINGO:

UKUHLOLWA KWE HIV OKU SHESHAYO ENDAWENI YAMAZINYO – UCWANINGO EKWAZINI NASEKUQONDENI KWABASEBENZI KANYE NEZI GULI KWI DISTRICT YAS ETHEKWINI, NINGIZIMU AFRIKA.

Inhloso yalolu cwaningo ukuthola ukuthi abasebenzi base maziny'weni, iziguli Kanye nomphathi womnyango wezempilo wase thekwini bezwa kunganjani ukulula ukuhlolwa kwe HIV eclinic yamazinyo Kanye nasezi ndaweni ezizi mele zamazinyo.

I-HIV/AIDS isi thikameze izigidi zabantu emhlabeni jikelele. Iningizimu afrika inezi balo ezi phezulu zabantu aba thikamezekile emhlabeni. I Kwa-Zulu Natal inezi balo ezi phezulu zentsha. Abantu abaningi bayazi ngezi khungo ezaziwayo zokuhlolola i-HIV, njengezi bhedlela zika hulumeni, ama clinic noma abasebenzi bezempilo abazimele. Kodwa, abantu abavamisile ukucabanga ngezi ndawo zamazinyo ezizimele noma ezika hulumeni njenge ndawo yokuhlolola i-HIV, noma izinkulungwane zeziguli eziya ezibhedlela zamazinyo ezizimele noma emaclicinic ahulumeni noma ezibhedlela ezika hulumeni.

i-HIV ingadala izifo eziningi zomlomo Kanye nezilonda ezibonwa abasebenzi basema zinyweni, aba thumela iziguli ukuyo hlolwa eclinic noma esibhedlela ukungenzeka sibe kude ekuholela ekutheni kubambezeleke noma ekutheni inga tholakali imishanguzo, oku holela ekuguleni Kanye nase kufeni kokunye.

Ngakho ke lolu cwaningo luhlose ukutghola ukuthi umphakathi uzizwa kanjani ngokuba nenye indawo yokuhlola i-HIV. Uma ukuhlolwa kwe HIV okusheshayo kwenziwa ezindaweni zamazinyo, umphakathi uzohlomula ngoku hlolwa ngokushesha, kutholakale imiphumela futhi uthole ukulashwa ngokushesha. Lokhu kuzoqikelela impilo ende kulabo abathintekayo bese kusiza ekugwemeni koku sabalala kwe HIV.ziningi izindawo zamazinyo ezizi mele eThekwini, okukwenza kube lula futhi kube seduze kwiziguli ukuba zikwazi ukuhlolola i-HIV. Lokhu kuzonciphisa izindleko kwe zokuthutha zomphakathi zokuya ema clinic noma ezibhedlela ezikude.

Umnnyango wezempilo was eThekwini nawo uyasizakala ekusabalalisweni kokuhlololwa i-HIV ema clinic nase zibhedlela zamazinyo. Abantu abaningi bazo gququzeleka ukuyo hlola bese beqala ukuthatha imishanguzo uma kunesidingo, okusiza umnyango wezempilo ufike emigomweni yawo ebekiwe okunguku nciphisa umthelela we HIV/AIDS ezibalweni zeNingizimu Afrika futhi kuthuthukise eku fezwani kwezidingo kubantu base Thekwini.

Ngokulula ukuhlolola i-HIV ema clinic nase zibhedlela zamazinyo, umsebenzi wase mazinyweni uzothola ukuhlomula ngokuba ngumuntu obamba iqhaza ekulethweni kosizo lwezempilo futhi kulule indima yabo ekutholeni imiphumela naseku gwemeni i-HIV.

Imiphumela yalolu cwaningo izosetshenziswa ukuthola izindlela nemibono ezo yiswa phambili kumnyango wezempilo eThekwini okuzovumela ukuhlololwa kwe HIV kuqhubekele phambili

ema clinic amazinyo nase zibhedlela zamazinyo ezizimele Kanye nase ma-clinic amazinyo nase zibhedlela zamazinyo zika halumeni.

Lolu cwaningo lubandakanya abantu abangu 100 abasebenza emazinyweni Kanye neziguli ezingu 250 kwi district yase Thekwini abamanyiwe ekuba basize ngoku phendula imibuzo okuzo thatha imizuzu engu 15. Nompfathi womnyango wezempilo wase Thekwini uzomenywa abekhona asize ngoku phendula imibuzo okuzo thatha u-1 hour.

Lolu cwaningo luxhaswe ngu mseshi (Dr Sonam Balwanth) futhi abasizile noma abaphendulile ngeke bakhokhe lutho. Ucwawingo luzo qhutshwa ngendlela esezingeni elihloniphekile kubantu abasizile ngoku phendula imibuzo Kanye nama lungelo abo. Ukubandakanyeka kwakho kulolu cwawingo kunguku volontita futhi angeke kube khona ngoku siza kwakho. Imininingwano yo bandakanyekayo angeke ivezwe kuzo setshenziswa izi number ukuqiniseka othintekayo akavezwa. Umseshi angeke asebenzise lonke ulwazi lothintekayo uma engenalo ulwazi ngocwaningo.

Ulwazi oluqoqiwe Kanye nemiphumela kuzo kwenziwa kube khona ko thintekayo uku qiniseka, futhi lonke ulwazi oluqoqiwe luzogcinwa luphephile, kwi khabethe eli khiywayo eNyuvesi yaKwa Zulu Natal, emkhakheni wamazinyo.

Ucwawingo lubhekiwe lavunywa i-UKZN Biomedical Research Ethics Committee.
Siyabonga.

Esigamekweni lapho uhlangabezana nezinkinga noma uneminye imibuzo ungathintana nomseshi ku:

STUDENT: Dr Sonam Balwanth

Cell: 0733511128

Email: sonambalwanth7@gmail.com



SUPERVISOR: Dr Shenuka Singh

Discipline of Dentistry: School

of health Sciences; University of KwaZulu-Natal

Tel: 031-2426214

Fax: 031-2608069

Cell: 0738417384

E-mail: singhshen@ukzn.ac.za

UKZN Biomedical Research Ethics Committee, contact details, as follows:

Biomedical Research Administration,

Research Office, Westville Campus, Govan Mbeki Building

Private Bag X 54001

Durban

4000

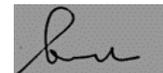
KwaZulu-Natal, South Africa

Fax: 27 31 260 4609

E-mail: BREC@ukzn.ac.za

Tel: 27 31 260 4769

Fax: 27 31 260 4609



Annexure 12: isiZulu consent letter to participate in research study

Mina _____ ngazisiwe ngocwaningo olubizwa “Ukuhlolwa kwe HIV OKUSHESHAYO e clinic yamazinyo/ esibhedlela samazinyo- uCwaningo ekwazini nasekuqondeni kwabasebenzi kanye nezi guli kwi district yase Thekwini, Ningizimu Afrika.”

Ngiyayi qonda imithetho nemi gomo yalolu cwaningo.

Nginikeziwe ithuba loku buza imibuzo ngalolu cwaningo futhi ngizitholile izimpendulo zangigculisa.

Ngiya funga ukuthi izimpendulo zami kulemibuzo ziyiqiniso futhi azi chemile.

Ngiyaqonda ukuthi akukho mali noma ngoku siza kwami kulolu cwaningo.

Ngiyafunga ukuthi uku siza kwami kulolu cwaningo kunguku volontiya futhi nginga hoxa ngesikhathi sami ngokwazisa umseshi futhi ngisayine uma ngingasafisi uku siza.

Nginikiwe isiqiniseko sokuthi ulwazi oluqoqiwe luzogcinwa luphephile, kwi khabethe eli khiywayo eNyuvesi yaKwa Zulu Natal, emkhakheni wamazinyo.

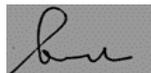
Ngiya qonda ukuthi umseshi angaku hoxisa ukubandakanyeka kwami kulolu cwaningo uma engenalo ulwazi lo cwaningo.

Uma ngineminye imibuzo noma ngidinga ulwazi mayelana nocwaningo ngiya qonda ukuthi nginga thintana nomseshi ku:-

STUDENT: Dr Sonam Balwanth:
Cell: 0733511128
E-mail: sonambalwanth7@gmail.com



SUPERVISOR: Prof S. Singh:
Cell: 0738417384
E-mail: singhshen@ukzn.ac.za
Biomedical Research Administration,
Research Office, Westville Campus, Govan Mbeki Building
Private Bag X 54001
Durban, 4000
KwaZulu-Natal, South Africa
Tel: 27 31 260 4769- Fax: 27 31 260 4609
E-mail: BREC@ukzn.ac.za



Signature of participant	_____	Date _____
Signature of witness	_____	Date _____
Signature of translator	_____	Date _____
Signature for consent to recording	_____	Date _____
Signature in case of withdrawal	_____	Date _____

Annexure 13: isiZulu version of questionnaire

Sicela u phendule imibuzo. Siyabonga ukuhlanganyela kwakho kulolu cwaningo.

Isihliko socwaningo: ukuhlolwa kwe HIVoku sheshayo endaweni yoku Sebenza yamazinyo-ucwaningoo ekwazini nase kuqondeni kwaba sebenzi base maziny'weni kwi district yase Thekwini, Ningizimu Afrika.

Indlela yoku phendula lemibuzo

1. Sicela u make () noma ufake u cross (X) eduze kwempendulo oyi khethile, bese ufaka isizathu lapho kudingeka khona.
2. Ufake u N/A kwimibuzo lapho ingekho impendulo yakhona ukugwema ikweqa imibuzo.

1. Imininingwane

Sicela u make () noma ufake u cross (X) ebhokisini elihambisana nempendulo oyi khethile:

1. Buyini ubulili bakho?

Male	
Female	

2. Uneminyaka emingaki?

23-28 years old	
29-34 years old	
35-40 years old	
41> years old	

3. Uyini umsebenzi wakho?

Dental therapist	
Dental Sugeon	
Oral hygienist	
Dental specialist	

4. Usebenza kuphi?

Private Dental Practice	
Dental Department in Public Hospital	
Dental Department in Public clinic	
Other (Mobile Clinics)	

5. Usunemi nyaka emingaki yolwazi lomsebenzi oqeqeshelwe wona?

1-5 years	
6-10 years	
11-15 years	
>15 years	

6. Ubona iziguli ezingaki nge sonto?

<50	
50-100	
101-150	
>150	

2. UKUHLOBANA KWE HIV UKU CABANGA,UKUQONDA KANYE NOLWAZI NGAYO.

7. Ubuke wathola uqeqesho lokuhlola i-HIV? Uma kungu Yebo, sicela ubhale indawo owa qeqeshelwa kuyo.

Yebo	
Cha	

Kuphi? _____

8. Ucabanga ukuthi sikhona isidingo sokuthi abasebenzi bezempilo base maziny'weni ba qeqeshelwe ukuhlola i-HIV kanye ne counselling emazingeni aphantsi?

Yebo	
Cha	

9. Ngenyanga, zingaki iziguli ozibonayo ukuthi kungenzeka zibenayo inkinga yomlomo ehlobene ne-HIV.

<5	
6-10	
11-15	
>15	

10. Ikuphi okujwayelekile oku hlobene ne HIV osuke wakubona? (ungamaka kube ngaphezulu koku kodwa)

Oral Candidiasis	
Human papilloma virus lesions	
Varicella Zoster lesions	
Hairy leukoplakia	
Necrotising ulcerative Periodontitis	
Kaposi Sarcoma	
Herpes Simplex virus Lesions	
Necrotising Ulcerative gingivitis	
Lymphoma	

11. Ngenyanga, zingaki iziguli ozidlulisele ukuyo hlolela i-HIV e clinic yamazinyo/ esibhedlela samazinyo?

<5	
6-10	
11-15	
>15	

12. Uya hlolela i-HIV e clinic yamazinyo/ esibhedlela samazinyo?

Yebo	
Cha	

13. Sicela ugcwalise okulandelayo: i-HIV ingahlolwa ngoku thatha esigulini:

	Yebo	Cha	Anginas'qiniseko
i-sample yegazi			
i-sample yamathe			
i-sample yomchamo			
Nokunye			

14. Ukuhlolwa kwe HIV kuveziwe emazweni asathuthuka nezi nsiza kusebenza ezikaliwe njengenye indlela elungile yoku hlola i-HIV. Usuke wezwa ngokuhlolwa kwe HIV oku?

Yebo	
Cha	

15.

	Yebo	Cha	Anginas'qiniseko
a) Kushibhile kunokuhlolwa okujwayelekile?			
b) Kuya shesha kunokuhlolwa okujwayelekile?			
c) Akukho nzima?			
d) Kuyasiza ezindaweni ezi nezi nsiza kusebenza ezincane?			
e) Kukhipha imiphumela ekuyi yona?			

16. Ucabanga ukuthi indlela yoku hlola i-HIV ekulungisweni kwamazinyo kungu mbono omuhle?

Yebo	
Cha	

Sicela uchaze kabanzi: _____

17. Unaso i-Staff soku qhubeka nokuhlola i-HIV kanye nokuhlola okwandulela

Yebo	
Cha	

18. Sicela ukhombise impendulo yakho ngokumaka ibhokisi ekuyilona lesi tatimende ngasinye.

	Ngiyavuma kakhulu	ngiyavuma	Anginasi qiniseko	Ngiyaohika	Ngiyaphika kakhulu
Ngoku lula ukuhlolwa i-HIV eClinic Yamazinyo/ esibhedlela samazinyo iziguli zine thuba elingcono loku funa usizo lwezempilo uma kunesidingo.					
Ukuhlolwa kwe HIV okusheshayo e clinic yamazinyo/ esibhedlela samazinyo kungenzeka uma kushesha futhi kushibhile.					
Ukuhlolwa kwe HIV e clinic yamazinyo/ esibhedlela samazinyo kuzokwakha isexwayiso futhi ku gqugquzele ezinye iziguli ukuba zihlolwe nazo.					
Ukuhlolwa kwe HIV okusheshayo e clinic yamazinyo/ esibhedlela samazinyo kumele kwenziwe uma abasebenzi beqeqeshkile.					
Ngizwa ukuthi uma abasebenzi base clinic yamazinyo / esibhedlela samazinyo bazonikwa ukunakwa noku baluleka okunqala uma uku hlolwa kwe HIV kwenziwa e clinic yamazinyo/ esibhedlela sama zinyo.					
Ukulula ukuhlolwa kwe HIV e-clinic yamazinyo/ esibhedlela samazinyo kuzoholela ekuncipheni koku kwaswa kwezi guli					

ezifuna ukhlolelwa i-HIV.					
Ngizwa engathi uma ukhlolelwa kwe HIV kuhlangezwa e-clinic yamazinyo/ esibhedlela samazinyo, kunobungozi boku ba responsele nge miphumela engasilo iqiniso.					

	Ngiyavuma kakhulu	ngiyavuma	Anginasi qiniseko	Ngiyaohika	Ngiyaphika kakhulu
Abasebenzi basemazinyweni kanye ne staff abaqeqeshelwe ukuhlola i-HIV emazingeni aphantsi.					
Ukuhlolwa kwe HIV kungaba nomthelela omubi e-clinic yamazinyo/ esibhedlela samazinyo mayelana no kwenziwa kwe- infection control, iziguli zibe nemibuzo.					
Kunoku ngaqondi noma ukungacaci kuhulumeni noma i-Medical aid scheme yoku hlolwa kwe HIV e-clinic yamazinyo/ esibhedlela samazinyo.					
Ukuhlolwa kwe HIV kuzodinga isikhathi soku qhubeka, okuholela eku qheleni kweziguli ezindaweni zomphakathi kanye nokulahleka kwemali engenayo kwi clinic yamazinyo/ esibhedlela samazinyo esizimele.					
Ngizwa engathi ukuhlolwa kwe HIV ukuzi lungiselela ngaphandle kokubukela kwi scope se dentistry futhi kumele kwenziwe odokotela no nurse.					

3. UKUHLOBANA KWE HIV, UKU CABANGA, UKUQONDA KANYE NOKUHLOLWA KWE HIVKUBA SEBENZI BASE MAZINYWENI ENDAWENI YOKUSEBENZA.

19. Sicela ukhombise impendulo yakho ngokumaka ibhokisi ekuyilona lesi tatimende ngasinye.

	Ngiyavuma kakhulu	ngiyavuma	Anginasi qiniseko	Ngiyaohika	Ngiyaphika kakhulu
Ngizwa engathi ukuhlelela i-HIV e-clinic yamazinyo/ esibhedlela samazinyo ukumosha izinsiza kusebenza kanye nesikhathi njengoba idlanzana labantu abane HIV bizoqala i-treatment.					
Njengo msebenzi wasemazinyweni anginalo ugqozu loku hlola i-HIV njengoba ngizwa engathi ngingaba sengcupheni yoku theleleka.					
Angi qeqeshekile nge HIV counselling ngaphambi nangemva kokuyihlola.					
Njengo msebenzi wasemazinyweni ngingathanda ukususa ukuzinyeza noku lahlwa okumataniswa ne HIV kanye ne AIDS ngilethe ulwazi emathubeni okulholelwa i-HIV Njengo msebenzi wasemazinyweni.					
Ngibonile abantu esisebenza nabo bekhuluma futhi begxeka abantu abaphila ne HIV kanye ne AIDS, ngakhoke angifuni ukuhlelela I HIV e-clinic yamazinyo/ esibhedlela samazinyo.					
Ngizwa engathi abantu abane HIV bayawu					

phazamisa umnotho wezwe, ngakhoke angi funi uku hlolela i-HIV Ngizwa engathi ukuhlololela i-HIV e-clinic yami yamazinyo/ esibhedlela sami samazinyo.					
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	Ngiyavuma kakhulu	ngiyavuma	Anginasi qiniseko	Nginyaohika	Ngiyaphika kakhulu
Njengo msebenzi wasemazinyweni kumele ngibe ne Choice yokuba ngihlole noma ngingayi hloli i-HIV Njengo msebenzi wasemazinyweni ngingathanda.					
Angizizwa ngiphephile uma ngizohlola umuntu okungenzeka abenayo i-HIV.					
Kuhlolwa kwe HIV e-clinic yamazinyo/ esibhedlela samazinyo kumele kwenziwe uma kuphoqwe uhulumeni ukuthi kwenziwe ngokuse mthethweni.					
e-clinic yamazinyo/ esibhedlela samazinyo					

20. Ungaku hlongoza uku hlolela i-HIV e clinic yamazinyo/ esibhedlela samazinyo?

Yebo	
Cha	

Sicela uchaze kabanzi: _____

21. Uma ukuhlolwa kwe HIV ku hlongozwa e clinic yamazinyo/ esibhedlela samazinyo, ubani okumele akhokhele izindleko?

Isiguli	
Uhulumeni	

22. Ungavuma ukuya kwi training yo kuhlola i-HIV ?

Yebo	
Cha	

Sicela uchaze kabanzi: _____

Annexure 14: Research Ethics Certificates (TRREE: Module 2.1)
Introduction to Research Ethics



Zertifikat

Certificado

Certificat

Certificate

Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale
Promoting the highest ethical standards in the protection of biomedical research participants



Certificat de formation - Training Certificate

Ce document atteste que - this document certifies that

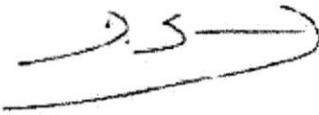
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Introduction to Research Ethics

du programme de formation TRREE en évaluation éthique de la recherche
of the TRREE training programme in research ethics evaluation

June 1, 2017
CID - 1.116x46a2


Professeur Dominique Sprumont
Coordinateur TRREE Coordinator

FMH Continuing Education Program (5 Credits)
Programme de Formation continue (5 Crédits)

FPH Continuing Education Programme
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Programme de formation continue

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Research Ethics Evaluation



Zertifikat
Certificat

Certificado
Certificate

Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale
Promoting the highest ethical standards in the protection of biomedical research participants



Certificat de formation - Training Certificate

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Research Ethics Evaluation

du programme de formation TRREE en évaluation éthique de la recherche
of the TRREE training programme in research ethics evaluation

June 1, 2017
CD : SgHUPqbaG

Professeur Dominique Sprumont
Coordinateur TRREE Coordinator



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