

An investigation into the association between perceptions of own sexual risk of HIV transmission and knowledge of HIV by healthcare workers in a health district in Botswana

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Assignment presented in partial fulfilment of the requirements for the degree of Master of Philosophy (HIV/AIDS Management) at Stellenbosch University

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March 2012**

Declaration

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Tafireyi Marukutira

January 2012

Acknowledgements

I would like to thank the following people who made this work possible directly and indirectly.

- My family, without their support this would not have been possible. I thank my wife, Priscilla, my daughter, Shaniqua and my son, Charles. Thank you for allowing time to work on this.
- A big thank you goes to the late study leader Mr Gary Eva. For setting the pace on my research project. It was all going so well and encouraging and going so well until the inevitable happened. May your soul rest in peace.
- Thank you to my study leader Prof Elza Thomsom. It was so encouraging and stimulating to work with you. Thank you for all the encouraging emails.
- To my colleague and classmate, Tsungai Chiwara, thank you for your support. To Thato Makiwa, thank you.
- The staff at Mabutsane District Health Management Team, special thanks for making this happen. Dr Kasongo and Omoz, thank you.
- And for all those who took their time to complete the questionnaire, thank you.

Abstract

This study sought to investigate associations between the perceptions of own sexual risk of HIV transmission and knowledge of HIV by healthcare workers in a health district in Botswana. The objectives of the study were to establish the level of knowledge of HIV among health care workers, to assess perception of their own risk of the infection, to establish the relationship between level of knowledge of HIV and perception of risk as well as to provide guidance on prevention strategies for health care workers. The focus of the study was on the personal life of a health care worker as opposed to occupational HIV exposure.

A cross-sectional survey was conducted using self-administered anonymous questionnaires in 32 health care workers in a health district in Botswana. There was an 80% response rate and data was analysed through descriptive statistics as well as cross tabulations.

The average knowledge of HIV among health care workers in this study was high ranging from moderate to excellent. HIV knowledge was based on its transmission, ART and HIV prevention. 78.1% of the health care workers perceived they were at risk of HIV infection in their own personal lives and this was related to high levels of knowledge related to the infection. There was some risk taking behaviour reported in this study but it was not significantly high. There were few health care workers with multiple sexual partners (15.6%) and condom use was reported at 78.1%. Health care workers accurately identified correct and consistent use of the condom as the most effective method of HIV prevention which health care workers should also use. HIV testing was reported in 93.8% of the health care workers and disclosure to sexual partners was also high at 87.5%. There were, however, some misconceptions regarding oral and anal sex with some health care workers failing to identify that oral sex is protective as opposed to the high risk anal sex. Health care workers in this study also agreed that there should be focus on health care workers but prevention strategies should be similar to the general population such as behaviour change and HIV testing.

Opsomming

Hierdie studie het gepoog om die verband tussen die persepsies van eie seksuele risiko van MIV-oordrag en kennis van MIV deur gezondheidswerkers in 'n distrik in Botswana te ondersoek. Die doelwitte van die studie was om die vlak van kennis van MIV onder gezondheidswerkers vas te stel, die persepsie van eie risiko van MIV-infeksie te evalueer, die verhouding tussen die vlak van kennis van MIV en persepsie van risiko, sowel as om leiding te verkaf vir MIV-voorkomingstrategieë vir gezondheidswerkers. Die fokus van die studie was op die persoonlike lewe van 'n gezondheidswerker in teenstelling met beroepsblootstelling aan MIV.

'n Dwarsnee-opname is gedoen, deur gebruik te maak van self-geadministreerde, anonieme vraelyste met 32 gezondheidswerkers in 'n gesondheidsdistrik in Botswana. Daar was 'n 80% responskoers en data is geanaliseer deur middel van beskrywende statistieke sowel as kruistabelle. Die gemiddelde kennis van MIV onder gezondheidswerkers in hierdie studie, was hoog. MIV-kennis is gebaseer op die MIV-oordrag en voorkoming. 78.1% van die gezondheidswerkers begryp dat by hulle 'n hoë risiko bestaan van MIV-infeksie in hulle eie persoonlike lewens en dit hou verband met hoë vlakke van MIV-kennis. Hoë risikogedrag was gerapporteer in hierdie studie, maar dit was nie noemenswaardig hoog nie. Daar was min gezondheidswerkers met seksmaats (15,6) en die gebruik van kondome is aangemeld as 78.1%. Gesondheidswerkers het die korrekte en gereelde gebruik van kondome korrek geïdentifiseer, as die mees doeltreffende metode van MIV-voorkoming, wat gesondheidswerkers ook moet gebruik. MIV-toetsing is aangemeld as 93.8% van die gesondheidswerkers en bekendmaking aan seksuele maats was ook hoog op 87.5%.

Daar is egter 'n paar wanopvattinge ten opsigte van orale en anale seks. 'n Paar gesondheidswerkers het versuim om te identifiseer dat orale seks beskermend is teenoor die hoë risiko anale seks. Gesondheidswerkers in hierdie studie het ook ooreengekom dat daar gefokus moet word op gesondheidswerkers, maar dat voorkomingstrategieë soortelyk moet wees vir die algemene bevolking soos gedragsverandering en MIV-toetsing.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The HIV epidemic continues to affect mainly the sub-Saharan African countries with HIV prevalence at 22.5 million compared to the global figure of 33.3 million people in 2009 (United Nations programme on HIV/AIDS (UNAIDS), 2010). In 2008 Botswana reported a national prevalence of 17.6% and indeed one of the countries in sub-Saharan Africa hardest hit by the epidemic (Botswana AIDS Impact Survey III (BAIS III), 2009). The epidemic peaked in 1999 globally and by 2010 the number of new infections had fallen by 19% (UNAIDS, 2010). Clearly the prevalence will continue to increase as an increasing number of people are surviving because of the increasing availability of antiretroviral therapy (ART) and a reduction in mortality; prevention remains the cornerstone of reducing the number of new infections. HIV prevention definitely works and 33 countries have recorded a decline of new infections (incidence) by more than 25% between 2001 and 2009 (UNAIDS, 2010). Botswana is not one of these countries even though 22 such countries are in sub-Saharan Africa; countries include Zambia and Zimbabwe who share borders with Botswana.

Prevention programmes continue to target at risk groups and equally important is the presence of HIV at the workplace. The reduction in the incidence of HIV has mainly been attributed due to positive behaviour change in individuals in their society. People attaching a stigma to the incidence and discrimination, lack of access to health services and ineffective laws can be contributing factors causing the epidemic to worsen (UNAIDS, 2010). This means that workplace programmes can play a role to foster behaviour change in employees.

Prevention of HIV begins with knowledge and then perception that an individual is at risk

of getting infected which leads to behaviour change. It is doubtful to have behaviour change if there is no perception from individuals of an underlying threatening risk. The Social Cognitive-Behavioural Theory (SCT) addresses both the psychological dynamics underlying behaviour and their methods of promoting behaviour change (Bandura, 1986). The Health Belief Model (HBM) in turn asserts that people will engage in preventive behaviour if they believe they are susceptible to a health condition (perceived susceptibility), they believe the condition is severe (perceived severity) and if they feel the costs of engaging in preventive behaviour are outweighed by the benefits (perceived vulnerability) (Janz & Becker, 1984). The assumption would be with information translated into knowledge where behaviour can then be changed based on the informed health beliefs. This theory has been in existence for some time now and probably works with other health conditions but not necessarily with HIV and AIDS.

In terms of knowledge about HIV and AIDS, health care workers (HCW) are exposed to extensive knowledge as well as real life situations surrounding the epidemic. Healthcare workers are basically exposed to both theoretical knowledge as well as practical life examples of HIV infection. Ideally this would translate to a positive behaviour change around HIV prevention and infections would be reduced incrementally. The level of knowledge in health care workers in reality varies depending on the cadre.

Despite the exposure to knowledge of HIV and AIDS, health care workers are not immune from HIV infection and may as any other person become stained. A very small proportion occurs as a result of the professional risk of HIV infection in HCW but the greater proportion is as a result of other modes of transmission; a 0.33% risk of HIV transmission from needle stick injury (Bartlett, Gallant and Pham, 2009). A cross-sectional anonymous HIV prevalence study was done in South Africa which showed an overall HIV occurrence of 11.5% and the highest among student nurses (13.8%) and those in the profession (13.7%) aged between 25-34 years (Connelly *et al*, 2007). A question can be posed do these HIV infections occur because the perception of risk in healthcare workers is consciously present?

1.2 Problem Statement

The occupational risk of HIV transmission is represented by only 0.33% in health care workers (Bartlett *et al*, 2009). The prevalence of HIV infection in health care workers ranges from 11.5% in Gauteng province of South Africa to 43.8% in the Tete Province of Mozambique (Connnelly *et al*, 2007; Casas *et al*, 2011). Despite the expected high HIV and AIDS knowledge level, the prevalence of the infection in health care workers is still significant. An argument can elaborate whether if it is not the occupational risk, could it be lack of own perception to risk to be infected? Only 2.5% of HIV infections among health care workers are due to needle-stick injury and this exposed the other side of the coin that can be attached to the interpretation that the majority of cases are due to unprotected sex (WHO, 2006).

It is not known what the healthcare workers perceive as their own risk to sexual HIV transmission. Therefore the research question is: What is the association of perception of own risk of sexual HIV transmission and the level of knowledge of infection amongst healthcare workers in a related district in Botswana?

1.3 Rationale of Study

It is important that the health care workforce is fit enough to contribute towards assisting in countering the HIV epidemic. Prevention strategies should be tailor made to meet the uniqueness of this target group to enable them to be active in the pursuit of their duties. While emphasizes is being placed on the identified risky groups such as commercial sex workers and the youth, there is a need to highlight that the workplace is also a source of concern and should receive due consideration. Health care workers may be a forgotten group in terms of the prevention of HIV beyond their workplace. This sentiment was echoed by Shelton (2001) in a paper on the provider perspectives advocating for attention to be paid to health care workers as well in the era of HIV and AIDS. It is known that HIV related morbidity and mortality is always preceded by long periods of reduced productivity as a result of increased illness and absenteeism especially without ART and health care workers are not spared (Shisana *et al*, 2002; Tawfik and Kinoti, 2001). Investigating the

perceptions of health care workers regarding their own sexual risk to HIV transmission, it is hoped the body of knowledge will be increased in this regard and prevention approaches and strategies can be revamped and reviewed targeting HIV at the workplace of a healthcare worker. Prevention messages can then be developed that target health care workers making them more aware of the risk and how to survive to continue with their lives and continue with a fruitful and productive career.

1.4 The Aim and Objectives of the Study

The aim is to investigate the perception of own risk of sexual HIV transmission and level of knowledge amongst health care workers in a health district in Botswana in order to streamline prevention messages for health care workers. Providing direction on guidelines to HIV prevention strategies and messages tailored for it at the workplace for healthcare workers.

Objectives:

- To establish the level of knowledge of HIV amongst healthcare workers in a health district in Botswana
- To assess the perception of own sexual risk of HIV infection amongst health care workers
- To evaluate the relationship between level of knowledge of HIV and perception of risk by healthcare workers.
- To provide direction on guidelines to HIV prevention strategies and messages tailored for HIV at the workplace for healthcare workers.

1.5 Research Question

What is the perception of own risk of sexual HIV transmission by healthcare workers in a health district in Botswana?

1.6 Method of Research

A cross-sectional survey was employed to collect data on the perspective of own sexual risk of health care workers in a health district in Botswana. The method was supported by focussing on a descriptive study which aimed to describe the perceptions of health care workers regarding their own sexual risk to HIV infection. A quantitative paradigm was chosen in this study in order to express the findings through the use of descriptive statistics.

1.7 Structure of the Study

Chapter 1 identifies the problem that will be addressed in this study and provides a rationale for the research. The aim and objectives of the study are outlined.

Chapter 2 provides a review of the relevant literature on the variables pertaining to the theoretical foundation of the study. The prevailing situation of HIV/AIDS and a focus on the health care workers is outlined. Research is limited by focusing on health care workers and their perceptions of HIV transmission; this gap is going to be explored to provide information that will pave the way forward in assisting and guiding these workers in the future.

Chapter 3 deals with the research method used in this study with specific reference to subjects, instruments and procedures of analysis.

Chapter 4 is devoted to the presentation of results and discussion of the analysed data. The aim is to answer the objectives posed in Chapter 1. A discussion and interpretation will follow of results in the light of previous research.

Chapter 5 will highlight the conclusions on the findings including recommendations to propose alternative approaches to ensure positive action and includes a brief on limitations of the study as well as areas for further research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The following outlines what has been established this far on HIV and health care workers. The literature review will identify gaps as well as review specific study designs for past research in this field. The purpose of a literature review is to convey current knowledge on the subject available (Burns & Grove, 2007). According to Polit and Beck (2006) literature review is also critical in order to:

- Identify a research problem and refine the research questions
- To know what is known and not known about the research topic and identify the gaps
- To identify new clinical interventions to be tested during research
- To help identify appropriate research designs and data collection methods for a study, and
- To get insights for interpretation of study findings and implications of the study

It is important to study the impact of HIV in the health delivery system of a country since health care workers are in the forefront of providing care to people living with HIV (PLWH). Health care workers are subject to similar risks of HIV infection as the general population by being subjected to the same social and economic pressures as the general population; they are exposed to HIV at the workplace and at the same time in their personal lives beyond the workplace (Shisana *et al*, 2004; Connelly *et al*, 2007). Providing care and guidance for the carers is humanly and economically important especially if it is to mitigate risk.

Prevalence of HIV in health care workers (HCWs) may just mirror the general population where this group reside. In South Africa a HIV prevalence study found a rate of 11.5% in

HCWs with the highest rate amongst student nurses (Connelly *et al*, 2007). During this period of the study the general population HIV prevalence was 15.8% in Gauteng province (Shisana *et al*, 2005). A recent study in Mozambique's Tete province revealed a HIV prevalence of 43.8% among health care workers being followed up in an Occupational Health Program (Casas *et al*, 2011). This HIV occurrence is particularly high but this was a referral program for health care workers who were mainly auxiliary staff and nurses.

In an editorial in the British Medical Journal, Ncayiyana (2004) laments that there is a significant proportion of doctors and nurses with HIV and AIDS in sub-Saharan Africa and this threat has not duly received the necessary attention. The health delivery systems especially in sub-Saharan Africa are threatened without receiving the necessary attention.

In Botswana about 17% of the health care workers succumbed due to HIV between 1999 and 2005 (WHO, 2006). Botswana's HIV related deaths in health care workers were lower compared to the region. The other countries in the region that is Zimbabwe, Mozambique, Malawi, Kenya and Ethiopia had 43% of deaths or medical retirement in health care workers as a result of suspected or known to be HIV related. Swaziland loses was about 3-4% of nurses annually as a result of HIV infection according to WHO (2006).

No known specific studies on HIV sexual risk perception have been done in Botswana health care workers but this is still a significant workplace issue given the national HIV prevalence of 17.6% reported in 2008 (BAIS III, 2009). This HIV prevalence in Botswana may equally represent the occurrence of HIV in health care workers when extracted from the communities where they reside. Zambia, South Africa and Malawi are some of the countries in sub-Saharan Africa with documented research in health care workers and perceptions on HIV risk (Kiragu *et al*, 2007; Connelly *et al*, 2007; Dieleman *et al*, 2007; Mbeba *et al*, 2011).

Research on HIV transmission in health care workers has mainly focussed on workplace exposure. Perceptions that have been assessed on healthcare workers would be those of risk of HIV transmission from occupational exposure as opposed to other settings. A

limited number of studies have been directed at risk of sexual HIV transmission in health care workers.

A study was conducted in Zambia that was related to the perceptions of healthcare workers. The title was self explanatory as represented by a quotation of what one of the healthcare worker said namely, 'we are also dying like any other people, we are also people'; perceptions of the impact of HIV/AIDS on health workers in two districts in Zambia (Dieleman *et al*, 2007). This report clearly shows that health care workers are equally affected by HIV even in their own personal capacities and prevention strategies should also address their needs. The statement expressed was lamented by a nurse as health care workers plead for support for HIV-positive health care workers. This statement clearly demonstrates there is clearly a gap in caring for careers of individuals and in these instance health care workers. This study by Dieleman *et al* (2007) was a qualitative study and complemented by a cross-sectional survey using a self-administered questionnaire. Triangulation was done with focus group discussions as well as in-depth interviews. In this study 76-79% of the healthcare workers feared HIV transmission at the workplace as opposed to in their own lifestyles. During focus group discussions in this study by Dieleman *et al* (2007) it was clear that HCW were losing their lives through HIV/AIDS but none were coming out in the open because of the fear of the stigma and potential discrimination developed by their communities.

When asked about perception of risk in health care workers, mostly people would think about occupational/professional risk which only accounts for about 0.33% through needle stick injuries as reported by Bartlett *et al* (2009). The main source of HIV transmission in sub-Saharan Africa is through unprotected heterosexual intersexual intercourse (including paid sex) and the onward transmission of HIV to newborns and breastfed babies (UNAIDS 2010). Health care workers fall within this category of the general population despite of their position to be privileged by having accessibility of health facts about HIV and AIDS; they are at times excluded in HIV prevention programming. Regarding the professional risk of acquiring HIV infection, perception was associated with everyday practice and was higher among healthcare workers who were exposed to patient's blood and other bodily

fluids (Jovic-Vranes *et al*, 2006). Experts published a paper in the Lancet in 2004 agreed that health care workers in southern Africa are at far greater risk for HIV infection through their personal risky sexual behaviours as opposed from occupational exposure (Schmid *et al*, 2004).

In most cases healthcare workers overestimate their perception of risk of occupational HIV transmission. Respondents (60%) in a study in India who thought the risk following needlestick injury was 100 percent and only 11% correctly identified the risk of 0.3% (Kermonde *et al*, 2005). This may imply that some health care workers will only have a perception of occupational risk of HIV infection as opposed to risk in their own lives such as sexual transmission.

A study conducted at an early stage of the epidemic concluded surveillance data seem to suggest that most health care workers with AIDS acquire the infection through a non-occupational route (Chamberland *et al*, 1991). This study was conducted during the early days of the epidemic and yet it was recognised by some researchers that non-occupational exposure in healthcare workers also makes a contribution.

There are a limited number of studies that have focused directly on the perception of sexual risk in health care workers; however, there are some that have documented sexual risk-taking in health care workers. One study from Zambia on sexual risk-taking and HIV testing among health care workers showed that a few health care workers had a perception of sexual risk; 33% had ever been tested for HIV and 37% had not used condoms during sexual encounter (Kiragu *et al*, 2007). In this study it was shown that females are less likely to trust or use condoms even in high-risk relationships. The method of eliciting responses from individuals included in the sample was through self administered questionnaires which were different for males and females in order to enable gender-appropriate phrasing of questions. This study by Kiragu *et al* (2007) did not use risk perception scales but inferred risk taking from the assessment of condom use, sexual activity and HIV testing. The research recommended the need to develop HIV and AIDS programmes for health care workers with the emphasis towards gender-based obstacles

hampering safer behaviours.

A similar study to the Zambian approach was conducted in Serbia investigating risk perception and attitudes towards HIV in health care workers (Jovic-Vranes *et al*, 2006). However, the emphasis by the researcher investigated the perception of professional risk from HIV as well as the knowledge, attitudes and practices. Jovic-Vranes *et al* (2006) used anonymous self-administered questionnaires with 36 questions after being pretested in 96 other health care workers.

In Rwanda a self administered questionnaire was used to assess knowledge, attitudes and practices about AIDS and condom utilization in health care workers (Rahlenbeck, 2004). In this study when respondents were asked about susceptibility to HIV, it was demonstrated that 48% of the health care workers did not feel vulnerable by indicating agreement with the statement: “People like me usually do not get the disease”; this demonstrated there was a low perception of risk in these health workers.

2.2 Perception of Risk

The perceptions and interpretation of risk by individuals are not accurate and is based on how familiar they are with the hazard (The Pennsylvania State University, 2004). Sjoberg (2000) discussed factors in risk perception by offering a different type of psychological explanation of the phenomena and its implications with it being measured as small or large or total absence to high levels. Risk denial is construed as an important feature of risk perception.

Perceived risk is even more important because it determines how individuals will act and have control over their situation. Weber *et al* (2002) presented a domain-specific risk-attitude scale measuring risk perceptions and related factors. These authors presented a psychometric scale that assesses risk taking in five different content domains namely: financial decisions, health/safety, recreational and social decisions. Weber *et al* (2002) describe attitude influences behaviour; attitudes are defined as the rational integration of

the expectancies and values responsible for the outcomes of the behaviour. Personal decisions can be based on familiarity and controllability and these affect risk perception and risk taking according to Weber *et al* (2002) and personal decisions apply to the different domains. In the health and safety setting these variables are applicable due to the human nature interacting with other individuals. The familiarity of HIV based on the exposure that HCW have on a daily basis should help them either make or with hold personal decisions on risk taking behaviour. Weber *et al* (2002) used a Likert scale to measure perception of risk together with binominal scales in their study.

A review of relevant literature pertaining to the subject will provide a basis to place perceived risk of health care workers in context and thereby make recommendations for the future.

2.3 HIV Knowledge

Many studies conducted with health care workers as subjects have focused on knowledge, attitude and practices (KAP) as opposed to including perceptions. A study was carried out in Malawi using peer group intervention to see if it reduces personal HIV risk for Malawian Health Workers. This research was based on the social-cognitive learning theory and they used group sessions as an intervention (Mbeba *et al*, 2011). A baseline level of knowledge was assessed using a six-item HIV knowledge index and health workers scored 84% correct; this demonstrates high knowledge levels. This study affirms the expected norm of health care workers of having high levels of knowledge pertaining to a common infection. These findings were published during the early stages of the epidemic and the level of knowledge at present will be expected to be higher and more detailed.

In another study carried out in Nigeria in 2005 on health care workers' knowledge on HIV and AIDS, researchers showed that more than 25% of this group thought the infection could be transmitted through saliva, vomit, faeces and urine (Aisien and Shobowale, 2005). Even though this study was done in the setting of risk of occupational exposure of HIV, it still demonstrated misconceptions in some health care workers a decade into this

epidemic.

A study conducted in India in 2005 assessing HIV-related knowledge, attitudes and risk the perception in health care workers showed a concern on the necessary knowledge regarding the diseases transmission (Kermode *et al*, 2005). A cross-sectional survey using anonymous self-administered written questionnaire was used in their study. Kermode *et al* (2005) assessed HIV knowledge using 12 statements regarding possible routes of HIV transmission and the average score was 9.5 (range 4-12, SD 1.71). The study showed health care workers were highly knowledgeable on how HIV is transmitted but their knowledge on how it is not transmitted was often incomplete. This may demonstrate myths and misconceptions in some health care workers which may lead them not having a perception of risk to HIV infection. The misconceptions were HIV transmission through saliva, urine, faeces, mosquitoes, coughing and sneezing and sharing of cups, plates and spoons. These responses were similar to those in Nigeria in the same year (Aisien and Shobowale, 2005). In this study by Kermode *et a* (2005) 63% of the HCW perceived their risk of occupational HIV infection was 'high'; researchers tested only occupational risk of HIV transmission.

Rahlenbeck (2004) did a KAP study about AIDS and condom utilization among health care workers in Rwanda and found moderate to good knowledge with an average of 63% of the questions being answered correctly. The poor responses were on AIDS symptoms which is concerning especially for health care workers. The question that may be posed is a level of knowledge at 63% protective in terms of risk taking behaviour acceptable?

It is obviously difficult to compare results on levels of knowledge regarding HIV and AIDS because researchers use different instruments to elicit responses from subjects. In a review of health care workers and HIV/AIDS, Horsman & Sheeran (1995) reviewed literature that showed there was a relationship between level of knowledge and education. They conclude in their literature review that levels of knowledge regarding HIV and AIDS are variable among healthcare workers mainly because of different measuring instruments used by researchers.

2.4 Sexual Practices and Condom Use

There are several factors that affect sexual practices such as marital status, number of sexual partners and the use of condoms. In the Rwandan study, 90.3% of the respondents reported being ever sexually active while 73.8% when sexually active defined by a sexual encounter one month prior to the interview while 22.8% acknowledged having multiple sexual partners (Rahlenbeck, 2004). It was reported in the study there was a low condom use represented by 16.8% in these health care workers. There was no association of condom use with age, gender, occupation, residency or religion but those with multiple sexual partners reported more use (31.4%) compared to 13.0% among those with one partner during the past year. Consistent and correct use of condoms is one of the cornerstones to HIV prevention. Specific knowledge about condom use is important if this behavioural pattern is going to be adopted by an individual.

Kiragu *et al* (2007) found many nurses do not believe that condoms are effective against HIV and so it was likely they will not use them and neither will they recommend them to others. It is not clear whether this translates into a lack of perception of risk in those who do not use condoms. Condom usage was reported to be 49% in the sexually active in the study by Keragu *et al* (2007). At the same time 9% of the respondents stated it was not necessary to use a condom. In the same study condom usage was very low in these health care workers with the sexually active reporting 2.9 times out of the last ten times they had sexual intercourse.

It is important to note the more frequent sexual encounters people are engaged in, the higher the chances of HIV transmission especially without protection. Sexual activity was reported in 60% of the respondents in the Zambian study with 26% having more than one sexual partner evenly distributed between men and women (Kiragu *et al*, 2007). This shows there is some degree of sexual activity hence it is important that prevention strategies are re-enforced in this group.

2.5 HIV Testing

HIV testing can be used as a marker to determine the degree of perception individuals have of the risk to be infected. If it is not because of fear, people would test for HIV based on their perception of risk of HIV infection. In a survey in health care workers in Kenya, a large percentage of workers stated they had not taken an HIV test just because they did not feel at risk. However, the opposite has been documented where occupational risk for HIV among health care workers in sub-Saharan Africa is prevalent (National AIDS and STD Control Programme, Kenya, 2006). There were 94% of health care workers in this survey in Kenya reporting being 'very concerned' about becoming HIV infected while at work. These health care workers perceived their risk to occupational exposure but did not express their perception of risk to sexual exposure on their own personal lives. The barrier to HIV testing that is well documented is those of refusal to acknowledge being at risk even amongst individuals who are at risk such as health care workers (Mavedzenge *et al*, 2011).

HIV testing has always been a challenge even in the general population and based on 10 population-based surveys conducted in 2007-2009; the median percentage of people living with HIV who know their status is estimated at less than 40% (Mavedzenge *et al*, 2011).

HIV testing of individuals and knowing their status is an important entry criterion to HIV prevention. There is a difference in behaviour between people who know their HIV status and those who do not and also the ones who are positive and who are negative. In a meta-analysis of high-risk sexual behaviour in persons aware and unaware they are infected with HIV in the United States of America found that the prevalence of high-risk sexual behaviour is reduced substantially after people become aware they are positive (Marks *et al*, 2005). In this meta-analysis the prevalence of unprotected anal or vaginal intercourse with any partner was an average of 53% lower in HIV positive persons aware of their status compared to the positive persons unaware of their status. This data means that perceptions on HIV testing may actually influence decision making on risk taking behaviour.

One of the methods of increasing HIV testing is through self-testing at home (Kachroo, 2006). There are pros and cons and health care workers have been accessing this form of HIV testing. Self-testing has not been addressed in the UNAIDS/WHO documents on HIV testing and counselling but countries such as Kenya has been implementing this approach since 2009 (Mavedzenge *et al*, 2011).

Some studies have demonstrated that health care workers are already self-testing for HIV for fear of stigma and discrimination and also due to familiarity with other providers who are doing the testing (Namakhoma, *et al* 2010; Corbett, 2007). This study used mixed methods (in-depth interviews and a questionnaire) to collect data on barriers to HIV counselling and testing in health care workers in Malawi and found that 22% reported self testing. The barriers to HIV testing found in Malawi included fear of a positive result, lack of confidentiality, personal acquaintance with those conducting the testing plus a perception of being 'role models' which could exacerbate their fears about confidentiality. In Mozambique 41% of the health care workers interviewed reported informal HIV self-testing (Corbett, 2007).

In a pilot program in Kenya to assess the feasibility and acceptability of HIV self testing among health care workers there was an overall uptake of 93.3% (Kalibala *et al*, 2010). Kalibala *et al* (2010) used triangulation with in-depth interviews and focus group discussions and found this method of HIV self testing to be acceptable among health care workers in Kenya. There are obviously draw backs to HIV self testing especially in the setting of a positive results. HIV self testing cuts the stage of preparing an individual for the test in the form of pre-test information or counselling. In the study in Mozambique, Corbett (2007) found there were a few health care workers who regretted self-testing because they felt they were unprepared to cope with results. Acceptability of self testing is high ranging between 72% and 80% among health care workers in Kenya, Ethiopia, Malawi, Mozambique and Zimbabwe (Corbet *et al*, 2007; Kalibala *et al*, 2010).

Where there is perception of risk there are chances individuals will be available to get tested for HIV. Responding to questions on HIV testing, medical doctors (55%) were the

most likely to say they had taken the test followed by paramedics (33%) and then nurses at 31% (Kiragu *et al*, 2007). Seventy six percent of the respondents in this study did not know their partner's HIV status. The main reason for not testing was expressed by the subjects that they 'do not feel at risk'. The HIV testing rate in a Serbian study showed that only 35% health care workers had ever taken an HIV test (Jovic-Vranes *et al*, 2006). Kiragu *et al* (2007) showed despite the risk-taking by health care workers, the majority of them engaging in such behaviour neither use condoms and nor did they plan to use them nor have they ever been tested for HIV.

2.6 HIV Disclosure

HIV disclosure is another challenge to be considered as it can influence perception of risk. HIV disclosure will be at multiple levels and is more important at the point of the partner. Does the health care worker know the HIV status of their partner and visa versa? When there is no perception of risk, health care workers will highly likely not request the status of their partners. Yet in the setting of occupational exposure, the status of the index patient is always sort and assumed to be positive if unknown and necessary precautions taken (Bartlett *et al*, 2009). Corbett *et al* (2007) found that 85% of those health care workers who had self-tested had disclosed their result to at least one person while many were not aware of the HIV status of their partner.

In Zambia 76% of health care workers in a study on sexual risk-taking reported they did not know the partner's HIV status (Kiragu, 2007). In this study medical doctors (44%) were by far the most likely to report knowledge of their sex partners being tested was lower in paramedics (25%), nurses (23%) and clinical officers (17%). It is clear from these figures the specific profession is not protective, only 44% of medical doctors knew the status of their sex partners. The question is whether these health care workers took some other form of assessments or assumptions on the status of their partners or they just did not perceive they could be at risk of HIV infection.

There was high disclosure reported in Malawi represented by 90% to someone especially a

spouse/partner (68%) or a friend (46%) (Mokhoma *et al.* 2010). The reasons for testing in this study were included possible occupational exposure (22%) and 'just wanted to know' in 49%; wanting to know HIV status may indirectly indicate a perception of risk.

2.7 Recommendations

Kiragu *et al.* (2007) in their report suggested that 'health care workers too, need to be actively reached with information and education services for HIV and AIDS as primary and targeted beneficiaries'. Just like any workplace program the healthcare worker should be targeted as well to ensure behaviour change even beyond the workplace. This will help healthcare workers to take better care of them in regard to HIV prevention. Horseman and Sheeran (1995) also targeted the attitudes of healthcare workers towards injection drug users or homosexuals which lead to stigmatisation. These are areas of concerns which need to be addressed as they may impact on perceptions of individuals.

A peer education intervention has been piloted in Zambia (Kiragu *et al.* 2005) where this intervention involved 70 peer educators who were using an audience based manual. This peer education intervention improved HIV testing as well as reducing risk taking behaviour and promoting condom use.

One strategy that has potential to have health care workers determines their HIV status is through a self testing kit (Mavedzenge *et al.*, 2011; Corbett, 2007; Namakhoma *et al.*, 2010). There are barriers to HIV testing as far as the current system is concerned and having health care workers accessing the test at home could improve that. Once HIV status is known, that could influence behaviour change as well as perception of risk.

2.8 Conclusion

Research conducted in the field of health care workers is mainly based on topics such as knowledge, attitudes and practices related to HIV and AIDS. A few researchers have looked at perceptions of sexual risk in health care workers as opposed to occupational

exposure. A need has been determined to explore this theme of the perception of risk in health care workers in Botswana. The literature review showed that both quantitative and qualitative paradigms can be used on the subject of perceptions of risk. A detailed review of the methodology to be followed will be placed in a quantitative context to provide substance to the envisaged study.

CHAPTER 3

METHODOLOGY

3.1 Introduction

Conducting research in a particular field has as its main aim to solve problems by utilising different methods and procedures to produce results. This study adopted a quantitative research approach through the use of questionnaires to elicit responses from selected subjects. Data was collected from doctors, nurses, pharmacy technicians, laboratory technician as well as health auxiliaries and counsellors using a self-administered anonymous questionnaire. The quantitative data was analysed using the statistical package for social sciences (SPSS) and presented in a meaningful manner to assist with the interpretation and ultimately making recommendations.

3.2 Research Design

A research design lays down the blueprint of how the study was conducted in order to maximize control over factors that could interfere with the validity of findings (Burns and Grove, 2005; de Vos, 2007; Christensen *et al.* 2011). This study employed a cross-sectional survey which was used to collect data on the perspectives of own sexual risk of health care workers in a health district in Botswana.

The paradigm chosen was quantitative-descriptive which allowed the data to be analysed and illustrated by visual representation aimed to describe the perceptions of health care workers regarding their own sexual risk to HIV infection. A quantitative-descriptive paradigm was chosen in this study because of the nature requiring questionnaires as a data collection method and allows for descriptive statistics as well as inferences (de Vos, 2007).

3.3 Research Method

A research method gives the logical process to be followed during the application of scientific methods and techniques when a particular phenomenon is investigated (Polit & Beck 2006:15).

The population from which the sample was drawn was defined as well as the sampling process thereby providing a foundation for the analysis of data generated by responses from the participants.

3.3.1 Population

Sampling refers to the process of drawing elements from a population in order to obtain a sample (Christensen, *et al*, 2011:150). A population encompasses the entire aggregate of cases that the researcher has an interest (Burns & Grove 2007:549). The population can be the targeted or accessible population depending on how easy it is for the researcher to access. Target population refers to the entire population of interest and it is the same population that the study results can be generalized (Polit & Beck, 2006:511, Burns & Grove, 2007:549). Accessible population is the group of people who are available for a particular study (Polit & Beck, 2006:495). The target population for this research was all health care workers in Botswana while the accessible population was the health care workers in Mabutsane health district.

3.3.2 Research setting

A study setting is the physical location and conditions in which data collection takes place (Polit & Beck, 2006:510). The study was conducted in a health district in Botswana called Mabutsane that originally consisted of 13 health facilities with a total of 65 health care workers. By the time the data collection was done, the district had been downsized to 9 facilities and 40 health care workers because there were 4 facilities which were a long distance from the district headquarters. These 4 outlying facilities were no longer falling within the jurisdiction of the health district. The health care workers included doctors,

nurses, counsellors, auxiliary nurses, pharmacy technicians and laboratory technicians.

3.3.3 Sample and sampling techniques

A sample is a subset of the population or a set of cases selected from the population for a study (Christensen *et al.* 2011). A sample is drawn for research purposes because it is not possible to study the entire population; sample is studied in order to understand the population from which it is drawn. The sample selected in this study was the entire population of health care workers in the health district because the population was small and only consisted of 40 health care workers.

3.3.4 Ethical issues related to sampling

Justice relates to the equitable distribution of benefits and burdens of research. In this study, participants were selected irrespective of gender, profession or social status and fair and equal treatment was accorded to all participants because all available health workers were included in the study.

3.4 Data Collection

Burns and Grove (2007) define data collection as a precise and systematic gathering of information relevant to specific research objectives or questions. Christensen *et al* (2011) stipulates that a researcher should adhere as closely as possible to the data collection procedure as planned. The main data source for this study was the completed questionnaires by the health care workers.

3.5 Development and Testing of Questionnaires

Self-administered anonymous questionnaires were used to collect data on perceptions from health care workers. The questionnaires were developed after an extensive literature search to ensure that all areas of perception are covered. The main studies that influenced

questionnaire development were Kiragu *et al* (2007); Namakhoma *et al* (2010); Dieleman *et al* (2007); Jovic-Vranes *et al* (2007); Kermonde *et al* (2005); and The “Voice” of the HIV infected and affected school age children in Botswana (2011). Benchmarking was done with similar researches to ensure the questions asked were valid to answer the proposed research question. The following were the main themes in the questionnaire where 30 questions were formulated:

- Socio-demographic data
- Knowledge of HIV and AIDS. The rating scale for knowledge was adopted from a study done in Botswana (The ‘Voice’ of the HIV infected children in Botswana, 2011). HIV transmission, prevention and ART knowledge were tested.
- Attitude and perceptions about HIV and AIDS.
- Sexual behaviour. The focus was on sexual encounters and condom use. A closed ended question was asked on whether there was a perception of risk or not concerning the topic.
- HIV testing.

The questionnaire was pilot-tested with 5 health care workers in a separate health district which was not part of the study to ensure that the format and structure of questions were suitable for the subjects chosen and any errors were corrected before going into the field. The main finding from the pilot was the structural layout of the questions which was criticised and this was corrected. The questionnaire took between 20 to 30 minutes to complete.

3.6 Data Collection Process

The questionnaire was administered in Mabutsane health district in Botswana between 1 November and 14 December 2011 to 40 health care workers; the sample included doctors, nurses, counsellors and nurse auxiliaries. The questionnaires were distributed from the District Health Management Team (DHMT) team which is headed by a Matron and a Senior Medical Officer (SMO). The questionnaires were distributed over a period of 2

weeks as representatives of facilities visit the DHMT offices often to collect supplies or were attending meetings. The participant information leaflet was used to introduce the study and a consent form was signed before the questionnaire was issued. Completed questionnaires were sent back to the DHMT offices where they were collected.

3.7 Reliability and Validity

Validity refers to the correctness of an inference that is made from results of a research which can be internal, external, construct or statistical conclusion (Christensen, *et al*, 2011). Validity in this study was enhanced by maintaining scientific integrity from proposal development to the conduct of the study. An extensive literature review was conducted and the questionnaires used were piloted prior to use at a separate site. Ensuring there were no confounders, the questionnaires were self administered and anonymous so that the participants felt free to express themselves. Confidentiality was maintained by ensuring there were no identifiers on the questionnaires.

Attrition was a threat to the validity of this study and therefore ample time was given to ensure that all facilities had collected their questionnaires and there was enough time for completion and for returning to a central point. Facilities that did not return the same numbers of questionnaires issued were followed up to ensure that at least all questionnaires were accounted for whether completed or not. Facilities were not forced to return questionnaires but were encouraged to bring back even those that were blank. Selection of subjects did not affect this study since all health care workers in the district were eligible to participate in the study.

3.8 Definition of Key Terms, Concepts and Variables

Perception: It is the process of becoming aware of something. It is defined in the free dictionary online (from <http://www.thefreedictionary.com>) as insight, intuition or knowledge gained by perceiving. In this study the perceptions of health care workers were defined as the action resulting from knowledge gained. When health care workers have some knowledge about HIV transmission and prevention, how will they translate that

knowledge into their own lives?

Own Sexual HIV infection risk: It is the risk of HIV infection by individuals through their personal act or behaviour. In this study health care workers were examined for their own risk of sexual HIV infection in their own personal lives beyond their profession.

Health care workers: These include any worker in health departments and can range from doctors through to nurses to ambulance drivers. In their study, Dieleman *et al* (2007) in Zambia, health care workers included were hospital managers, doctors, nurses and AIDS counsellors. In this study the following cadres were included as health care workers: doctors, matron, nurses, counsellors, auxiliary nurses, pharmacy technician and laboratory technicians.

3.9 Data Analysis and Interpretation

The purpose of data analysis is to organize, provide structure to and elicit meaning from the data (Polit and Beck, 2006). Descriptive statistics were used to describe the demographic situation and frequencies were also calculated for some variables.

Cross-tabulations were used to test if there were any significant differences by healthcare worker cadre of acquiring HIV infection.

3.10 Ethical Considerations

This study was approved by the University of Stellenbosch Ethics Committee (see appendix 5), The Human Research and Development Division (HRDD) in the Ministry of Health of Botswana (see appendix 6) as well as the District Health Management Team of Mabutsane health District (see appendix 4).

3.10.1 Confidentiality

The researcher who is trained in good clinical practice (GCP) collected data using an anonymous questionnaire and no identifiers were used which have a risk of linking the

respondent. The consent form was signed and kept separately from the questionnaires. Some participants chose to use anonymous names on the consent forms and this was acceptable. The anonymous questionnaires were collected separately with the consent forms to ensure that there was no linkage to the questionnaire.

3.10.2 Informed consent

An informed consent involves fully informing the research participants about all aspects of the study (Christensen *et al*, 2011). All participants in this study participated willingly and could withdraw at any time or chose not to complete the questionnaire. An informed consent form was signed after reading the participant information leaflet and if there were questions, these were addressed by the researcher. No coercion was used and participants were not paid for participating in the study. The research nurse who is fluent in the local language was available if needed for challenges with the local language for some other health cadres. All the health care workers who participated in this study were professionals fluent in English so there was no language barrier experienced during the study. The informed consent documents were collected and kept separately from the questionnaire to ensure there is no link with the anonymous questionnaire.

3.10.3 Data protection

The questionnaires and consent forms completed were stored in a locked cabinet and will be kept for at least 1 year after the completion of the study. The data collected through the questionnaires was entered into a Microsoft excel spreadsheet which was used to enter onto SPSS the software used for data analysis. This data is kept in a password protected laptop accessible by the researcher.

3.10.4 Provision of debriefing, counselling and additional information

The researcher and the research nurse were available after the completion of questionnaires to give room for participants that may want further information or clarity on the research contents.

3.10.5 Non-maleficence

The principle of non-maleficence refers to the researcher's duty to avoid, prevent or minimize harm to study participants (Polit and Beck, 2006:87). This study involved minimal risk and potential emotional discomfort during completion of questionnaires was explained before entry into the study. The researcher and the study nurse were available after completion of questionnaires if there were any questions or concerns.

3.10.6 Beneficence

This is a fundamental ethical principle that seeks to prevent harm and exploitation and at the same time maximizing benefits for study participants (Polit and Beck, 2006:496). This was a minimal risk study and there were no direct benefits to study participants. Potential benefit would be from the study's recommendations especially for interventions focused on health care workers to prevent HIV infection.

3.11 Conclusion

A blue print was provided of how the research in this report was conducted. This included the research paradigm followed, the data collection approach as well as the data analysis. Ethical considerations were elucidated for the data collection process. Chapter 4 provides the results and the discussion of the findings.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This was a cross-sectional survey investigating the perceptions of health care workers of self HIV infection. The following were the objectives of the study:

- To establish the level of knowledge of HIV amongst healthcare workers in a health district in Botswana
- To assess the perception of own sexual risk of HIV infection amongst health care workers
- To evaluate the relationship between level of knowledge of HIV and perception of risk by healthcare workers.
- To provide direction on guidelines to HIV prevention strategies and messages tailored for HIV at the workplace for healthcare workers.

The results of this study will be presented followed by a discussion of the findings based on current literature. The findings are arranged under the following headings: socio-demographics, knowledge of HIV, sexual behaviour, HIV testing and attitudes and risk perception of HIV among health care workers who participated in this study. A discussion of the results and comparison with current literature follows the presentation of the study results.

4.2 Socio-demographic Characteristics of Respondents

Forty questionnaires were distributed to all the health care facilities in the district of Mabutsane through a central point. A total of 32 health care workers completed the questionnaire representing a response rate of 80% which was acceptable. The socio-

demographic characteristics of the sample are represented in table 4.1. There were more female respondents (65.6%) compared to males (34.4%). The ages of the health care workers who participated in this study ranged from 22 to 64 years with a mean age of 34.5 years. There were respondents who were never married (59.4%) compared to those who were married at the time of completing the questionnaires.

Table 4.1: Socio-demographic characteristics

Variable		Frequency (n)	Percentage (%)
Age (years)	21-29	9	28.1
	30-39	15	46.9
	40-49	6	18.8
	50-59	1	3.3
	60+	1	3.3
Gender	Male	11	34.4
	Female	21	65.6
Marital status*	Never married	19	59.4
	Married	12	37.5
Professional cadre	Doctor	3	9.4
	Nurse	23	71.9
	Counsellor	4	12.5
	Auxiliary nurse	2	6.2
Length of service as health care professional (years)	<1	5	15.6
	1-2	2	6.2
	3-4	3	9.4
	>4	22	68.8
Training in HIV and AIDS programs?	Yes	29	90.6
	No	3	9.4

* 1 missing

Most of the respondents were nurses (71.9%) compared to doctors (9.4%), counsellors (12.5%) and nurse auxiliaries (6.2%). Most of these health care professionals had received some form of training (90.6%) in HIV through the government's training programs for health care workers. Sixty eight percent of the health care workers had been in service for at least 4 years and only 15.6% had been working as health care workers for less than one year.

4.3 Knowledge of HIV and AIDS

The level of knowledge was assessed at three levels: HIV transmission, HIV prevention and knowledge of antiretroviral therapy (ART). The overall knowledge was an average assessment of all the three levels.

4.3.1 Knowledge of HIV transmission

The participants in this study were asked to mention at least three ways in which HIV can be transmitted. The assessment of the level of knowledge was based on the following:

- Mentions at least three correct answers: Excellent knowledge
- Mentions two correct answers: Moderate knowledge
- Mentions one or no correct answer: Poor knowledge.

All the 32 participants in this study responded to this question and 29 (90.6%) demonstrated excellent knowledge regarding transmission of HIV. This is illustrated in the bar graph in figure 4.1.

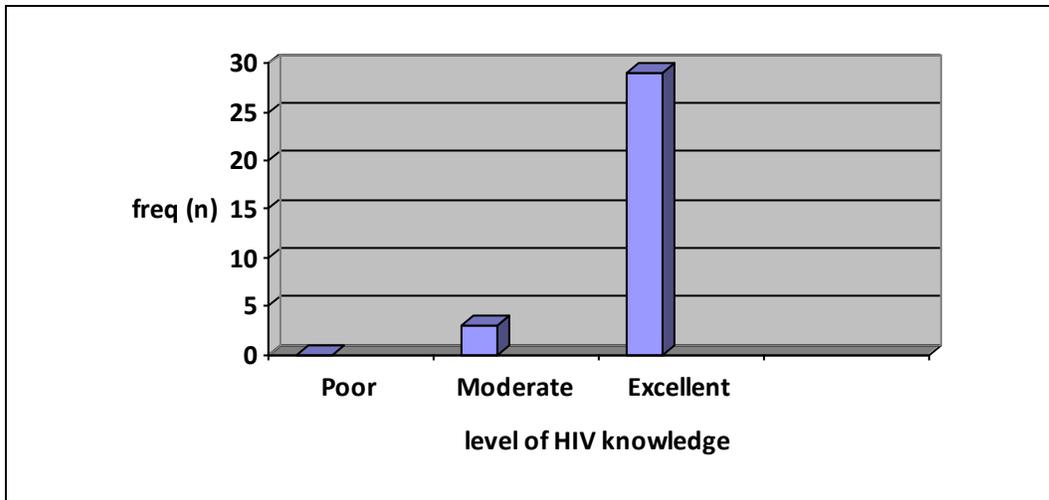


Figure 4.1: Knowledge of HIV transmission

Knowledge of transmission was also assessed through questions related to myths and conceptions of HIV transmission. The following questions were asked and required a true or false response:

- HIV can be transmitted through kissing?
- HIV can be transmitted through oral sex?
- HIV can be transmitted through mosquito bites?
- HIV cannot be transmitted through anal sex?
- Blood, semen, vaginal fluids, and breast milk are fluids that can transmit HIV?
- People who get HIV through needle sharing cannot spread the virus during sexual contact?

The level of misconceptions in these participants was low as evidenced by the high scores of correct answers given on these five questions. However, 28.1% of the participants thought that HIV cannot be transmitted through anal sex and 75% thought HIV can be transmitted through oral sex. This demonstrated some degree of misconceptions regarding anal and oral transmission of HIV.

4.3.2 Knowledge of HIV prevention

The knowledge of HIV prevention was assessed in a similar way to HIV transmission and an open-ended question asked the respondents to name at least three ways in which HIV can be prevented. There were 90.6% of the health care workers who correctly identified at least three ways of preventing HIV infection while 9.4% recognized two ways. This demonstrated excellent knowledge on HIV prevention methods in these participants (see figure 4.2).

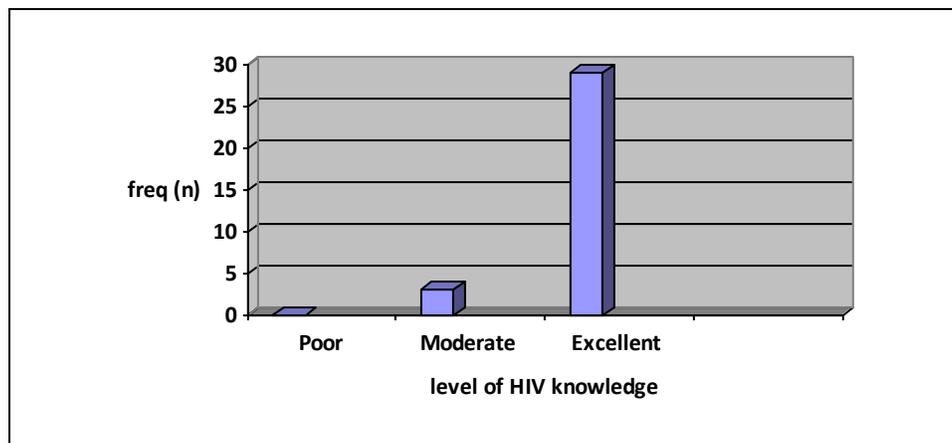


Figure 4.2 Knowledge of HIV prevention

Questions on myths and misconceptions were also asked to further assess the level of knowledge of HIV prevention. The following questions with a true/false response were asked:

- Keeping in good physical condition is the best way of preventing HIV infection?
- Most people with HIV will quickly show signs of being sick?
- A person must have a lot of sexual partners to be at risk for HIV?

The level of myths and misconceptions was also low for HIV prevention. There were 4 (12.5%) respondents who thought that a person must have many sexual partners to be at risk of HIV infection.

4.3.3 Knowledge of antiretroviral therapy

The level of knowledge was assessed of ART the participants to mention at least three things they knew about ART and the level was assessed the same way knowledge on HIV prevention and transmission. The level of knowledge of ART was moderate to high as represented in figure 4.3.

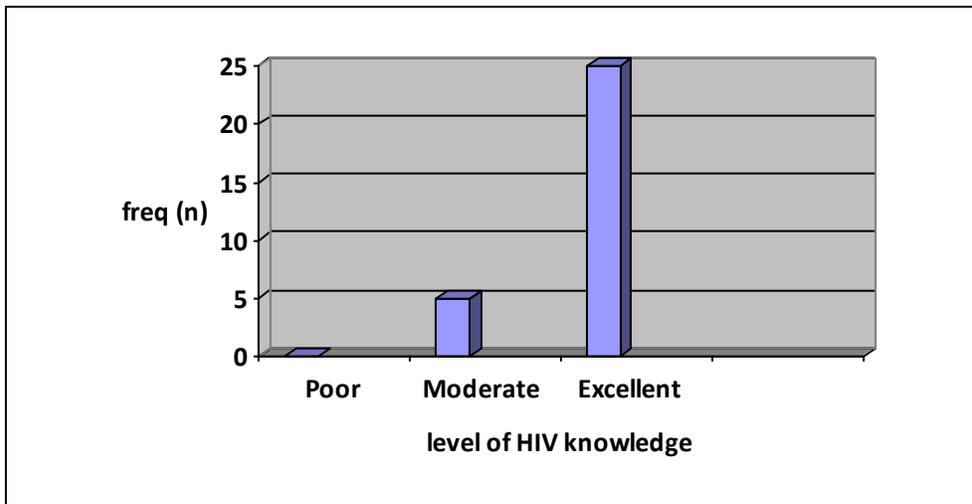


Figure 4.3: Level of ART knowledge

4.3.4 Average HIV knowledge

The average HIV knowledge of participants was assessed based on knowledge of HIV transmission, HIV prevention and ART. The knowledge in each level/category was scored according to:

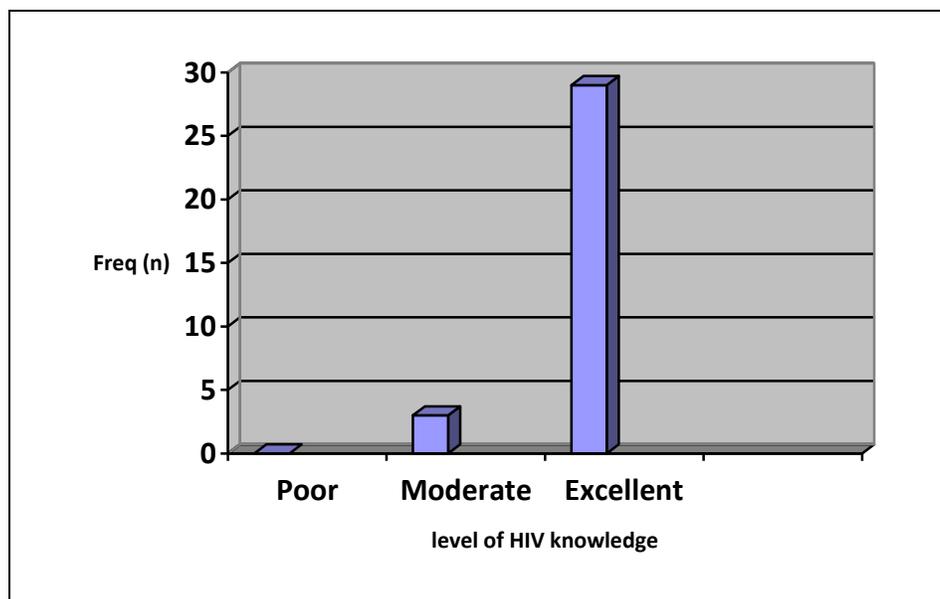
- Excellent = 3
- Moderate = 2
- Poor = 1

Table 4.2 below shows how the average knowledge was computed and assessed.

Table 4.2: Average knowledge formulae

Total score from each category	Average
7-9	Excellent
4-6	Moderate
1-3	Poor

The results of this study shows that the average HIV knowledge of health care workers in this health district in Botswana was moderate to excellent as shown in figure 4.4. There were 90.6% of the health care workers demonstrating overall excellent knowledge of HIV transmission, prevention and ART while 9.4% had moderate overall knowledge. All doctors and nurses demonstrated excellent knowledge while those demonstrating moderate knowledge were mainly nurse auxiliaries.

**Figure 4.4: Average HIV knowledge**

4.4 Sexual behaviour

The sexual behaviour amongst the participants was assessed based on safe sex practises including condom use. Table 4.5 shows the different questions that were asked in the questionnaire and the responses by the participants.

Table 4.5: Sexual behaviour responses

Question	Response [n, (freq, %)]	
	Agree	Disagree
Condoms for HCW are freely available?	26(81.2)	2(6.2)
HCW engage in extra marital sexual relations?	26(81.2)	5(15.6)
HCW have sex with fellow HCWs in exchange for favours?	11(34.4)	20(62.5)
HCW are reluctant are you to practice safe sex?	10(31.2)	19(59.4)
HCW practice the same prevention messages that they preach to their clients?	12(37.5)	20(62.5)

The majority (81.2%) agreed that condoms were freely available to health care workers. There were 10 (31.2%) of the respondents who thought health care workers were reluctant to practice safe sex while 12 (37.5%) thought health care workers practice the same prevention messages that they preach to their clients. Perceptions were that health care workers engage in extra marital sexual relations and 81.2% of the respondents agreed with this statement.

4.4.1 Number of sexual partners

The proportion of health care workers admitting to having more than one sexual partner was 15.6% (5 respondents) and only one participant admitted to having five or more sexual partners. This was in contrast to the perception that health care workers engaged in extra marital sexual relations admitted by 81.2% of the respondents in this study. However this could be taken in the context that only 37.5% of the health care workers were married. Twenty four of the twenty five participants who had one sexual partner displayed excellent

HIV knowledge while the one respondent who admitted to having five or more sexual partners also had excellent HIV knowledge.

The relationships to the sexual partners were spouse (34.4%), boyfriend/girlfriend (37.5%), fiancé (9.4%) and casual acquaintance (9.4%).

4.4.2 Condom use

Participants in this study were asked if they had used a condom during their last sexual encounter and 78.1% (25) admitted to using a condom while 7 (21.9%) did not use a condom. The following were reasons for condom use:

- To prevent HIV and other sexually transmitted infections (34.4%)
- To prevent HIV, other sexually transmitted infections and pregnancy (40.6%)
- Did not trust partner (3.1%).

There were 7 participants who did not use a condom during their last sexual encounter and 4 of them felt that they were not at risk of contracting HIV from their partner while one admitted to not using a condom because of the presence of a regular partner. Only one participant was not using a condom because they were trying to have a baby with their partner.

A cross-tabulation was done comparing average and condom use and showed that 24 of the 25 with excellent HIV knowledge actually used a condom in their last sexual encounter while 2 of those not using condom had moderate knowledge. This was not statistically significant.

In this study the participants were asked about their knowledge and perception of the most effective HIV prevention method for the health care worker and figure 4.5 shows a pie chart expressing the different perceptions.

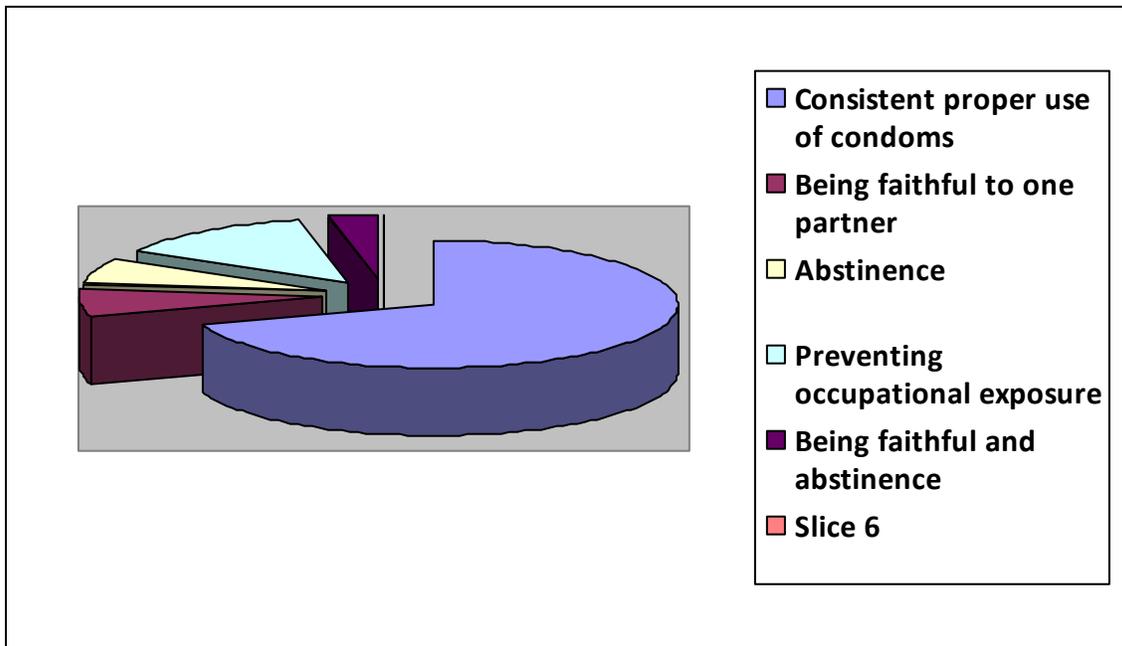


Figure 4.5: Most effective method of HIV prevention for the health care worker

Most participants (21, 65.6%) identified consistent and proper use of the condom as being also applicable to a health care worker in terms of the most effective HIV prevention method currently. There were 4 (12.5%) participants who felt that preventing occupational exposure was the most effective way of preventing HIV infection.

4.5 HIV testing

There were 30 (93.8%) health care workers who had ever tested for HIV while only 2 had never tested. The HIV testing rate was very high. There was no relationship between overall HIV knowledge and likelihood of testing for HIV as shown in table 4.6. While 27

of the 30 who had tested for HIV had excellent knowledge, all of those not tested for HIV also had excellent knowledge.

Table 1.6: Comparing average Knowledge and likelihood of HIV testing

		HIV testing		Total
		Yes	No	
		Average HIV knowledge	Moderate	
	Excellent	27	2	29
Total		30	2	32

All the participants who had not used condoms in the last sexual encounter had tested for HIV and there was no relationship between HIV testing and condom use in this cohort.

Most of the participants (27, 84.4%) in this study knew the HIV status of their partner while 28 (87.5%) admitted that their partners knew their HIV status. There were only 5 participants who had not shared their HIV status with their partner while 4 did not know the HIV status of their partner.

The participants were also asked about their opinions about how best to increase HIV testing among health workers many preferred routine checks at own facilities (46.9%) while others preferred self testing 3(3.1%), using a private doctor (12.5%) or having independent voluntary counselling and testing centres (12.5%).

An open ended question was asked about whether there is anything else that can be done to specifically prevent HIV infection in health care workers beyond the workplace and the following recommendations were made:

- Mandatory HIV testing for health care workers
- Organise wellness days
- Provide education and counselling facilities for health care workers
- Emphasize on behavioural change and counselling
- Same approach like the general population, nothing special
- Minimize the number of sexual partners
- Ensure health care workers with spouses are given an opportunity to be employed in the same vicinity

4.6 Attitudes and Risk Perception about HIV and AIDS

There were various questions which were asked in the questionnaire in order to assess the perceptions regarding risk of HIV amongst health care workers.

4.6.1 Perceptions about the at risk health professional cadre

Participants were asked about which health professional they thought is more likely to contract HIV through sexual contact. This was a closed ended questionnaire and responses included all cadres of health care workers and there was an option for all cadres. Table 4.3 shows the responses of the participants in this study.

Table 4.7: Perception of risk based on cadre of health care workers

Cadre of health care worker*	Freq(%)
Nurses	11(34.4)
All health cadres	9(28.1)
Doctors	6(18.8)

*6 missing

There were 34.4% of the participants who thought only nurses were more likely to contract

HIV through sexual contact, 18.8% thought only doctors were at risk while 28.1% thought that all health care cadres were at risk. This question tried to highlight risk of HIV transmission through sexual contact as opposed to the occupational risk of its transmission.

Participants were also asked why they thought that the different health care workers were at risk and 50% thought the risk of sexual transmission depended on the individual's personality. There were 6 (18.8%) of the respondents who thought the health care workers who were at risk of sexual HIV transmission were easily taken advantage of especially the lower cadres.

4.6.2 Perceptions on HIV status secrecy

The participants were also asked about their opinions about the following scenarios and were to agree or disagree with the statements:

- Health care workers should keep their HIV status a secret at work?
- HIV positive health care workers are a danger to their patients?

There were 14 (43.8%) of the participants who agreed health care workers should keep their HIV status a secret at work while 56.2% disagreed. A total of 71.9% did not think HIV positive health care workers are a danger to their patients while 28.1% agreed that those living with HIV and employed as health care professionals are a risk to their patients. These results are illustrated table 4.8.

Table 4.8: Perception of HIV secrecy

Question	Response [n, (freq, %)]	
	Agree	Disagree
Health care workers should keep their HIV status a secret at work?	14(43.8)	18(56.2)
HIV positive health care workers are a danger to their patients?	9(28.1)	23(71.9)

4.6.3 Perception of own risk of HIV infection

A closed ended question was also asked to assess perception of own risk of HIV infection. Participants were asked whether they felt they were at risk of HIV infection in their own individual capacity. A total of 78.1% (25) respondents thought they were at risk of HIV infection as opposed to 15.6% (5) who thought they were not at risk (see figure 4.5 below). The explanations given to the responses on this question mainly referred to individual's risk of occupational HIV exposure. Some respondents who felt they were not at risk mentioned they consistently use condoms and protect themselves in their work environments as well. One participant mentioned that because they are sexually active, they are always at risk of HIV infection and this was in agreement with those who thought that everyone was at risk irrespective of a profession.

A cross-tabulation of perception of risk against average knowledge revealed that almost all of the health care workers with excellent HIV knowledge were more likely to report a perception of risk of HIV infection. Cross-tabulation of perception of risk against gender, professional cadre, marital status, length of service, HIV training, number of sexual partners, condom use and HIV testing did not reveal any significant associations.

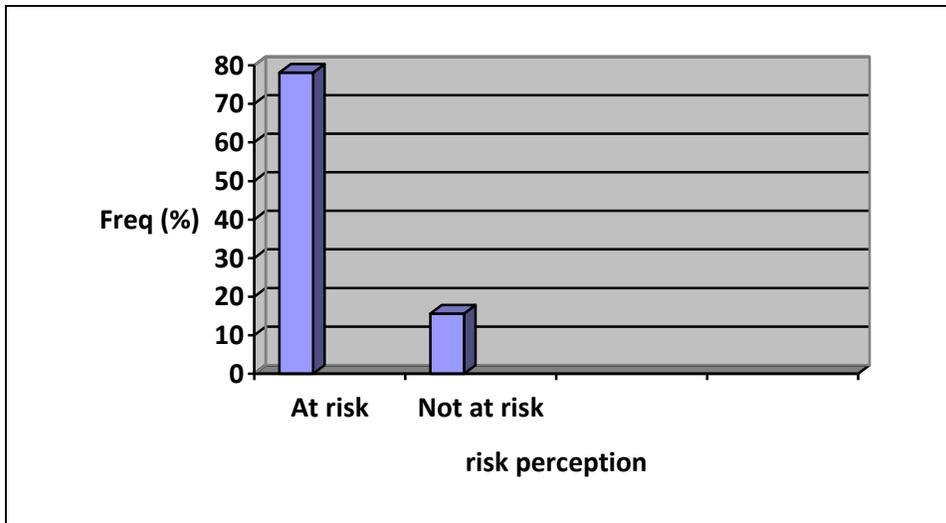


Figure 4.5: Perception of HIV risk

4.7 Discussion

The following is a discussion of the findings of this research as it relates to the objectives of the study as well as literature review.

4.7.1 Level of HIV knowledge amongst health care workers in Mabutsane district, Botswana

There were more females (65.6%) in this study than males (34.4%) with a mean age of 34.5 years and there were only 37.5% who were married. This is a different socio-demographic status compared to the study done in Zambia which had 57% males and the mean age was 34 years and 52.2% of the participants were married (Kiragu *et al.* 2007).

The majority of the health care workers who were involved in this study had some form of training in HIV and AIDS programs (90.6%) while 68.8% had been in the health care service for at least 4 years. Participants in the study from Zambia had been employed for a median of 5 years while Jovic-Vranes *et al.* (2006) had participants who had worked for

12.2 ± 9.2 years. The expectations would be high in terms of individual's knowledge of HIV and AIDS facts given this knowledge full background of training and long duration in service in the era of the HIV epidemic.

Knowledge in this study was based on assessment of what respondents knew about HIV transmission, prevention as well as ART. The health care workers in this study demonstrated moderate to excellent overall/average knowledge of HIV transmission, prevention as well as ART. There were no health care workers with poor knowledge in any of the categories. The result of this study was different to what Rahlenbeck (2004) found. Rahlenbeck demonstrated knowledge to be moderate to good among health care workers in Rwanda. The majority of the health care workers in this study in Rwanda were health auxiliaries and there were no nurses or doctors included and the method of assessment of knowledge was different.

There were 90.6% of the health care workers in this study demonstrating excellent knowledge regarding HIV transmission knowledge. There were low levels of misconceptions regarding HIV transmission but there were some significant results. 28.1% of the respondents thought that HIV cannot be transmitted through anal sex while 15.6% thought that HIV cannot be transmitted through oral sex. Other misconceptions that have been reported in other studies include HIV transmission through hugging, saliva, tears, sweat, stool and urine (Rahlenbeck, 2004; Jovic-Vranes *et al.* 2006).

Anal sexual encounters are high risk for HIV transmission while oral sex can be protective (Colfax *et al.* 2002; Rispel *et al.* 2011). In this study, there was a misconception amongst some respondents thinking that there is no risk of HIV transmission with anal sex and a significant risk with oral sex. Such misconceptions need to be cleared especially in health care workers who are supposed to be counselling patients to clarify such misconceptions and myths. The healthcare workers in this study were clear on correctly identifying the body fluids that can transmit HIV and the fact that even those who get HIV through needle sharing can still spread the virus through sexual contact.

The level of knowledge of HIV prevention was moderate to excellent but there were 12.5% of the health care workers who thought that a person must have many sexual partners in order to be at risk of HIV transmission. Reduction of number of sexual partners is a strategy for reducing HIV transmission but it does not take many sexual partners to be at risk of HIV infection (UNAIDS, 2010; Uchudi *et al.* 2011).

In summary the knowledge of HIV among health care workers in this health district in Botswana was moderate to excellent. There were some misconceptions regarding the risk of HIV transmission during anal and oral sex. While multiple sexual partners increase the risk of HIV infection, there are other factors involved even with just one partner when safe sex is not practised.

4.7.2 Sexual behaviour

There were 15.6% of the respondents in this study admitting to having more than one sexual partner. The percentage of health care workers with multiple sexual partners is lower than the 26% reported by Kiragu *et al.* (2007) in Zambia. The study by Kiragu *et al.* (2007) had 31% of medical doctors being most likely to report having multiple sexual partners and 25% being least likely. In this study perception questions were asked. More than 81.2% of the respondents thought that health care workers engaged in extramarital sexual relations irrespective of professional cadre. Health care workers are not any different from the general communities where they come from and this finding reveals there is still a high perception of multiple sexual partners which is counterproductive for the HIV epidemic response.

Having multiple concurrent partners is associated with high chances of HIV transmission and it demonstrates a low perception of risk especially when associated with low condom use (Grieb *et al.* 2011). Involvement with multiple sex partners is most prevalent in societies in which sexual norms are widely permissive and where polygamy is common and ideally this is not expected at high levels in health care professionals. Uchudi *et al.* (2011) reports men and women who are most likely to have multiple sex partners in the

sub-Saharan region are those who initiated sexual activity earlier and those who have the individual attributes such as young age, urban residence, education, media exposure and working for cash and away from home that bring to them more rights and/or decision-making autonomy, but not necessarily more financial resources and economic security and this applies mostly among women.

In terms of safe sex, the respondents in this study thought that in general health care workers are reluctant to practise safe sex (37.5%). There were 78.1% of the respondents reporting condom use in their last sexual contact and used condoms to prevent HIV, other sexually transmitted infections and pregnancy in 40.6% of the respondents. Kiragu *et al* (2007) found 58% believing that male condoms are effective in preventing HIV. Condom use in cohort of health care workers in Rwanda was reported low at 17% (Rahlenbeck, 2004). Nurses in multiple partnerships were the least likely to use condoms. A large number of health care workers in Zambia reported multiple sexual partners but low condom use indicating low perception of risk (Kiragu *et al*, 2007). Kiragu *et al* (2007) reported 60% with multiple partners were more likely to use a condom than monogamous (46%). It was also reported in that study reasons for not using condoms were: 35% trusted their partner, 30% used another method and 9% thought it was not necessary in monogamous males. In monogamous females, 35% trusted their partners, 21% used another method while 16% thought it was not necessary.

There were 65.6% of the respondents who correctly identified correct and consistent use of condoms as the most effective method of preventing HIV transmission. The Centre for Disease Control (CDC) has described the SAFE approach to HIV prevention. SAFE is an acronym for Serostatus Approach to Fighting the Epidemic (Janssen *et al*, 2001). The SAFE approach focuses on HIV positive individuals and the use of strategies to prevent transmission remain the cornerstone for prevention. Other components included in the SAFE approach are:

- Increase the number of HIV positive persons who know their serostatus.
- Increase the use of health care and preventive services

- Increase high-quality care and treatment
- Increase adherence to therapy by individuals with HIV
- Increase the number of individuals with HIV who adopt and sustain HIV–STD risk reduction behavior.

4.7.3 HIV testing

The HIV testing rate in this study of 93.8% was much higher than what was reported 33% in a similar study in Zambia (Kiragu *et al*, 2007). This study reports that medical doctors (55%) were more likely to have tested, 33% paramedics, 13% clinical officers and 31% nurses. In Malawi the testing uptake was 76% with 90% disclosing to their partner (Namakhoma *et al*, 2010). Routine HIV testing in Botswana has been in effect since 2004 and at the start HIV testing rate was only 48% in the general population (Weiser *et al*, 2006). This means that 7 years after the launch of routine HIV testing health care workers are also testing in high numbers. This may have implications on perception of risk from occupational exposure as well as own HIV risk in personal lives.

It was interesting to establish in this study that HIV disclosure to sexual partners was high but not the best. In this study 84.4% admitted to knowing the HIV status of their sexual partners while 87.5% reported that their partners knew their HIV status. The disclosure rate was lower than the 90% reported in Malawi by Namakhoma *et al* (2010). HIV disclosure is an important component of secondary HIV prevention especially in those living with HIV and leads to increased social support (Shacham *et al*, 2011). Being open about HIV serostatus may lead to couples more likely to practise safer sex and behaviour change.

Health care workers in this study reported easy access to HIV testing but reported that routine checks at own facilities could increase its testing among health care workers. In Malawi the health care workers tested in their own facilities with 55% of them as opposed to 45% who tested elsewhere. In this study it was found that 12.5% preferred using their own private doctor or any other independent voluntary counselling and testing centre. Only one respondent preferred self HIV testing. Eleven percent reported self HIV testing in

Malawi (Namakhoma *et al*, 2010).

HIV self testing was reported by Mavedzenge *et al* (2011) recognising that many health care workers are currently reluctant to seek HIV testing and therefore do not access treatment and prevention services. HIV self-testing enables accessibility, privacy, confidentiality and those who are positive can benefit from early diagnosis and treatment. Mavedzenge *et al* (2011) conclude that a well-implemented and regulated self-testing programme could be an effective way of maximizing HIV prevention and ensuring early entry into HIV care for health care workers, potentially at a lower cost and with fewer resource requirements than alternative approaches. Only 3.1% of the respondents in this study preferred self-HIV testing as a strategy for improving testing in Botswana for health care workers.

In summary the HIV testing rate for the respondents in this study was high with 93.8% admitting to knowing their HIV status. Disclosure of HIV status to a sexual partner is moderate at 87.5% and this could be improved. Access to HIV testing could be improved for health care workers in order to have accessibility, privacy and confidentiality.

4.7.4 Attitude and risk perception about HIV and AIDS

Perception of own risk of HIV transmission was the main subject of this study. Rahlenbeck (2004) reported only 48% of health care workers in their study did not feel susceptible by indicating agreement with the statement: “People like me usually do not get the disease”, however, 80% of the health care workers agreed that “even if people do everything to protect themselves, some will get the disease” (Rahlenbeck, 2004). In this study 78.1% of the respondents thought they were at risk of HIV infection. This was similar to the findings by Rahlenbeck (2004) where 80% of the health care workers in the study perceived risk of HIV infection even if there is protection.

The perception of risk is usually attributed to occupational risk in health care workers. The respondents in this study thought nurses were the most at risk to contract HIV (34.4%) but

50% responded that susceptibility to HIV depended on the individual's personality.

There is always a question of whether health care workers living with HIV should keep their status to themselves and not disclose it to their workplace. There were 56.2% who disagreed that health care workers living with HIV should keep it a secret at work. There are implications of HIV transmission to their patients especially those that may be involved in invasive procedures such as dentists and surgeons. This study revealed 71.9% of the respondents did not think that HIV positive health care workers are a danger to their patients.

4.1 Conclusion

This chapter presented the results and findings of the study. The level of knowledge was excellent amongst the health care workers in the health district in Botswana. There were 78.1% of the health care workers perceiving that they were at risk of HIV infection in their own personal lives related to sexual transmission. This is a fairly high perception of risk but for health care workers who are at risk in their own lives as well as through occupational exposure perception of risk could be higher. Those with perception of risk were more likely to have high HIV knowledge. There was no association of perception of HIV risk with gender, professional cadre, marital status and length of service, number of sexual partners, condom use and HIV testing.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

In conclusion the level of HIV knowledge amongst health care workers in a health district in Botswana was moderate to excellent. These health care workers demonstrated adequate knowledge related to modes of HIV transmission, strategies of preventing the infection as well as facts about antiretroviral therapy. High level of knowledge regarding HIV is meant to translate to positive behaviour change. The expectations are that health care workers would transmit the correct information to their clients as well as reflecting what they know in their lives. There were some misconceptions regarding the risk of HIV transmission during anal and oral sex. There were some respondents who thought that oral sex was not protective while not recognising the high risk associated with anal sex. While multiple sexual partners increase the risk of HIV infection, there are other factors involved even with just one partner when safe sex is not practised and this was a further misconception in this study. While the misconceptions were low it was however concerning that health care workers did not see the risk of anal sexual contact as opposed to oral sex.

There were 78.1% of health care workers in this study who perceived they were at risk of HIV infection either in their own personal lives or due to occupational exposure. The focus of this study was mainly on risk of HIV infection through own personal risk through sexual transmission. While this perception of risk is high, it could have been higher given that health care workers can be exposed to HIV occupationally as well as in their own personal lives. In their own lives health care workers live their lives just like any other person in their communities and so the risk may be the same compared to community members. Health care workers are more informed about their personal health and expectations would be that they take care of themselves better. This is the expectation which may not be reflected practically.

Safe sex was practised by a majority of health care workers especially those who perceived risk of HIV infection. Safe sex was displayed by having less multiple partners (only 15.6%), condom use (in 78.1%) and HIV testing (in 93.8%). These health care workers reported that condoms were freely available to them and the condom usage rate was comparable to the national average of 80% (Botswana AIDS Impact Survey, 2009). Multiple concurrent partners is a risk factor for HIV transmission and it was encouraging that this behaviour was not that common among the health care workers participating in this study.

There was also a high level of disclosure of HIV status to partner and vice versa. Most of the health care workers identified consistent and proper use of condoms as the most effective method of preventing HIV infection for health care workers which also applies to general population. Health care workers demonstrating a perception of HIV risk were more likely to have excellent knowledge of the infection and were more likely to practise safer sex. Disclosure of HIV status or a free discussion of sexual matters including HIV is very important for sexual partners. Being open to the discussion is important if condom use and issues of HIV are going to be discussed. It is encouraging that these health care workers had high levels of disclosure of HIV status to a sexual partner.

It was clear in this study that while health care workers are at an advantage and to have access to HIV information including reality cases there is still need to target them. While perception of risk is present it is not a hundred percent, health care workers are at risk in their workplaces as well as beyond the workplace. The risk of HIV infection is actually higher in their own personal lives than occupational exposure which is only 0.33% (Bartlett *et al*, 2009). The opinions passed by health care regarding HIV prevention amongst health care workers clearly demonstrated they should be approached just like the general population at risk. Health care workers in this study identified the need for behaviour change as well as accessing HIV testing as what should be emphasized in health care workers

5.2 Recommendations

HIV at the workplace is not only a concern for the industrial workplaces but the health care system should also be recognised and targeted. While the knowledge of HIV in this study is high there is a need to maintain the trainings offered as well as including a component of how health care workers can prevent HIV infection beyond occupational exposure.

Maintain the access to HIV testing and even consider other innovations such as self-HIV testing. Knowing the HIV individual status is an entry point for both treatment and prevention and can be used as a behaviour change strategy.

Health care workers in this study recommended the following as approaches to HIV infection in health care workers beyond the workplace:

- Same approach like the general population, nothing special
- Emphasize on behavioural change and counselling
- Provide education and counselling facilities for health care workers
- Minimize the number of sexual partners
- Mandatory HIV testing for health care workers
- Organise wellness days
- Ensure health care workers with spouses are given an opportunity to be employed in the same vicinity

5.3 Limitations of the research

This study was conducted in just one health district in Botswana which has a rural background. Even though the response rate was 80%, the sample size was small and no significant statistical tests of association could be done. A larger sample size and comparison with an urban setting could have been more helpful for this study. There is need to conduct a larger study considering aspects of the best prevention approaches for

health care workers with further analysis of the level of HIV knowledge.

This research utilized one data collection approach and richer data could be obtained by triangulation of data collection methods or even triangulation the research methodologies such as utilizing a qualitative approach as well.

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APPENDIX 1: Questionnaire

Socio-Demographics

101	What is your age? (years on your last birthday)	___
102	What is your gender?	1. Male 2. Female
103	What is your marital status?	1. Never married 2. Married 3. Separated 4. Divorced 5. Widowed
104	What is your job title?	1. Doctor 2. Matron 3. Nurse 4. Counselor 5. Auxiliary nurse 6. Pharmacy technician 7. Laboratory technician 8. Other (specify)___
105	How long have you been working as a health care worker?	1. <1 yr 2. 1-2 years 3. 3-4 years 4. >4 years
106	Have you ever had any training on HIV and AIDS programs?	1. Yes 2. No
107	If yes, please indicate all the trainings that you have ever undertaken.	_____ _____

Knowledge of HIV and AIDS

108	How is HIV transmitted? Please list at least 3.	1. _____ 2. _____
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		3. _____ 4. _____ 5. _____
109	Please indicate whether the following are true or false? Indicate by marking with “x”.	
	a) HIV can be transmitted through kissing?	T <input type="checkbox"/> F <input type="checkbox"/>
	b) HIV can be transmitted through oral sex?	T <input type="checkbox"/> F <input type="checkbox"/>
	c) HIV can be transmitted through mosquito bites?	T <input type="checkbox"/> F <input type="checkbox"/>
	d) HIV cannot be transmitted through anal sex?	T <input type="checkbox"/> F <input type="checkbox"/>
	e) Blood, semen, vaginal fluids, and breast milk are fluids that can transmit HIV?	T <input type="checkbox"/> F <input type="checkbox"/>
	f) People who get HIV through needle sharing cannot spread the virus during sexual contact?	T <input type="checkbox"/> F <input type="checkbox"/>
110	How is HIV prevented? Please list at least 3.	1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
111	Please indicate whether the following are true or false?	
	a) Keeping in good physical condition is the best way of preventing HIV infection?	T <input type="checkbox"/> F <input type="checkbox"/>
	b) Most people with HIV will quickly show signs of being	T <input type="checkbox"/> F <input type="checkbox"/>

	sick?	
	g) A person must have a lot of sexual partners to be at risk for HIV?	T <input type="checkbox"/> F <input type="checkbox"/>
112	What do you know about antiretroviral drugs (ART/ARVs)? Please list at least 3	1. _____ 2. _____ 3. _____

Attitudes and perception about HIV and AIDS

113	Which health professional do you think is more likely to contract HIV through sexual contact? (choose only one)	1. Doctors 2. Nurses 3. Counselors 4. Auxiliary nurses 5. Pharmacy technicians 6. Laboratory technicians 7. Other (specify)____
114	Why do you say so? (multiple responses allowed)	1. Most of them are not married- in a bid to find a partner. 2. To compensate low salary. 3. Lack of knowledge and understanding about HIV and AIDS 4. Easily taken advantage of, especially the lower cadre. 5. They have a lot of cash.

		6. It depends on individual's personality. 7. They have access to a private room. 8. Other (Specify)_____	
115	Do you agree or disagree with the following statements? Indicate by marking with "x".	Agree	Disagree
	a) Health care workers should keep their HIV status a secret at work?		
	b) HIV positive health care workers are a danger to their patients?		

Sexual behaviour

116	Do you agree or disagree with the following statements? ? Indicate by marking with "x".	Agree	Disagree
	a) Condoms for HCW are freely available?		
	b) HCW engage in extra marital sexual relations?		
	c) HCW have sex with fellow HCWs in exchange for favors?		
	d) HCW are reluctant to practice safe sex?		
	e) HCW practice the same prevention messages that they		

	preach to their clients?	
117	In the last 12 months, how many sexual partners have you had? If none skip to Q119	<ol style="list-style-type: none"> 1. One 2. Two 3. Three 4. Four 5. Five or more 6. None (Never had sex in the past 12 months)
118	What was the relationship with the partner(s) above? (Multiple responses allowed)	<ol style="list-style-type: none"> 1. Spouse 2. Girlfriend/boyfriend 3. Fiancé/Fiancée 4. Workmate 5. Sex worker 6. Casual acquaintance 7. Other (specify)
119	Did you use a condom the last time you had sex?	<ol style="list-style-type: none"> 1. Yes 2. No
220	If yes to Q119 why did you use a condom? (Multiple responses allowed)	<ol style="list-style-type: none"> 1. To prevent HIV and STIs 2. To prevent pregnancy 3. Did not trust partner 4. Partner requested or insisted 5. Other (specify)_____
221	If NO to Q119, why did you not use a condom? (Multiple responses allowed)	<ol style="list-style-type: none"> 1. You and your partner do not enjoy sex using a condom 2. You have no control in your relationship 3. You/your partner is trying to fall pregnant 4. You do not feel at risk of contracting HIV from your partner 5. Condoms were not available

		6. Did not anticipate having sex 7. Condoms are not effective 8. Do not use condoms with a regular partner 9. Other (specify)_____
222	Of the following methods, which do you feel is the most effective HIV prevention method for health care workers? <u>(Check one)</u>	1. Consistent proper use of condoms 2. Being faithful to one partner 3. Abstinence 4. Preventing occupational exposure 5. Use of post-exposure prophylaxis
223	As an individual, do you feel you are at risk of HIV infection?	1. Yes 2. No
224	Please explain your answer above	_____

HIV testing

225	Have you ever tested for HIV?	1. Yes 2. No
226	Please explain your answer above	
227	Does your partner know your HIV status?	1. Yes 2. No
228	Do you know your partner's HIV status	1. Yes 2. No

229	In your opinion, what would be the best way to increase HIV testing among HCW? Mark one	<ol style="list-style-type: none"> 1. Routine health check with HIV test each at your facility 2. Routine health check with HIV test at another facility 3. Going to a private doctor for routine health check with HIV test 4. Having independent VCT providers (e.g. Tebelopele) each year 5. Making self testing in private available for HCW 6. Special clinics for HCW 7. None of the above 8. Other (specify)
-----	---	---

230	Is there anything that can be done specifically for HCWs to prevent HIV infection beyond the workplace?	
-----	---	--

THANK YOU FOR COMPLETING THE QUESTIONNAIRE. PLEASE SEND YOUR COMPLETED QUESTIONNAIRE TO THE DHMT OFFICE THROUGH YOUR DRIVER.

APPENDIX 2: KNOWLEDGE ASSESSMENT CHECKLIST

TRANSMISSION:

1. Unprotected sexual intercourse with an infected partner
2. Mother to child transmission
3. Contact with infected blood e.g. blood transfusions, through cuts

Key: Mentions all = Excellent

Mentions 2 = Moderate

Mentions 1 = Poor

HIV PREVENTION:

1. Condom use
2. PMTCT
3. Abstinence
4. Avoiding contact with infected blood
5. Male circumcision
6. Behavior change e.g. reducing MCP

Key: Mentions all = Excellent

Mentions 3 = Moderate

Mentions 2 or 1 = Poor

ART

1. Drugs used to reduce the amount of the HIV in the body (makes the virus to sleep)
2. Lifelong treatment
3. Drugs taken same time every day
4. Drugs which are not supposed to be missed

Key: Mentions all = Excellent

Mentions 3 = Moderate

Mentions 1 or 2 = Poor

APPENDIX 3: LETTER OF REQUEST



AFRICA CENTRE FOR HIV/AIDS MANAGEMENT

06 June 2011

The Mabutsane sub-District Health Management Team
Mabutsane, Botswana

Dear Sir

RE: Intended Study pertaining to the perceptions of own sexual risk of HIV transmission by healthcare workers in a health district in Botswana

Dr. Tafireyi Marukutira, MPhil-student (Student Number: 16179072) at the Africa Centre for HIV/AIDS Management at Stellenbosch University, South Africa intends to conduct research to access the perceptions of own sexual risk of HIV transmission by healthcare workers in a health district in Botswana.

The target group will be health workers comprising doctors, nurses, Pharmacy technicians, Laboratory technicians, counselors and auxiliary staff from all the clinics and health posts falling under Mabutsane sub-District. The sample size will be all health care workers in the district. Eligible participants will be provided with an anonymous self-administered structured questionnaire which will ask about HIV knowledge, prevention as well as personal behavior towards HIV transmission and prevention. The questionnaire will take about 20 minutes to complete. The questionnaires will be distributed from the District Health Management Team (DHMT) office and will be sent back to the same office where Dr. Marukutira will collect for analysis.

The research is primarily academic but the results of this study will be made available to the District Health Management Team (DHMT) once the report is finalized. The research will be approved by the Stellenbosch Ethical Committee as well as the Ministry of Health, Botswana and documentation to that effect will be sent to you prior to data collection.

We therefore kindly request permission for Dr. Marukutira to carry out this study at the named facilities. The study should run between August 20 and September 30, 2011.

Feel free to contact us if you have any further questions.

Kind Regards

Burt Davis
Africa Centre for HIV/AIDS Management
Stellenbosch University
T: + 27 21 808 3006
F: + 27 21 808 3015
C: + 27 82 832 2828
E: burt@sun.ac.za



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UNIVERSITY OF SOUTH AFRICA

APPENDIX 4: AUTHORISATION LETTER

TELEPHONE: 5889286/5889057
FAX: 5889286



Republic of Botswana

DISTRICT HEALTH MANAGEMENT TEAM
MABUTSANE
BOTSWANA

Hert Davis,
Africa Centre for HIV/AIDS Management,
Stellenbosch University.

19th June, 2011

Dear Sir,

**RE: AUTHORISATION TO CARRY OUT STUDY ON PERCEPTION OF
OWN SEXUAL RISK OF HIV TRANSMISSION BY HEALTHCARE
WORKERS.**

This is to state that there is no objection in the conduction of this study in this health district of Botswana as long as due authorization by the Research body of the Ministry of Health of Botswana is obtained.

Following the approval from the Ministry of Health, assistance would be provided to make this study possible.

Thank you.

Yours Faithfully,
A handwritten signature in blue ink, appearing to read 'M. M. M. M. M.', is written over the stamp.
M. M. M. M. M.,
DISTRICT HEALTH TEAM
SENIOR MEDICAL OFFICER
2011-06-10
MABUTSANE
DISTRICT HEALTH TEAM



UNIVERSITEIT•STELLENBOSCH-UNIVERSITY
Jou kennisvennoot • your knowledge partner

Approval Notice New Application

24-Nov-2011
MARUKUTIRA, TAFIREYI TC

Protocol #: HS642/2011

Title: AN INVESTIGATION INTO THE ASSOCIATION BETWEEN PERCEPTIONS OF OWN SEXUAL RISK OF HIV TRANSMISSION AND KNOWLEDGE OF HIV BY HEALTHCARE WORKERS IN A HEALTH DISTRICT IN BOTSWANA

Dear DR. TAFIREYI MARUKUTIRA,

The New Application received on 26-Jul-2011, was reviewed by Research Ethics Committee: Human Research (Humanities) via Committee Review procedures on 28-Jul-2011 and has been approved.

Please note the following information about your approved research protocol:

Protocol Approval Period: 28-Jul-2011 -27-Jul-2012

Present Committee Members:

Van Wyk, Berte B
De Villiers, Mare MRH
Hattingh, Johannes JP
Theron, Carl CC
Sornhlaba, Ncobuzakhe NZ
Viviers, Suzette S
Bitar, Elias EM
Van Zyl, Gerhard Mkhonto

Standard provisions

1. The researcher will remain within the procedures and protocols indicated in the proposal, particularly in terms of any undertakings made in terms of the confidentiality of the information gathered.
2. The research will again be submitted for ethical clearance if there is any substantial departure from the existing proposal.
3. The researcher will remain within the parameters of any applicable national legislation, institutional guidelines and scientific standards relevant to the specific field of research.
4. The researcher will consider and implement the foregoing suggestions to lower the ethical risk associated with the research.

You may commence with your research with strict adherence to the abovementioned provisions and stipulations.

Please remember to use your protocol number (HS642/2011) on any documents or correspondence with the REC concerning your research protocol.

Please note that the REC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review:

Please note that a progress report should be submitted to the Committee before the approval period has expired if a continuation is required.

The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.

National Health Research Ethics Committee (NHREC) number REC-050411-032.

This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Provincial and City of Cape Town Approval

APPENDIX 6: ETHICS APPROVAL, MOH, BOTSWANA

**Telephone: (267) 363200
FAX (267) 353100
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD**



**MINISTRY OF HEALTH
PRIVATE BAG 0038
GABORONE**

REPUBLIC OF BOTSWANA

REFERENCE NO: PPME 13/18/1 PS V (207)

11 November 2011

Health Research and Development Division

Notification of IRB Review: New application

Tafireyi Marukutira
P.Bag BR 129
Gaborone

Protocol Title: AN INVESTIGATION INTO THE
ASSOCIATION BETWEEN PERCEPTIONS OF
OWN SEXUAL RISK OF HIV TRANSMISSION
AND KNOWLEDGE OF HIV BY HEALTHCARE
WORKERS IN A HEALTH DISTRICT IN
BOTSWANA

HRU Approval Date: 11 November 2011
HRU Expiration Date: 10 November 2012
HRU Review Type: HRU reviewed
HRU Review Determination: Approved
Risk Determination: Minimal risk

Dear MR Marukutira

Thank you for submitting new application for the above referenced protocol.

This approval includes the following:-

1. Application form
2. Protocol
3. Data collection tools

This permit does not however give you authority to collect data from the selected site without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Approval is for academic fulfillment only. Copies should also be submitted to all other relevant authorities.

If you have any questions please do not hesitate to contact Mr. P. Khulumani at pkhulumani@gov.bw, Tel +267-3914467 or Lemphi Moremi at lamoremi@gov.bw or Tel: +267-3632464

Continuing Review

In order to continue work on this study (including data analysis) beyond the expiry date, submit a Continuing Review Form for Approval at least three (3) months prior to the protocol's expiration date. The Continuing Review Form can be obtained from the Health Research Division Office (HRDD), Office No. 9A 11 or Ministry of Health website: www.moh.gov.bw or can be requested via e-mail from Mr. Kgomotso Motlhanka, e-mail address: kgmmotlhanka@gov.bw As a courtesy, the HRDD will send you a reminder email about eight (8) weeks before the lapse date, but failure to receive it does not affect your responsibility to submit a timely Continuing Report form

Amendments

During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek HRDC approval before implementing it. Please summarize the proposed change and the rationale for it in the amendment form available from the Health Research Division Office (HRDD), Office No. 9A 11 or Ministry of Health website: www.moh.gov.bw or can be requested via e-mail from Mr. Kgomotso Motlhanka, e-mail address: kmotlhanka@gov.bw . In addition submit three copies of an updated version of your original protocol application showing all proposed changes in bold or "track changes".

Reporting

Other events which must be reported promptly in writing to the HRDC include:

- Suspension or termination of the protocol by you or the grantor
- Unexpected problems involving risk to subjects or others
- Adverse events, including unanticipated or anticipated but severe physical harm to subjects.

Do not hesitate to contact us if you have any questions. Thank you for your cooperation and your commitment to the protection of human subjects in research.

Yours sincerely



P. Khulumani

For Permanent Secretary

APPENDIX 7: PARTICIPANT INFORMATION SHEET

Dear Respondent/Participant

Re: AN INVESTIGATION INTO THE ASSOCIATION BETWEEN PERCEPTIONS OF OWN SEXUAL RISK OF HIV TRANSMISSION AND KNOWLEDGE OF HIV BY HEALTHCARE WORKERS IN A HEALTH DISTRICT IN BOTSWANA

In partial fulfillments of the requirements of the Master Philosophy Degree in HIV/AIDS Management from the Africa Center of HIV/AIDS Management at Stellenbosch University. I am carrying out a study a study with the above title. The information you will supply is for academic purposes and will be treated with confidence. The purpose of this study is to investigate the perception of own risk of sexual HIV transmission and level of knowledge amongst health care workers in a health district in Botswana in order to streamline prevention messages for health care workers. To provide guidance on guidelines to HIV prevention strategies and messages tailored for HIV at the workplace for healthcare workers. Through the anonymous questionnaire I intend to gather your knowledge on HIV and AIDS well as your personal experiences and perceptions regarding HIV transmission and prevention.

By investigating the perceptions of health care workers regarding their own sexual risk to HIV transmission, it is hoped that the body of knowledge will be increased in this regard and prevention approaches can be revamped targeting HIV at the workplace of a healthcare worker. Prevention messages can then be developed that targets health care workers.

The study objectives are as follows-

- To assess the level of knowledge of HIV amongst healthcare workers in a health district in Botswana

- To assess the perception of own sexual risk of HIV infection amongst health care workers
- To analyze the relationship between level of knowledge of HIV and perception of risk by healthcare workers.

Please feel free to contact me should you have any questions or you need clarification.

Thank you.

Yours sincerely

TAFIREYI MARUKTIRA

APPENDIX 8: SETSWANA TRANSLATION OF PARTICIPANT INFORMATION SHEET

Go mo tsaya karolo.

Re: Patlisiso mo nyalanong magareng ga itemogelo ka bo diphatsa jwa kanamo ya mogare wa HIV ka badiri ba botsogo mo kgaolong ya botsogo mo Botswana.

Ke dira ditshekatsheko mabapi le setlhogo se se boletsweng fa godimo, e le karolo e e tlhoko mo dithutong tsame tsa Master of Philosophy Degree in HIV/AIDS Management le se Stellenbosch University.

Maduo a dipatlisiso tse a ya go dirisiwa go kwala pego e etletseng mabapi le tsa ithuto maduo a tla tshwarwa ka manontlhotlho a ko godimo.

Maikemisetso magolo a dipatlisiso tse ke go bona gore a nyalano magareng ga itemogelo diphatsa jwa kanamo ya mogare wa HIV ka badiri ba botsogo mo kgaolong ya botsogo mo Botswana e ntse jang.

Maduo a dipatlisiso tse a tlaa rethusa go tla ka mananeo a tla lemotshang badiri ba botsogo magareng ga itemogelo ka bo diphatsa jwa kanamo ya mogare wa HIV. Ditsholofelo kitso ka ipabalelo gore o seka wa tsenwa ke mogare mo tirong e tla oketsega ebile le mell hya ipabalelo e ka dirwa go itebagantswe le babereki ba botso.

Maikaelelo a dipatlisiso ke a a latelang:

- Go seka seka selekanyo sa kitso ya badiri ba botsogo ka mogare wa HIV mo kgaolong ya botsogo mo Botswana
- Go seka seka itemogelo ya badiri ba botsogo mo diphatseng tse bal eng mo go tlogela mogare wa HIV mo tirong.
- Go seka seka nyalano ya selekano sa kitso ya mogare wa HIV le itemogelo ya bo diphatsa jwa kanamo ya mogare wa HIV ka badiri ba botsogo bal eng mo go jone.

Ke tla kopa gore o gololesege go I kgolaganya lenna fa gona le tlhaloso e o ka e batlang mo diphatseng tse bal eng mo go tlogela mogare wa HIV mo tirong.

Ke a leboga.

Ka boikokobetso ke le

TAFIREYI MARUKTIRA

APPENDIX 9 - CONSENT TO PARTICIPATE IN RESEARCH

STELLENBOSCH UNIVERSITY CONSENT TO PARTICIPATE IN RESEARCH

AN INVESTIGATION INTO THE ASSOCIATION BETWEEN PERCEPTIONS OF OWN SEXUAL RISK OF HIV TRANSMISSION AND KNOWLEDGE OF HIV BY HEALTHCARE WORKERS IN A HEALTH DISTRICT IN BOTSWANA

You are asked to participate in a research study conducted by TAFIREYI MARUKUTIRA, a student from the Africa Centre for HIV and AIDS and the Management Sciences Faculty at University of Stellenbosch. The results of this research study will be compiled into a thesis report for academic purposes. You were selected as a possible participant in this study because you are employed as a healthcare worker in Mabutsane sub-District which is the target population of this research study.

1. PURPOSE OF THE STUDY

By investigating the perceptions of health care workers regarding their own sexual risk to HIV transmission, it is hoped that the body of knowledge will be increased in this regard and prevention approaches can be revamped targeting HIV at the workplace of a healthcare worker. Prevention messages can then be developed that targets health care workers.

2. PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following thing:

Sign a written informed consent which will be collected separately from you and will not be linked to your questionnaire.

After completion of the informed consent, you will be given a questionnaire which has 30 questionnaires for you to complete. This is an anonymous questionnaire. The questionnaire takes about 20-30 minutes to complete and will ask your age range, gender and various questions regarding HIV and AIDS transmission and prevention. You are not supposed to write your name on this questionnaire but you can take it home for completion and submit it to the office of the Senior Medical Officer at the District Health Management Team's office.

3. POTENTIAL RISKS AND DISCOMFORTS

There is no risk associated with this study. However discomfort may be encountered as you are asked some personal questions. However this is an anonymous questionnaire and the information entered will not be traced to you.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

There is no direct benefit of this research study to you as an individual. However, data that is generated from this research study will increase the body of knowledge on HIV prevention at the workplace and in this case, the healthcare worker. Policy makers may learn from this study for policy formulation regarding HIV prevention in healthcare workers.

5. PAYMENT FOR PARTICIPATION

You will not be paid to participate in this study

6. CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified

with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by the researcher and the assistant who are trained in good clinical practice (GCP) and will collect data using an anonymous questionnaire. No identifiers will be used which have a risk of linking you to your questionnaire. The anonymous questionnaires will be collected separately from the consent forms to ensure that there is no linkage to the questionnaire.

The research process may be inspected by the Ministry of Health of Botswana's Ethics Committee or the University of Stellenbosch Ethics Committee. The research report will be submitted to Ministry of Health, University of Stellenbosch as well as the District Health Management Team but none of the information can be traced to you.

7. PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact Tafireyi Marukutira at work on 3190083 or home 3161485 or cell 71625447 and email tcmarukutira@yahoo.com.

9. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 027 21 808 4622] at the Division for Research Development, University of Stellenbosch or Ministry of Health Botswana.....

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

The information above was described to me _____ (Research participant/subject) by _____ (Researcher/Assistant) in English and I am in command of this language. I was given the opportunity to ask questions and these questions were answered to my satisfaction.

I hereby consent voluntarily to participate in this study. I have been given a copy of this form.

Name of Subject/Participant

Name of Legal Representative (if applicable)

Signature of Subject/Participant or Legal Representative

Date

SIGNATURE OF INVESTIGATOR

I declare that I explained the information given in this document to _____ [*name of the subject/participant*] and/or [his/her] representative _____ [*name of the representative*]. [*He/she*] was encouraged and given ample time to ask me any questions. This conversation was conducted in *English* and *no translator was used*..

Signature of Investigator

Date

APPENDIX 10: SETSWANA TRANSLATION OF INFORMED CONSENT



UNIVERSITEIT•STELLENBOSCH•UNIVERSITY
jou kennisvennoot • your knowledge partner

**STELLENBOSCH UNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH**

**Patlisiso mo nyalanong magareng ga itemogelo ka bo
diphatsa jwa kanamo ya mogare wa HIV ka badiri ba
botsogo mo kgaolong ya botsogo mo Botswana.**

O kopiwa go tsaya karolo mo patlisisong ya dithuto e e dirwang ke Tafireyi Marukutira, moithuti wa go tswa Africa Centre for HIV and AIDS and the Management Sciences Faculty at University of Stellenbosch. Maduo a dipatlisiso tse a ya go dirisiwa go kwala pego e etletseng mabapi le tsa ithuto, mme maduo a tla tshwarwa ka manontlhotlho a ko godimo.

O thlophetswe go tsaya karolo mo patlisisong e ka mabaka a gore o o hirilwe o le mmereki wa tsa botsogo mo kgaolong ya mabutsane e e leng yone e ke itebagantseng le tone mo patlisisong e.

1. Mosola Wa Patlisiso e.

Ka go batlisisa Itemogelo ya babereki ba botsogo ka bodiphtsa jwa go tsenwa ke mogare wa HIV jo ba ka tswang ba le mo go jone, go solofelwa fa kitso ya bone ka mogare wa HIV e tla oketsega ebile go ka tsosoloswa mananeo a iphemelo mo go tsenweng ke mogare wa HIV a a tebagantseng le mmereki wa tsa botsogo ko tirong. Go ka rotloetsa gore melaetsa ya ipabalelo mo go tsenweng ke mogare wa HIV e dirwe mme e itebagantse le babereki ba botsogo mo tirong.

2. Tsamaiso

Fa o ka ithaopa go tsaya karolo mo patlisisong e, re tla kope gore o dire tse di latelang;

Saena fomo e go itseseng ka patlisiso e ebile e go tlhalosetsa ka yone, e e leng gore e tla tsewa mogo wena ga o feditse mme e ka se amangwe le pampiri ya dipotso e o tla e rabang.