



Exploring HIV risk compensation among men with medical male circumcision uptake and oral pre-exposure prophylaxis use. A comparative study in Umlazi and Vulindlela in KwaZulu-Natal.

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Declaration

To the best of my knowledge, I affirm that:

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27/01/2020

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Dedication

I dedicate this work to

My late mother, Samukelisiwe Rachel Khanyile, for always pushing me to be the best I can be even in moments I was ready to give up. For never giving up on me and making me know I am the best at all times.

My daughter, Milisuthando, your birth reignited a drive in me I thought I had lost a long time ago. Having you made me want to be a better woman, so that I can show you that as an African child you can do anything you set your mind to.

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Acronyms/Abbreviation

Abstinence, Be Faithful and Condomise (ABC)

Antiretroviral medications (ARVs)

Antiretroviral treatment/therapy (ART)

Behaviour Change Communication (BCC)

Centre for Disease Control (CDC)

Centre for the Aids Programme of Research in South Africa (CAPRISA)

Community Outreach Programme in Vulindlela (COMOSAT)

Drama in AIDS Education (DramAidE)

Emtricitabine (FTC)

Fifth South African National HIV Prevalence, Incidence, Behaviour and Communication Survey (SABSSM V)

Focus group discussion (FGD)

Health Belief Model (HBM)

HIV counselling and testing (HCT)

Human papillomavirus (HPV)

Human Sciences Research Council (HSRC)

Joint United Nations Programme on HIV/AIDS (UNAIDS)

Kwazulu-Natal (KZN)

Medical male circumcision (MMC)

Medicines Control Council (MCC)

Men who have Sex with Men (MSM)

Non-governmental organisations (NGOs)

People living with HIV (PLHIV)

People who inject drugs (PWID)

Pharmacy and Poisons Board (PPB)

pre-exposure prophylaxis (PrEP)

Pre-exposure Prophylaxis Initiative (iPrEx)

Prevention of mother-to-child transmission (PMTCT)

SA Health Monitoring Survey of Female Sex Workers (SAHMS-FSW)

Sex workers (SW)

Sexually transmitted infections (STIs)

Simian or simian/human immunodeficiency virus (SIV/SHIV)

Social and Behaviour Change Communication (SBCC)

Social Change Communication (SCC)

Social Ecology Model for Communication and Health Behaviour (SEMCHB)

Tenofovir disoproxil fumarate (TDF)

Test and Treat (T&T)

Treatment Action Campaign (TAC)

Ugandan AIDS Indicator Survey (UAIS)

United States of America (USA)

Universal Test-and-Treat (UTT)

Voluntary medical male circumcision (VMMC)

Vulindlela research site (VRS)

World Health Organization (WHO)

Abstract

There were approximately 38.0 million people globally, living with HIV at the end of 2019 and Sub-Saharan Africa accounts for a third of those living with HIV. New biomedical HIV prevention methods such as mother-to-child transmission (PMTCT), antiretroviral treatment (ART) and voluntary medical male circumcision (VMMC) have shown great promise. Oral PrEP has the potential to greatly aid in the reduction of HIV infection rates among men.

The study uses the concepts of the Health Belief Model (HBM), Social Ecology Model for Communication and Health Behaviour (SEMCHB), and the Risk Compensation Theory (RCT) to understand factors that influence the decision-making process of men when choosing biomedical HIV prevention options. These theories also enable an understanding of how individuals perceive risk, the benefits of safe behaviour, and how this is realized in their actions. In this qualitative study, four focus group discussions were conducted with African males ages 18 – 39 in Umlazi and Vulindlela, KwaZulu-Natal. Data was analysed using thematic analysis, applying the constructs of the HBM, SEMCHB and RCT to develop themes and sub-themes.

Key findings revealed that perception of risk and perceived susceptibility were low among the men. However, perceived severity was high. The researcher also observed a lack of knowledge of HIV acquisition, and lack of proper knowledge of biomedical HIV prevention methods, VMMC and PrEP.

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Chapter 1: Introduction

Introduction

This study sets out to investigate the concept of risk compensation among rural and peri-urban African males in the uptake of two biomedical HIV prevention interventions; voluntary medical male circumcision (VMMC) and pre-exposure prophylaxis (PrEP) and the factors that influence and contribute to the decision-making process on the uptake of these interventions in Umlazi and Vulindlela, South Africa.

This chapter highlights the global landscape of the HIV epidemic and contextualises the methods of HIV prevention in the past three decades. The study uses the Health Belief Model (HBM) to understand how interpersonal factors influence behaviour change and the Risk Compensation Theory (RCT). The HBM is embedded within the Social Ecology Model for Communication and Health Behaviour.

Purpose of the study

The purpose of the study is to understand the factors that influence the decision-making process of African men when choosing biomedical HIV prevention methods and risk compensation.

Study background

Globally there are approximately 38.0 million people living with HIV (PLWH) in 2019 and 20.7 million of people infected with HIV live within the sub-Saharan Africa region (UNAIDS, 2021). Globally, by the end of 2019, 32.7 million individuals were deceased due to AIDS-related ailments since the beginning of the epidemic, and sub-Saharan Africa accounts for 300 000 of those deaths (UNAIDS, 2021). These statistics show that HIV and AIDS remains a major cause for death in the region. There are various interventions and numerous awareness campaigns put in place by government and non-governmental organisations (NGOs) both locally and internationally but there are still new infections and deaths related to AIDS.

South Africa has the largest quantity of PLWH in the world (Avert, 2021). KwaZulu-Natal, out of the nine provinces in South Africa, has the highest recorded incidence of HIV (MacDonell and Low, 2019). Literature suggests that in South Africa, the most common way of HIV transmission is through heterosexual sex (Zuma, et al., 2016; Ndzinisa, 2017). The most effective means of HIV prevention are HIV counselling and testing (HCT) and consistent condom use. Therefore, health communication can aid in the uptake and acceptability of biomedical HIV prevention methods (Baxter and Abdool Karim, 2016; Dellar, et al., 2015).

Defining public health

Public health is a concept that is hard to pin down into one simple definition. Public health can be defined as “the science of protecting and improving the health of people and their communities” and it can also mean the measures people take as society to maintain and bring about improvement to their general state of health (Centers for Disease Control Foundation, 2017; Schneider and Schneider, 2016). Therefore, public health can be understood as a notion that largely involves population-based activities that try to protect people from harm, prevent disease and promote health (Maycock, 2015). The understanding of public health is relevant to this study because VMMC has been majorly delivered through the public health system, and once PrEP is readily and freely available it will be delivered through the public health system in South Africa.

Public health seeks to eliminate or suspend illness among people in society (Brownson, et al., 2017). Therefore, we can say that public health is interested in the optimal health of all people in the population (Chasi, 2014b). It is worth noting that even the concept of health is hard to define as it means different things to people. Someone suffering from a chronic illness may define health in terms of their ability to have a good standard of living despite the burden of disease in their life. Another may view health as the absence of disease altogether (Chasi, 2014b). Regardless of how people may perceive health, it is important that every individual in a society benefit from public health.

The purpose of public health is to engage in supportive practices that reproduce and produce conditions and experiences of well-being. It is important to locate HIV prevention in the public health approach (Brownson, et al., 2017; WHO, 2016). To ensure access to high-quality services at the population level, while achieving a balance between the best proven standard of care and feasibility on a large scale, especially in resource-constrained settings, such as South Africa, it is important to adopt a public health approach in HIV prevention strategies (Jones, et al., 2014). The health and safety of society depends greatly on a sturdy public health system. However, the critical role of timely, strategic, and effective communication in public health is often overlooked (Kaufman, et al., 2014). South Africa’s public health system is two-tiered, consisting of private and public health care. Private health care, for those who can afford it, provides first-rate care and attention, whilst the public sector is overwhelmed with challenges of lack of essential equipment, medical staff shortages and medicine shortages resulting in the provision of a poor standard of care (Crush and Tawodzera, 2014). Effective public health communication advises people of how and where to access healthcare services and how to use those services for their benefit. Therefore, it is important to find ways to

leverage on public health communication to ensure the general public is aware of new HIV prevention methods such as VMMC and oral PrEP and their benefits.

The case for public health communication

Defining public health is significant to understand public health communication and its importance in advancing biomedical HIV prevention methods, namely VMMC and oral PrEP. In order to define public health communication, we need to think about the notion of communication. There are different definitions of communication. Communication is the process of sending information to a receiver (Tomaselli and Chasi, 2011). Communication is also the effort to exchange meaning (Chasi, 2014a). This school of thought focuses on the notion of culture and the understanding that an individual endeavours to share meaning verbally within systems of meaning that are informed by their environment (Tomaselli and Chasi, 2011). Protecting the public and promoting health, involves both evidence-based science and effective public health communication (Eldredge, et al., 2016). Public health communication can be defined as the process of constructing, adapting, and disseminating messages about promoting health and preventing disease to society at large (Harvey and Koteyko, 2012). This study seeks to understand how the men in Umlazi and Vulindlela, South Africa perceive VMMC and oral PrEP. The study considers the ways in which the lived experiences and environment of men contribute to the formation of their perceptions about VMMC and oral PrEP as well as how these perceptions inform their acceptance or rejection of these biomedical HIV prevention methods. This can help inform future public health communication on uptake of VMMC and oral PrEP geared towards men.

The development of biomedical interventions such as VMMC and oral PrEP provides an opportunity to reduce the escalating HIV infection rate among key populations in South Africa. These key populations consist of people who depend on the public health sector for care. Thus, the need to ensure that availability of such interventions is communicated to key populations that require access to them (Jones, et al., 2014). Therefore, public health communication becomes the vehicle through which such information is shared. In this way, positive outcomes in the uptake and delivery of HIV prevention interventions such as oral PrEP, anti-retroviral therapy and VMMC can be achieved. Conversely, before one can apply the power of public health communication, we need to understand the evolution of health communication.

Paradigm shifts in health communication

HIV has been positioned as a health and a development problem (Govender, 2010; Wilkins, et al., 2014). Approaches to the prevention and control of the HIV/AIDS epidemic in sub-

Saharan Africa follow policies and early experiences from the developed countries, where the disease affects different key population groups (Wilkins, et al., 2014). Using these approaches leads to poor adherence and uptake of HIV prevention interventions resulting in minimal impact in reducing high HIV infection rates in the region (Auerbach, et al., 2011).

Behaviour Change Communication

There are two main schools of thought that arose in health communication during the transition with development (McQuail and Windahl, 2015). Firstly, Behaviour Change Communication (BCC) and Social Change Communication (SCC).

The urgency of the HIV pandemic requires a high focus on individual behaviour and the use of targeted messages to promote health and reduce risky behaviours which is the foundation of BCC (Koenker, et al., 2014). The promotion of positive health outcomes is based on recognised theories and models of behaviour change, such as the social cognitive theory (SCT) and health belief model. BCC has mostly been engaged in the promotion of biomedical interventions in HIV prevention (Bekalu, et al., 2017). Reports from researchers have been released about the efficacy of an HIV prevention method, such as anti-retroviral drugs, condoms, and medical male circumcision. Thereafter, such prevention methods are made available to the general public, usually through the public health sector. This is often accompanied by media campaigns about the benefits and reasons why people should accept them (Lalla-Edward, et al., 2016).

BCC approaches recognize that individuals have the capacity to choose to accept or reject a certain behaviour they tend to be limited by a series of abstract and contextual issues (Ndzinisa, 2017; Govender, 2011). If the case of VMMC and oral PrEP were taken as examples, applying strictly BCC approaches would not result in effective uptake of these biomedical intervention. While men may understand their vulnerability to HIV infection, they may not become circumcised or use oral PrEP due to contextual factors such as negative perceptions of the interventions, lack of sufficient knowledge about VMMC and oral PrEP and ease of accessing these interventions. Therefore, it is important to consider the environment in which the intended target of any health communication lives. Meaning, there is a need to develop communication strategies that consider social context and not only focus on BCC.

Social Change Communication

Changes in paradigms of development called for changes in the communication of HIV interventions in the era of BBC. Critics of BCC marked the disadvantages of the approach and moved towards a social change communication (SCC) approach (Chandwani and Gopal,

2010; Figueroa, et al., 2002). This was based on the argument that communication responses need to account for the environment in which the epidemic is rooted in (Obregon and Waisbord, 2012). Therefore, understanding the underlying factors of HIV transmission cannot be separated from a wider context of inequality, social exclusion, and poverty. Accordingly, SCC perceives people and communities as agents of their own change and stresses community empowerment which creates an environment of change that is orientated on the process and provides a voice for communities and for open dialogue (Govender, 2010); also accounting for the environment where the pandemic is entrenched.

It has been established over time that making HIV prevention interventions available does not translate to uptake (Logie, et al., 2017; Robinson, et al., 2017). This illustrates the necessity of exploring the underlying factors that could be enablers or barriers for the acceptance and uptake of VMMC and oral PrEP among men. This further elucidates how essential it is to have a more comprehensive combination approach to account for the factors that influence the uptake of HIV prevention methods.

Social and Behaviour Change Communication

Research indicates that the most effective approach to reducing HIV infections is a combination of prevention approach that combines biomedical, behavioural, and structural interventions that help reduce the vulnerability to HIV infection and fast tracks the uptake of vital prevention methods (Karim, et al., 2017; Isbell, et al., 2016). Hence the need for communication that considers the individual, the structural factors and context that influence HIV infection among men.

Social and Behaviour Change Communication (SBCC) is based on the idea that people's behaviours need to be understood and addressed within a context that comprises of social relations to policies and values and cultural norms that form the environment in which individuals reside in (Christofides, et al., 2013). Therefore, in order for interventions to make an impact at population level, SBCC strategies need to consider drawing from various disciplines such as communication, sociology, marketing and political science (Kaufman, et al., 2014). These disciplines together with health policy analysis, epidemiology and health economics combine to form the basis of SBCC (Christofides, et al., 2013).

Thus, the study adopts the perspective of SBCC. This allows for innovative HIV prevention methods such as VMMC and oral PrEP to be part of a comprehensive combination prevention approach key in achieving universal access to HIV prevention, care, treatment, and support for the key and general populations. Offering more than biomedical interventions VMMC and oral PrEP as a solution to HIV infection among men but emphasise consistent use of condoms

and HIV testing. Therefore, this approach offers a better prospect of addressing weaknesses in HIV prevention programmes and for producing significant and sustained reductions in HIV incidence in diverse settings.

Theoretical Framework

Concepts from the Health Belief Model (HBM) are employed in the study to examine the reasons why men may adopt or reject biomedical HIV prevention options. The HBM has six concepts: perceived severity, perceived susceptibility, perceived benefits, perceived barriers, cues to action and self-efficacy which predict how and why people take actions to prevent or control disease (Champion and Skinner, 2008; Janz and Becker, 1984). For the purposes of the study, the HBM was embedded in the Social Ecology Model for Communication and Health Behaviour (SEMCHB). The interpersonal level of the SEMCHB allowed the researcher to understand influences of social relationships on an individual's perception of biomedical HIV prevention methods, VMMC and oral PrEP and how these can affect adoption or rejection of them.

Another framework employed was the Risk Compensation Theory (RCT) which assisted the researcher gain an understanding of how individuals perceive risk and the benefits of safe behaviour and how this is realized in their actions.

Research Aims and Objectives

The primary objective of this study is to conduct a small-scale qualitative study to identify the possibility of risk compensation and decision-making process in the uptake of biomedical HIV prevention interventions with rural and peri-urban African men in Umlazi and Vulindlela, South Africa. The study aims to contribute to understanding men's perception of risk and how those perceptions influence the uptake of VMMC and oral PrEP as HIV prevention methods.

HIV prevalence in South Africa has remained high levels with men aged 15-49 years old identified as vulnerable to HIV infection as there are significant increase in risky behaviour (Shisana, et al., 2014).

There has been a reported perceived low risk of HIV infection among men and this correlates with low HIV testing rates (Shisana, et al., 2014). Low risk perception can result in an increase of risky behaviour such as, multiple sexual partners and a decrease in condom use.

There have been several behavioural HIV prevention interventions for example promoting the correct use of male condoms, reducing multiple and concurrent sexual partners, and increasing men's knowledge of their HIV status. Men are at risk of HIV infection and research has advanced to indicate the safety and efficacy of two biomedical option that can significantly

help men reduce HIV infection; medical male circumcision (MMC) and oral pre-exposure prophylaxis (PrEP) in the form daily dosing oral Truvada (UNAIDS & WHO, 2007; MacLeod, et al., 2007; Bailey 2010; Thigpen et al 2012; Van Damme, et al., 2012). MMC provides a partial protection for males in getting HIV infection as shown by the significant increase in voluntary male medical circumcision (VMMC) from 2 268 519 in 2008 to 3 301 196 in 2012 (Bailey, 2010; Shisana, et al., 2014). While oral PrEP has an efficacy of over 62.2% if strictly adhered to as part of an inclusive HIV prevention package (Thigpen, et al., 2012).

However, there is a risk of the misconception of VMMC as a panacea against HIV infection which could have a negative effect on other preventative methods (Peltzer, 2007). In a research conduct with men in the KwaZulu-Natal (KZN) province on VMMC, it was revealed that a misinformed concept of HIV transmission still exists, and this misunderstanding may be the cause of the current state of HIV incidence rates (Mathew, 2012).

Research questions

The research questions that underpinned this study are:

1. What is the risk compensation to the adoption of biomedical HIV prevention strategies?
 - Do men perceive a need for condom use and partner reduction upon the adoption of biomedical HIV preventative options?
2. Does age and/or location disparity influence risk compensation in biomedical HIV prevention options?
 - How do the participant's demography and physical environment affect their decision-making process?
3. What are the key determinants that influence men's choices of biomedical interventions as HIV preventative measures?
 - What are the perceived risks for HIV infection?
 - What are the perceived benefits of biomedical preventative options?
 - How do social factors influence perceptions of biomedical interventions as HIV preventative measures?

Location of study

The study is located in Umlazi and Vulindlela in KwaZulu-Natal. KwaZulu-Natal is reported to have the highest HIV prevalence in South Africa with 27% of people aged 15-49 years old living with HIV (Human Sciences Research Council, 2018; Shisana, et al., 2014). The researcher conducted the study in two sites in KwaZulu-Natal with African male aged 18-39

years old to understand the factors that influence men's decision-making process in their uptake of HIV prevention methods and how they mitigate risk.

Vulindlela is a rural community with a population of over 250 000 people, situated 150km west of eThekweni, KwaZulu-Natal and has an HIV prevalence rate of 36.3% (Kharsany, et al., 2018).

Umlazi township falls under the South sub-district of eThekweni Municipality, and is located 24 kilometres south-west of eThekweni. Umlazi is the fourth largest township in South Africa, with an estimated population of 404 811; though the population may be underrepresented because there is a large proportion of informal settlements dwellers that may not be counted (eThekweni District Health Plan, 2015/16; Census, 2011). According to the eThekweni District Health Plan 2015/16, Umlazi falls under the sub-districts with high HIV prevalence rates including Greater Inanda/Tongaat and South sub-district (Pinetown and Hlengisizwe).

Structure of the dissertation

Chapter One provides a brief global landscape of HIV epidemic and covers the South African burden of the disease. It contextualises the study in KwaZulu-Natal, and identifies the guiding theories, aims and study objectives.

Chapter Two provides an overview of HIV/AIDS including HIV prevalence globally, regionally, and locally. The chapter discusses diverse methods of HIV prevention since the start of the epidemic leading to the introduction of VMMC and PrEP as HIV prevention methods that can reduce HIV prevalence among men.

Chapter Three discusses the theoretical framework that underpins the study. The study is located in the Health Belief Model, which assists the researcher determine individual's perception of changing health behaviour. The HBM is embedded in the SEMCHB and assists the researcher consider the context and settings of the individual and their potential influence. The Risk Compensation Theory assisted the researcher understand the perceptions of risk by individuals.

Chapter Four presents the research methodology and study methods. The chapter discusses and describes the research design, research paradigm, selection of participants, data collection and data analyses procedures. The chapter further discusses issues of transferability, ethical considerations, and credibility in the study.

Chapter Five presents the qualitative data collected through focus group discussion. Data was collected and analysed thematically.

Chapter Six provides a discussion and analysis of findings.

Chapter Seven presents the conclusions and recommendations based on the findings of the study.

Chapter 2: Literature Review

HIV and AIDS-Globally

The rapid spread of HIV and AIDS epidemic over the last three decades is unprecedented, from the few highly publicized cases in the early eighties to today where an estimated 32.7 million people have died of AIDS-related illnesses since the beginning of the epidemic (UNAIDS, 2019). The earliest known case of HIV infection was detected in a blood sample collected in 1959 from a man in the Democratic Republic of Congo (The AIDS Institute, 2011). In mid to late 1970s, doctors in the United States of America (USA) reported cases of patients with rare types of cancer, pneumonia and other illnesses among male patients who had sex with other men (The AIDS Institute, 2011). Knowledge, understanding, and literature pertaining to HIV and AIDS was insufficient and experts struggled with understanding the cause of the disease. It was not until 1983 when the Centre for Disease Control (CDC) in the USA listed groups at high at risk, which included people who inject drugs (PWID), partners of people with HIV, hemophiliacs and people who had at the time been to Haiti (AVERT, 2017). The lack of substantial information about HIV and AIDS magnified the panic and stigma surrounding the epidemic (AVERT, 2017).

Despite efforts to end this, stigma still exists in some parts of the world. There still is a lack of understanding about the virus, society in many instances still does not know how to tackle HIV and AIDS not only as a medical problem but a socio-economic one as well. As of 2019, 75 million people had been infected with HIV since its outbreak, while 38 million people were still living with HIV, and sub-Saharan Africa been the most heavily burdened, has 20.7 million people living with HIV (UNAIDS, 2019, 2020). As of 2018, statistics show that HIV has claimed more than 32 million lives, an estimated 79% of people with HIV know their status and globally, as of 2018, an estimated 23.3 million people are receiving antiretroviral therapy (ART) (WHO, HIV/AIDS, 2019).

HIV is a major global public health issue, which was, and to some extent still is, highly stigmatized. In the 1990s the United States of America immigration policy banned people with HIV from entering the country (AVERT, 2019). In July of 2002, UNAIDS reported that AIDS was the leading cause of death in sub-Saharan Africa, the same month where the Treatment Action Campaign (TAC) in South Africa won a judgment in the Constitutional Court that ordered the South African government to make Nevirapine available to all HIV positive pregnant women and their new-born children (South African activists win nevirapine court case - SciDev.Net, 2003 AVERT, 2019). In 2000, South Africa's President Thabo Mbeki expressed doubts of HIV being the exclusive cause of AIDS, he questioned the AIDS statistics, the dangers of antiretrovirals, and poverty as the cause of immune deficiency (Fassin and

Schneider, 2003). This led to the South African government stalling the rolling out of necessary drugs to aid people living with HIV. The controversy created by the 'denialism' phase was headed by other government controversies, government was seen to be wasting money on musical shows instead of messages for preventative measures, spending on unfounded treatment options and the racialization and conspiracy of the issues and disease (Fassin and Schneider, 2003). The conspiracy notion at the time was that the disease may have been part of a plot to eradicate the black population by the country's white population and the pharmaceutical industry (Fassin and Schneider, 2003). When HIV/AIDS first appeared in South Africa it had a 'black' face, interpreted as promiscuity amongst Black South Africans; with white leaders shown to be rejoicing at the elimination of black people by the disease. To the rest of the world the suspicion, conspiracy; to the level of the government may have been unfounded but this was a reality in South Africa given its historical past. South Africa has not moved on from the stigmatized views on HIV/AIDS. "Stigma can be described as a social construction of deviation from an ideal or expectation, contributing to a powerful discrediting social label that reduces the way individuals see themselves and are viewed as persons" (Parker and Aggleton, 2003: 197; Visser, et al., 2009).

HIV positive people are perceived negatively and are marginalized in society as carriers of a deadly transmissible disease, more so in the past than in current years, however, this notion still exists (Visser, et al., 2009; Deacon, et al., 2005; Herek, 1999). According to the People Living with HIV Stigma Index, one in every eight people living with HIV is still being denied health services because of stigma and discrimination (AVERT, 2019; Huffington Post, 2012). Stigma and discrimination related to HIV/AIDS exists globally, however it presents itself differently across regions, communities, individuals, and communities. It is often based on pre-existing prejudices and stereotypes which mainly focus on infidelity, responsibility, morality, deservedness, and sex work (AVERT, 2019; Visser, et al., 2009; Stigma Research, 2004). During a trial on HIV prevention, many young women stopped using vaginal gels and pills that would have helped them be HIV free because of stigma. These young women in South Africa reported that using the products could lead to being labelled as having HIV and feared the discrimination and isolation (Stigma Research, 2004).

HIV and AIDS is a complex epidemic and addressing it requires prevention strategies that are well-rounded and considered for specific geographical locations because a one-size fits all application in efforts towards the alleviation of HIV and AIDS will not win the global fight against the epidemic. The United Nations General Assembly's Political Declaration on Ending AIDS (in 2016) committed countries to the 90-90-90 targets, the aim of the targets is to have 90% of all people living with HIV to know their status; 90% of people diagnosed with HIV to receive

antiretroviral therapy (ART) and have 90% of people receiving ART having viral suppression by the end of 2020 (UNAIDS, 2020).

Internationally, there have been significant gains in the HIV testing and treatment cascade. By the end of 2019, about 81% of people living with HIV knew their status, 67% were accessing ART and globally 59% of people living with HIV had reduced the amount of HIV in their bodies (viral suppression). (UNAIDS, 2020). According to the Fifth South African National HIV Prevalence, Incidence, Behaviour and Communication Survey (SABSSM V), South Africa is on track with achieving the 90-90-90 targets. South Africa, by 2017 had accomplished 85-71-86, this highlights that more people need to be on ART (Human Sciences Research Council - HSRC, 2018).

The Fast-Track strategy aims to end the AIDS epidemic by 2030. The strategy, as a rapid scale up of effective HIV services, intends to have fewer than 500 000 new infections yearly (globally), and reduction of 75% across all populations with importance on vulnerable communities (men who have sex with men, sex workers, adolescent girls and young women, people who inject drugs, and prisoners). Achieving zero discrimination for people living with HIV and can enable meeting all the 90-90-90 targets. With each country designing its own Fast-Track approach and setting their own milestones (UNAIDS, 2014).

Brief overview of HIV and AIDS in South Africa and HIV Prevention

According to the World Health Organization (WHO), by the end of 2015, there were approximately 36.7 million people infected with HIV in the world (UNAIDS, 2016). In South Africa, in 2019, there were reportedly 7.5 million people living with HIV, 200 000 new infections and 72 000 people that died from AIDS-related illnesses (AVERT, 2020). HIV prevalence varies from region to region, the national prevalence rate is high at 13.5%, and KwaZulu-Natal has over 2 million people living with HIV which is more than the other provinces (MacDonell and Low, 2019).

The South African government has in the past employed behaviour related strategies to curb the high prevalence of HIV (Mathew, 2012). Behavioural change prevention strategies such as the Abstinence, Be Faithful and Condomise (ABC).

The ABC approach was largely popularized by the success of the Ugandan government in reducing HIV/AIDS infections through the promotion of abstinence, faithfulness (reduction in number of sexual partners) and use of condoms, especially for those who were sexually active and unmarried (Singh, et al., 2003; Moodley, 2007). The ABC approach focused on how individuals themselves can modify behaviour to minimize their potential risk of infection. This approach went on to become the foundation of HIV prevention in South Africa. South Africa's

stance to HIV/AIDS epidemic has been marred with controversy and that has been witnessed through the earlier policies on HIV and AIDS. However, in recent years it has become apparent that HIV and AIDS prevention strategies must consider the economic, socio-cultural, legal, political, and other factors (AVERT, 2016).

Campaigns such as the long-established Abstinence, Be Faithful and Condomise (ABC) have largely been challenged as there has not been a significant reduction in new HIV infections (AVERT, 2015; Mathew, 2012). The ABC approach largely focuses on individual behaviour to aid in the reduction of one's chance of becoming infected with HIV. The limitations to ABC as a prevention intervention is the lack of influence on people's sexual behaviour (Bhana and Peterson, 2009; Nota, 2016). Even with the educational programs enlightening people about the pitfalls of risky sexual behaviour, a great number of people continue to partake in risky sexual behaviour. According to Moodley (2007), many young South Africans still engage in risky sexual behaviour, such as, inconsistent condom use, not abstaining from sexual intercourse and not being faithful (limiting number of sexual partners). This demonstrates the limitations of prevention interventions solely focused on the individual level.

The most successful HIV prevention programme (worldwide) is the elimination of mother-to-child transmission (PMTCT), with a 70% reduction of new infections in children from 2000 to 2015 (Dehne, et al., 2016). Other successes include South Africa's ART programme after 2008 and after 2013, the condom programme, which entailed a target of fifty condoms being distributed per man per year (Dehne, et al., 2016).

Results from clinical trials have produced evidence of prevention efficacy of early antiretroviral therapy (ART), voluntary medical male circumcision (VMMC) and pre-exposure prophylaxis (PrEP) (Dehne, et al., 2016). Combination prevention programmes have aided in the reduction of HIV infection prevalence in eastern and southern Africa, by far the most burdened regions. Malawi, Tanzania and Namibia all show a decrease of adult new infections by 50% and 48% in South Africa (Dehne, et al., 2016).

The South African government proposed the Voluntary Medical Male Circumcision (VMMC) policy and programme in 2010 with the goal of reaching 80% HIV-negative men aged 15-49 years by 2015 (Shisana, et al., 2012, Mathew, 2012, SANAC, 2011). From the inception of the programme, there have been approximately 1,379,201 million circumcisions conducted (WHO, 2014). In a similar manner, the efficacy of the drug tenofovir disoproxil fumarate (TDF), on its own or in combination with emtricitabine (FTC) for use as pre-exposure prophylaxis (PrEP), has been established through clinical trials to prevent people from acquiring HIV. The addition of this HIV prevention option is important in providing options for people in the prevention of acquiring HIV, especially for those who have a higher risk. In 2016 South Africa

introduced National Policy on HIV Pre-exposure prophylaxis (PrEP) and Test and Treat (T&T). The objective of this policy was the reduction of the incidence of HIV infection by offering PrEP as an added option in combination prevention (Department of Health, 2016).

The larger issues that contribute to the spread of HIV are located in the social environment and include access to health services, poverty and under-development (Hittner, et al., 2016). In more recent times, South Africa has incorporated a “combination of structural, biomedical and behavioural approaches” in their method towards dealing with the prevention and treatment of HIV and AIDS (SANAC, 2011: 39). It was evident that a holistic approach would be more effective in the prevention of HIV and AIDS, which considers the underlying economic, socio-economic, political, cultural, and other contextual factors. The increased and expanding product pipeline of biomedical interventions should now be considered as the next trajectories for HIV prevention and treatment. These include the use of antiretroviral treatment (ART) for both the prevention and treatment of HIV and AIDS, medical male circumcision (MMC), male and female condoms and most recently the use of pre-exposure prophylaxis (PrEP).

Biomedical Traction in HIV Prevention

Despite research spanning over two decades there still remains no effective HIV preventative drug, microbicide, product or vaccine to prevent or reduce the risk of HIV infection. Numbers of people dying from AIDS related illnesses and those infected by HIV continue to increase the need for biomedical HIV preventative interventions. There are several products that are at various stages of development, some are currently in phase III efficacy trials (UNAIDS/WHO, 2007). Currently, on the recommendation of the WHO oral pre-exposure prophylaxis (PrEP) is available as an additional prevention choice for people who are at high risk of HIV infection (WHO, 2017).

Vaccines

The HVTN 502 or Merck V520-023 study, also known as the Step study, was a clinical trial that evaluated the safety and efficacy of an HIV vaccine (The Body Pro, 2007). The way the vaccine would work is to suppress the reproduction of HIV and eliminate HIV-infected cells. The objectives of the trial were to investigate whether the vaccine could help prevent HIV infection in HIV-negative people, if any participants involved in the trial became infected with HIV in the duration of the study, and if it helped decrease the virus detected in them.

Biomedical invention in the form of a vaccine was administered to the participants but there was also behavioural intervention in the form of risk-reduction counselling provided to participants of the study. The vaccine was ineffective as the trial did not meet its efficacy

endpoints and was suspended (The Body Pro, 2007). All trial participants were encouraged to return back to their study sites and continue with risk-reduction counselling.

The Phambili study (HVTN 503) was conducted in South Africa and was designed to investigate the safety and efficacy of the same Merck vaccine tested in the STEP study (HVTN 502) (The Body Pro, 2007). After the suspension of the STEP study, enrolment and vaccinations were paused in the Phambili trial (The Body Pro, 2007; Gray, et al., 2010). Other vaccine trials are still underway, and we are not yet close to finding a vaccine (Gray, et al., 2010).

In the South African public sector, from September 2016, the Universal Test-and-Treat (UTT) programme was introduced (Hirasen, Fox, Hendrickson, Sineke and Onoya, 2020). The aim of the programme is to reduce HIV transmission by making ART available to all HIV positive people, regardless of CD4 count. This means patients are initiated on ART on the same day as their HIV diagnosis. The combination prevention methods incorporated into the vaccine trials is important as it could finally shed light on the adherence issues. Receiving risk-reduction counselling, knowing status of HIV and other STIs could be the breakthrough needed in combating new infections. In the meantime, we need to explore other options, this brings the importance of UTT for those testing positive, referring those that test negative for VMMC, and initiating oral PrEP for those who are at high risk of HIV infection.

Microbicides

Microbicide is a term that refers to substances that are usually ARV based that can be used to help reduce the risk of HIV infection through sexual intercourse (AVAC, 2016; Nota, 2016). Microbicides are products under development that can be used vaginally or rectally to reduce the risk of HIV transmission through sexual intercourse. The product pipeline for microbicides includes films, creams, vaginal and rectal suppositories, gels, and intra-vaginal rings that would release the active ingredient over time. Currently there are no licensed microbicides available (AVAC, 2016).

There have been a number of trials conducted to investigate the effectiveness of microbicides as effective for HIV prevention: The VOICE, MTN 017, CAPOO4, FACT001, and ASPIRE trials; all concluded, and the products tested were found to be safe but not effective in preventing HIV (Karim and Baxter, 2012; Gafos, et al., 2013; Terris-Prestholt, et al., 2014).

The results of the clinical trials mentioned above and previous studies, emphasize the need for HIV prevention interventions that are better suited for the people they are intended for. Consequently, more research needs to be conducted to offer more choices in HIV prevention methods.

History of male circumcision

The origins of circumcision are a point of great debate, some believe that it dates back to time immemorial. Sir Graften Elliot Smith posits that circumcision has features of a heliolithic culture which has spread worldwide over thousands of years ago (Zampieri, Pianezzola and Zampieri, 2008). However, others believe that it may have its origins independently from many different cultures, such as in Africa, Indian, South-East Asia and the Australian Aborigines (Dunsmuir & Gordon, 1999; Adu-Gyamfi & Adjei, 2014). Circumcision is performed at different passages in life in each culture, some African tribes perform the procedure at birth, followers of Judaism perform the ritual on the eighth day after birth, Muslims consider it a 'rite of passage' that is performed in early life (Dunsmuir & Gordon, 1999). In Pakistan, a child is circumcised before they are discharged from the hospital (after birth) but if they have not been born in hospital, those in the rural parts of the country, circumcise their boys when they are between the ages of 5-7 and sometimes after adolescence (Adu-Gyamfi & Adjei, 2014). In Tanzania, the Kaguru practice on both girls and boys is regarded as a way of differentiating genders and for social control. They believe an uncircumcised penis to be 'dirty' because of its moistness and makes men resemble women, whose menstruation is considered as polluting (Adu-Gyamfi & Adjei, 2014).

In South Africa, ethnic groups have practiced circumcision over the years. The Tswana, the Sotho, the Shangaan, and the Zulu who until recently had altogether abandoned the practice. Some ethnic groups among the Xhosa people do not practice the circumcision ritual, such as the Bhaca, Ntlangwini, Mpondo and Xesibe (Vincent, 2008). The Xhosas who do practice the ritual view it as an initiation, a rite of passage from ubukhwenkwe (boyhood) to ubudoda (manhood). The ritual is performed for boys between 15-25 years old and it is a rather complex ritual, with many stages encompassing requirements to be met by the initiate. The ritual allows Xhosa males to become fully fledged members of their community, granting privileges, such as the ability to partake in the community (be part of the family court or stand in for their father), the right to enter into marriage, and to gain respect and knowledge which would otherwise be unattainable (Vincent, 2008). The South Sotho's Chief admonished young boys, usually those aged between 16 and 20, to participate in the ritual because it is believed that "each element of this complex initiation scenario has a cultural and symbolic meaning" (Twala, 2007: 26).

There are no reports of ancient cultures practicing circumcision for hygiene reasons. In the late nineteenth century, mass circumcision was introduced for health reasons, only then did doctors seek to legitimize the practice, with attempts to explain it as a recommendation for proper personal hygiene (Adu-Gyamfi & Adjei, 2014). English surgeon James Copeland suggested that not circumcising was the cause of masturbation, while WH Cornfield claimed

that circumcision was “an antidote against infections”, and James Allen also purported the same that the origins of circumcision can be traced as a practice to prevent parasitic infections (Adu-Gyamfi & Adjei, 2014: 732). Circumcision is a major, invasive, and irreversible procedure.

Medical Male Circumcision

In 2007, the Joint United Nations Programme on HIV/AIDS (UNAIDS) and WHO endorsed male circumcision for HIV prevention as part of all HIV prevention programmes in 13 sub-Saharan African countries, namely, South Africa, Lesotho, Swaziland, Zimbabwe, Botswana, Namibia, Mozambique, Rwanda, Kenya, Malawi, Uganda, the United Republic of Tanzania, and Zambia (UNAIDS & WHO, 2007; 2011; 2013). These particular countries have the highest HIV prevalence rates in the world (UNAIDS & WHO, 2007; 2011; 2013).

The promotion for VMMC in South Africa was in the wake of evidence revealed in three randomized controlled trials that medical male circumcision reduced the risk of HIV infection through male-to-female transmission by up to 60% (Auvert, et al., 2005; Bailey, et al., 2007; Gray, et al., 2007). Mehta, *et al* (2013: 2899) in their study also posit the same, that medical male circumcision reduces the risk of HIV acquisition by almost 60% over a period of 24 months. According to this study, the implementation of VMMC could gradually reduce the HIV infection rate in men by at least 60% and 30-40% reduction in women. In the wake of these studies, the South African Department of Health's National Strategic Plan on HIV, STIs and TB has incorporated Voluntary Medical Male Circumcision (VMMC) as a strategy aimed at curtailing the acquisition and transmission of HIV.

Circumcision is the surgical removal of the foreskin either in whole or in part (Abdulwahab-Ahmed and Mungadi, 2013). The removal of the foreskin (circumcision) has many health benefits, such as, improving personal hygiene as it is easier keeping the head of the penis clean; reduces the risk of sexually transmitted infections (STIs) for example herpes, syphilis, human papillomavirus (HPV) and genital warts; reduces risk of penile cancer; and reduces the female partner's risk of cervical cancer. There are many reasons for men to undertake circumcision, cultural reasons, religious reasons, and health reasons. There are certain precautions that men must adhere to pre- and post-procedure: the men have the right to voluntary counselling before the procedure and an HIV test; the procedure is conducted by a trained medical professional; the men are encouraged to clean the wound daily and not engage in any sexual activity until six weeks after the procedure and only engage in light exercise (Brothers For Life, 2016).

The Bophelo Pele (Health First) project was the first programme created to implement the WHO/UNAIDS guidelines on MMC in real-life settings (Lissouba, et al., 2010; Mathew, 2012). The project commenced in 2008 in the township of Orange Farm and wanted to establish the practicability of MMC implementation in low-income communities, with low circumcision rates and high HIV prevalence rates. The aim of the project was to establish whether MMC could be rolled out effectively in the rural areas. The findings of the study reported that the rollout of MMC within low-income settings was achievable and could be executed safely in keeping with international standards (Lissouba, et al., 2010; Mathew, 2012).

The South African government rolled out a national medical male circumcision program, which was introduced in 2010 and based on guidelines adapted from WHO (Tchuenche, et al., 2018). The province with the highest HIV prevalence and lowest rates of circumcision was marked as the first province to receive the MMC rollout programme, this was in KwaZulu-Natal (Meyer, et al., 2011; Mathew, 2012). The MMC rollout in the beginning used medical clinics, hospitals and mobile sites, also known as 'camps'. The camps used the participation of local stakeholders and community mobilisers where MMC services were provided. There were two methods used by the majority of the medical sites in KZN, which were the Tara Klamp device and the forceps guided method to medically circumcise men. The Tara Klamp device has not been sanctioned by WHO, it was used exclusively in KZN, however, the forceps guided method was accepted by WHO (Mathew, 2012).

SANAC drafted the National Implementation Guidelines for Medical Male circumcision, with other vital contributors. The National Strategic Plan 2012-2016, assured to continue with a large-scale rollout of medical male circumcision (SANAC, 2011). As of 2014, there have been over 1.3 million MMC procedures performed in South Africa since 2010 (WHO, 2017).

The SANAC provided guidelines that an individual is required to take an HIV test and undergo counselling before undertaking the circumcision procedure. During the counselling session, the men are meant to be educated about ways of taking care of themselves post operation and their behaviour and are also informed about the need to continue to use other HIV preventative measures despite having undergone circumcision. The pre-testing (HIV) affords the health care provider an opportunity to suggest to those who test HIV-positive to start ARV treatment, and advice those HIV-negative on how to maintain their status and to proceed with the MMC procedure (SANAC, 2011; Mathew, 2012).

A question of quality and adequacy of some of the health care facilities charged with providing the MMC programme was raised by the Treatment Action Campaign. They cast a shadow of

doubt over the health care provider's ability to provide thorough knowledge of HIV preventative interventions and proper counselling to prospective MMC candidates.

Pre-exposure Prophylaxis (PrEP)

Pre-exposure prophylaxis (PrEP) is an HIV prevention method that involves the use of antiretroviral medications (ARVs) to help reduce the risk of HIV infection for people that are HIV-negative (AVAC, 2016). Clinical trials show evidence of PrEP under strict adherence, used daily to be beneficial in the reduction of HIV transmission in both men and women (Idoko, et al., 2015, Nota, 2016). The ARV contained in the oral PrEP medication currently being used in clinical trials are tenofovir-based regimens, using TDF (an antiretroviral containing tenofovir) or FTC (emtricitabine, sold under the brand name, Truvada) (AVAC, 2016).

The use of daily oral PrEP is safe and there have been no significant side effects detected in current and previous trials. Strict adherence is key, and PrEP will only work if one takes the medication. In the clinical trials, it was reported that people who had high levels of adherence had high levels of protection and the inverse was true, those with low adherence, had low to no protection from infection (AVAC, 2016). PrEP offers high protection to both men and women. And as with any ARV-based medication, people should note that resistance to PrEP medication can occur, but this is in cases where a person starts PrEP without HIV diagnosis or in cases where one acquires HIV and keeps taking PrEP. For PrEP to work safely and effectively one needs to confirm their HIV-negative status, take PrEP correctly and consistently and keep getting HIV tests periodically, there will be a diminutive risk of acquiring HIV or becoming drug resistant (AVAC, 2016).

The UNAIDS in 2015, accepted guidelines from the WHO to reduce the transmission of HIV. The aim of the new guidelines is to fast-track HIV prevention interventions, as well as improving the lives of people living with HIV¹. According to WHO, antiretroviral medication should be given to people as soon as they are diagnosed with HIV, regardless of their CD4 count. Also, antiretroviral medication (such as PrEP) should be available and accessible to people in high-risk populations.

Clinical Trials

Testing the safety and efficacy of a new drug or device can be determined through clinical trials. The human trial phase new drugs are tested through rigorous and extensive laboratory

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http://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2015/november/20151130_PS

research involving animals and human cells². Initial studies in non-human primates indicated that daily dose-dependent administration of an oral TDF and FTC or a combination of the FTC and TDF (Truvada) could prevent or delay the acquisition of simian or simian/human immunodeficiency virus (SIV/SHIV) in macaques (Garcia-Lerma, et al., 2010). This evidence fuelled interest in testing the efficacy of PrEP in humans.

Human testing of new experimental medicines is conducted in four phases.³ Phase I, is conducted to assess the safety of a drug and will generally involve a small group of volunteers. This stage is to establish the effects of the medication on humans, how it is metabolized, absorbed, and eliminated from the body. As the dosage is increased, the side effects of the drug are observed⁴. Phase II can take anything from more than a few months to 2 years. This stage tests the efficacy of a drug. The studies of this phase are often randomized meaning the groups are divided into two, one group receives the experimental drug, and the other “control” group receives a placebo. The researchers and the patients do not know who receives the experimental drug or the placebo, this is referred to as “blinded”. This enables the pharmaceutical companies and the relevant regulatory board/body to obtain comparative data about the effectiveness and safety of the new medicine⁵.

Phase III is large scale testing and involves quite a number of participants, from several hundreds to a few thousands, and can last for a number of years. This randomized and blind testing provides the regulatory body and pharmaceutical company a thorough knowledge of the safeness, efficacy, the possible side effects, and the benefits of the drug. There are quite a number of phase III trials for PrEP that have been concluded, including but not limited to, the Bangkok Tenofovir study, CDC 494 (in Botswana involving both heterosexual men and women), FEM-PrEP, IPERGAY, iPrEx and Partners PrEP (AVAC, 2016). The final, phase IV, also referred to as “Post Marketing Surveillance Trials” is the stage where a drug has already been certified for commercial sale. At this stage, a pharmaceutical company would be trying to ascertain a few things, firstly comparing a drug with other existing drugs already available; examine the long-term effectiveness of the drug and determine the cost-effectiveness of the drug. The results of these findings could see the drug taken off the market or resulting in restricted use⁶.

² <http://www.centerwatch.com/clinical-trials/overview.aspx>

³ <http://www.centerwatch.com/clinical-trials/overview.aspx>

⁴ <http://www.centerwatch.com/clinical-trials/overview.aspx>

⁵ <http://www.centerwatch.com/clinical-trials/overview.aspx>

⁶ <http://www.centerwatch.com/clinical-trials/overview.aspx>

Evidence of the Safety and Efficacy of Antiretroviral Prophylaxis

In 2010, a phase III randomized, placebo-controlled trial was conducted with clinical sites in Brazil, Ecuador, Peru, South Africa, Thailand and the United States- called the Pre-exposure Prophylaxis Initiative (iPrEx) trial, with 2499 participants with the aim of evaluating the efficacy and safety of once-daily oral FTC-TDF [emtricitabine (FTC) and tenofovir disoproxil fumarate (TDF)] for the prevention of HIV infection among men and transgender women who have sexual intercourse with men (Grant, et al., 2010). iPrEx reported a 44 per cent reduction in the risk of HIV acquisition from using once-daily oral FTC-TDF as part of a comprehensive prevention package. Daily dosing oral PrEP with TDF/FTC was recommended as an HIV prevention method because this trial proved the efficacy and safety, when adherence to the medication was high (Grant, et al., 2010).

The Partners PrEP trial was a study conducted to test the safety and efficacy of a daily oral TDF-FTC or TDF for the prevention of HIV infection for heterosexual serodiscordant couples in Kenya and Uganda (Baeten, et al., 2012). The trial was unfortunately halted prematurely after an interim analysis showed evidence of significant efficacy in the groups receiving the drugs (TDF/FTC or TDF) in comparison with the placebo group. The study participants exhibited high adherence to the medication, 98 per cent by pills dispensed, 92 per cent by pills counted and 82 per cent by plasma drug-level testing in both the TDF and TDF-FTC groups (Baeten, et al., 2012). TDF revealed an efficacy percentage of 63 for men and 71 per cent for women, whilst the TDF-FTC group demonstrated an efficacy rate of 84 per cent for men and 66 per cent for women. For both sexes combined the efficacy estimates for the ARV regimens were 67 per cent for TDF and for TDF-FTC 75 per cent as compared with the placebo (Baeten, et al., 2012).

Another trial involving 1219 participants in a serodiscordant relationship was conducted in Botswana, studying the safety and efficacy of daily-dosing oral TDF-FTC (Truvada) (Thigpen, et al., 2012; CDC, 2014). The trial established that an efficacy rate of 62 per cent of the study drug in reducing the risk of HIV infection for both sexes. Medication adherence was checked through pill counts and it reported 84 per cent in both groups (placebo and TDF-FTC). Side effects experienced by some participants in the TDF-FTC group included vomiting, nausea, and dizziness, but was primarily within the first month of use (Thigpen, et al., 2012; CDC, 2014). Adherence was higher in this study than in iPrEx, and this could be hypothesized to be the result of the perception of risk when people know their partners have already contracted HIV (Nicol, et al., 2013).

The FEM-PrEP trial was a study conducted in 3 African countries, Kenya, South Africa, and Tanzania (Van Damme, et al., 2012). The purpose of the trial was to establish the safety and

efficacy of daily TDF-FTC among 2120 heterosexual women. An interim analysis resolved that there was an unlikely chance the trial would detect a significant difference in efficacy between both the medicated group and the placebo group, and the trial was discontinued. TDF-FTC did not show significant efficacy in the study as being able to help prevent HIV infection and this was linked to low drug adherence (Van Damme, et al., 2012). Self-reported drug adherence among the participants was 95 per cent but drug-level testing exposed evidence of much lower levels of adherence. Van Damme, et al. (2012) postulate that the women's perception of risk of HIV infection (which was low or no risk) possibly contributed to the low adherence.

The Bangkok Tenofovir study enrolled 2413 participants to assess the use of daily-dosing oral use of tenofovir, as a risk reduction prevention method among people who inject drugs (PWID) (Choopanya, et al., 2013). Adherence was notably higher in participants who were forty years and older than in the younger participants. A number of 193 participants (8 per cent) disclosed that they had shared their study drug with others, while 121 participants took pills from other participants and 18 per cent (158) participants revealed they had shared their pills only once (Choopanya, et al., 2013). The treatment as part of the study was administered as a part of other HIV prevention services at drug-treatment clinic, daily- dosing tenofovir decreased the risk of HIV acquisition by 48,9 percent in PWID. There was higher adherence noticed in women (79 per cent) and in people aged forty years and older, 89 per cent, these were the sub-groups who notably had higher adherence (Choopanya, et al., 2013).

Results from three randomized, placebo-controlled trials have illustrated the efficacy of daily-dosing tenofovir or tenofovir-emtricitabine in decreasing the risk of HIV infection. But results from two other trials were not successful and revealed no indication of tenofovir or tenofovir-emtricitabine being effective in preventing HIV infection. Based on the findings of these studies, one can safely conclude that adherence is a key determinant in the efficacy of a study drug. We can deduct from the aforementioned trials that a need for options to aid people using PrEP to maintain effective levels of adherence exists.

PrEP in Africa

Currently, availability of oral PrEP is limited. The United States of America (USA) was the first country to license oral PrEP in the form of a pill, brand name "Truvada", in 2012 (PrEPWatch, 2021). Since then, a handful of other countries have followed suit, Canada, France, Kenya, Israel and South Africa (AVAC, 2015). Currently, in 2021, twenty-two African countries including South Africa have PrEP programmes (Home – PrEPWatch, 2021).

Kenya has an estimated 1.6 million people living with HIV, a national prevalence rate of 6 per cent, and an estimated 101 560 new infections in the year 2013 (Ministry of Health, 2014).

The Kenyan government proposed a shift away from their previous prevention paradigms (i) move away from intervention driven to population driven (ii) shift from a heavy reliance on biomedical intervention to focusing on combination prevention which offers a package of behavioural, biomedical and structural programmes; (iii) develop structures where HIV prevention becomes everyone's problem not just the health sector and (iv) a move from top-down strategies of a national policy but to a geographical approach in HIV prevention interventions (Ministry of Health, 2014). These efforts are in conjunction with reaching their countdown to 2030 goal of zero new infections.

Kenya's Pharmacy and Poisons Board (PPB) approved Truvada (TDF/FTC) for PrEP for adults who are deemed high risk of acquiring HIV in December of 2015 (AVAC, 2015). The guidelines set by the Kenya Ministry of Health prescribe that oral PrEP should be proposed to HIV-negative people who are at a higher risk of contracting HIV; and people who are involved in serodiscordant relationships during attempts to conceive. PrEP should only be offered as part of combination prevention package and only after thorough assessment of individuals to assess eligibility, willingness for correct and effective use, and on-going assessments (Ministry of Health, 2016). The Ministry of Health has set strict criteria for those who are possible candidates to be offered PrEP.

PrEP in South Africa

WHO defines a group at substantial risk of HIV infection as "a population group with an HIV incidence greater than 3 per 100 person- years in the absence of PrEP" (National Department of Health, 2016: 4). HIV prevalence is diverse across the different provinces of South Africa and there are some populations that have been identified as having a higher risk to HIV infection, specifically sex workers (SW) and Men who have Sex with Men (MSM). Adolescent girls and young women (AGYM) are also demarcated as a particularly vulnerable population (National Department of Health, 2016). For HIV interventions to be effective a complete understanding of the HIV prevalence is essential, so that effective and efficient HIV interventions can be developed and employed.

On 3 December 2015, the Medicines Control Council (MCC) released a statement detailing the approval of the use of tenofovir fumarate and emtricitabine for use as PrEP for HIV-negative people for the prevention of HIV infection (South African Health Products Regulatory Authority, 2015).

The National PrEP and test and treat (T&T) policy provides guidelines for the facilitation of PrEP and test and treat (T&T) for sex workers as part of an all-inclusive combination prevention and extended policy treatment package (National Department of Health, 2016). In

the context of the guidelines, sex workers include: “women, men and transgendered populations, who sell sex regularly and occasionally, and those who may or may not self-identify as sex workers” (National Department of Health, 2016: 2).

According to the SA Health Monitoring Survey of Female Sex Workers (SAHMS-FSW), HIV prevalence differs for provinces among female sex workers, with Cape Town at 39.7 per cent, eThekweni at 53.5 per cent and 71.8 per cent in Johannesburg. As female sex workers become older, the HIV prevalence increases. The SAHMS-FSW report stated that comparing HIV prevalence among women 16-24 years and women 25 and older, there was a significant difference (eThekweni 29.4 per cent v. 71.2 per cent; Johannesburg, 59.0 per cent v. 78.8 per cent) (National Department of Health, 2016). These figures confirm that sex workers are heavily burdened by HIV more than other population groups showing why the South African government has deemed them a priority group to roll-out PrEP and T&T to first. This proves the urgency to focus on HIV prevention interventions to aid HIV-negative sex workers not to become infected. The Guidelines for Expanding combination prevention and treatment options for Sex Workers: Oral pre-exposure prophylaxis (PrEP) and Test and Treat (T&T), are in line with the National Strategic Plan 2017-2020 of “Nobody Left Behind” which entails ensuring that all key and vulnerable populations are reached through programmes adapted to their specific population. Identified key populations include people living with HIV (PLHIV), sex workers, migrants, miners, men who have sex with men (MSM), transgendered people, inmates, and people who inject drugs (PWID) (National Strategic Plan 2017-2020; 2017).

Challenges of PrEP

Challenges to scale-up programs is largely in the ability of effective programmes that are designed to deal with social and structural determinants of health, including inequality, poverty, and unemployment (Andermann, 2016). It is also in customizing combination prevention interventions that are specific to different population groups, especially those with high-risk behaviour profiles or legal/social issues that intensify their vulnerability (Coates, T.J., Richter, L. and Caceres, C., 2008; HIV prevention programmes overview, 2021). And lastly, it is in maintaining adherence to treatment programs, the period between diagnosis and the start of treatment.

The South African landscape is unique, prevention strategies that may have worked in other parts of the world, may not necessarily work here (Campbell & Mzaidume, 2002). Even more so, South Africa is a very diverse nation and even interventions that work in other provinces may fail to work in others. This illustrates the importance of always tailoring messaging and prevention strategies to the targeted population (Zuma et al. 2019). Any biomedical intervention will have to include behavioural intervention that incorporates social, cultural, and

structural factors. The preventative options available are great and many, however, if people still find it difficult to uptake them these interventions become white elephants. The current study seeks to understand the barriers to uptake for men wanting to and already accessing biomedical options.

Figure 1: PrEP Initiations by Country (AVAC, 2021)



Risk Compensation

Risk compensation, also sometimes referred to as behavioural disinhibition, is an increase in risky behaviour in response to the perceived risk reduction following an intervention. Risk compensation is an important possible mechanism that could negatively impact the effectiveness of VMMC programs (Westcamp, et al., 2014: 1764). The concept of risk compensation has been theorized into the field of health, more specifically to HIV prevention in terms of condom use, medical male circumcision and recently the use of pre-exposure prophylaxis (Cassell, et al. 2006; Blumenthal & Haubrich, 2014).

Advances in health care interventions come with conjecture about the inadvertent and possibly damaging consequences of introducing new interventions. In preventative medicine, these unintended consequences can be referred to as risk compensation (Adam, 1995; Hogben & Liddon, 2008). Risk compensation can be explained as a situation where a person feels protected from one health risk, then partakes in other risky behaviour that places them in an overall greater risk for the same or other health problems (Hogben & Liddon, 2008). The idea of risk compensation is largely based on the works of John Adams (1995), which primarily

focused on the compelling interplay between car seat belts and car accident risk. Adams (1995) suggested that car drivers that wore seat belts perceived themselves at less risk of harm and therefore are more likely to drive a bit more recklessly, which has the potential to increase accident rate overall (Mathew, 2012). According to Adams (1995), the rate of deaths among cyclists, pedestrians and back seat passengers increased after the UK's seat belt law came into effect. An increase of fatalities for cyclists, pedestrians, and back seat passengers by 13 per cent, 18 per cent and 25 per cent, respectively, was experienced (Harvey & Durbin, 1986; Mathew, 2012).

During the 1960's and 1970's, sexually transmitted disease (STD) treatment was alleged as a risk for increased risky sexual behaviour, and the human papillomavirus (HPV) vaccines in schools were a cause for concern, in that it was believed that young women might initiate unprotected sexual intercourse at an earlier age, as they felt free from fear of the cancer-causing disease (Hogben & Liddon, 2008). Hearst and Chen (2004) among other researchers have hypothesized that the low success of condoms in reducing HIV infection was attributed to risk compensation. The notion behind this is based on the idea that a low perceived risk of HIV infection can lead to inconsistent condom use and carelessness of the number of sexual partners one engages with.

Concerns of risk compensation endanger the reliability of the protective benefits of HIV preventative measures such as, MMC and PrEP. In keeping with the theme of my dissertation, I will explore the evidence related to risk compensation in the case of medical male circumcision and oral pre-exposure prophylaxis.

Risk Compensation and VMMC

Literature on sexual risk behaviours among circumcised males is mixed. Whereas some studies suggest that SMC is not associated with increased sexual risk behaviours, others show that it might engender a sense of being "protected" from HIV infection, thereby resulting in increased risk-taking (Ediau, et al., 2015: 1).

Studies investigating the issue of risk behaviour between circumcised and uncircumcised men date back to the late nineties. Seed, et al. (1995) carried out one of the first studies exploring the risk of HIV infection of circumcised men compared to uncircumcised men, but the study was not focused on risk compensation. This study revealed that circumcised men within the study had more sexual partners, engaged more in transactional sex and reported higher incidence of STIs than their uncircumcised counterparts. Although the circumcised men exhibited riskier behaviour, they still composed of fewer HIV-positive people than the

uncircumcised group. The authors of this study recognized a further need for research to ascertain the core causes of the higher risk profile quite noticeable amongst the circumcised individuals. Later, the results of the 3 RCTs detailed below supported the findings of this initial study and indicated a cause for concern for risky sexual behaviour exhibited by circumcised men.

There were three randomized controlled clinical trials that further investigated this relationship between sexual risky behaviour and circumcision, with results that differed from region to region. In Kenya (Bailey, et al., 2007), a decline in inconsistent condom use in the control group but not in the intervention group after going through counselling on behaviour after a period of two years was reported. However, the Ugandan trial (Gray, et al., 2007) showed no indication of reported risky sexual behaviour, even in follow-up studies (Kong, et al., 2012). In South Africa (Auvert, et al., 2005) the results were different. The circumcised individuals reported during their follow-ups (4-21 months) after undergoing circumcision that they had more sexual partners. The participants of these studies received counselling and thorough health education during the trial period, therefore, these results may not truly reflect the actions of men who would undergo the circumcision procedure in real-life settings. This is a limitation of studies based on clinical trials.

Over the years, there have been a number of studies (Agot, et al., 1999; Riess, et al., 2010; Ayiga, et al., 2011; Grund & Hennink, 2012; Abbott, et al., 2013; Kibira, et al., 2014; Westercamp, et al., 2014; Chikutsa, et al., 2015; Ediau, et al., 2015; Kibira, et al., 2016) conducted to examine the relationship between male circumcision and sexual risk behaviour.

Grund & Hennink (2012) conducted a study in three urban districts in Swaziland, Mbabane, Matsapha and Manzini. The participant criteria included men who were over 18 years old, who had been circumcised within the previous 12 months. There were thirty-three participants who agreed to in-depth interviews. The recruitment process followed a specific design which sought men according to time after their circumcision procedure; at six weeks, six months, and twelve months post operation. The time intervals sought to discover when men resumed sexual intercourse after circumcision, how men's perception of circumcision changed with time and ascertain if men's perception of risk and sexual conduct changed when some time had passed.

A number of men reported to have changed their attitudes towards risky sexual behaviour following their circumcision procedure. This was accomplished by a reduction in sexual partners and consistent condom use. Some men admitted to being tempted to not use condoms and even "slipping" and not using condoms sometimes because "they viewed their

circumcised status as providing added protection from HIV transmission, therefore acting as a “back-up” safety measure during such oversights” (Grund & Hennink, 2012: 249). A few men cited a need to engage in unprotected sex to satisfy a desire to be adventurous and have several sexual partners for a brief period after becoming circumcised.

The conclusion of the study was that more men changed their risky sexual behaviour and engaged in safe behaviour that was more protective of HIV transmission. However, it must be noted that “some men in this study also reported increased sexual risk-taking behaviours after circumcision, which demonstrates that some evidence of risk compensation is evident” ((Grund & Hennink, 2012: 249-250).

The Rakai, Uganda RCT was another of the study on risky sexual behaviour and MMC. But though the Rakai, Uganda RCT was suspended in December 2006, the male participants were enrolled into post-trial surveillance study (with their consent) (Kong, et al., 2012). The post-trial study involved 2137 uncircumcised, HIV-negative men who engaged in risky behaviour. They were observed for a period of three years after the initial trial. Almost half of the participants were younger than 25 and becoming sexually active during the study period. Both circumcised and uncircumcised men decreased their utilization of condoms, but this change was due to many of them becoming married and use of condoms in this population within marriage is low (Kong, et al., 2012).

Several factors may have contributed to the significant changes in sexual behaviours in both the circumcised and uncircumcised men. The first is that the population was growing older and, thus, more likely to marry and engage in sex. The second is that, during the 2-year trial period, all participants received repeated intensive education and counselling and free condoms... (Kong, et al., 2012: 881).

The authors posited that their empirical data did not indicate that risk compensation was associated with medical male circumcision.

In 2010, the Ugandan Ministry of Health and key stakeholders launched a guiding policy for the national safe circumcision programme, which included a comprehensive national communication strategy (Kibira, et al., 2016). The large-scale programme promoted circumcision as an intervention with the potential to reduce HIV infection. However, there were concerns for the potential of risky sexual conduct.

Data collected for the Ugandan AIDS Indicator Survey (UAIS) for the year 2004 and 2011 was analysed for a study to be able to compare sexual risk behaviours and HIV sero-prevalence

among circumcised and uncircumcised men. The study made use of individual interviews where men described their individual perceived risk of HIV infection, sexual risky behaviours and understanding of the protection male circumcision offers against HIV acquisition. The study sample totalled 14 875 men (6 906 in 2004 and 7 969 in 2011) between the ages of 15-59. The completed study indicated:

A higher prevalence of sexual risk behaviours among circumcised men in each survey and lower prevalence in use of condoms with non-marital sexual partners among circumcised men, suggesting possible risk compensation among some circumcised men (Kibira, et al., 2016: 9).

Circumcised men tended to be from urban areas and more educated than their uncircumcised counterparts. There was a higher prevalence for risky sexual behaviour from circumcised men, when compared to uncircumcised men for both survey periods. For the period of 2011, circumcised men reported less use of protection (condoms) during their last non-marital sexual encounter (Kibira, et al., 2016). These results show evidence of risk compensation among men who have been circumcised, which is a negative for MMC programmes, as this reveals that some men perceive that MMC is a panacea for HIV. This has the potential to have detrimental consequences for MMC intervention programmes.

Similarly, a study conducted by Chikutsa, et al. (2015) in Zimbabwe based on the data from a 2010-11 demographic and health survey established that a correlation existed between MMC and risky sexual behaviour. A total of 7480 men aged 15-45 years who had been interviewed for the survey were included in the sample group for this study. The men were questioned about their sexual behaviour and circumcision status. Of the 7480 men included in the study, 90.8 per cent reported to not being circumcised and only 9.2 per cent were circumcised. The uncircumcised men were asked if they would uptake circumcision if it were freely available and only 30% of the men expressed a willingness to undergo the procedure. Younger men, 25-34 years old were more likely to be open to becoming circumcised compared to their older counterparts (45-54 years old) (Chikutsa, et al., 2015). According to the study, there was a relation between wanting to become circumcised and engaging in risky behaviour; behaviour such as, inconsistent condom use, and multiple sexual partners. In summary the study revealed that “in terms of risky sexual behaviours, men who want circumcision are likely to have not used a condom during their last risky sex and have higher odds of having risky sex, of having multiple sex partners and of having ever paid for sex.” (Chikutsa, et al., 2015:7)

The study postulates that men who express a willingness to become circumcised are more likely to engage in risky sexual behaviour.

A study conducted in eastern Uganda, in Mbale and surrounding districts, where circumcision is practiced traditionally, involved 310 adult men between the ages of 18-35 years and all the men were circumcised. The findings of this study show that the men were more likely to engage in risky sexual behaviour post circumcision, which included an increase in the number of sexual partners, inconsistent condom use and introducing new sexual partners in their lives (Ediau, et al., 2015). Most of the male respondents had been circumcised traditionally. Traditional circumcision is practiced as a ritual (a rite of passage) and is not associated with HIV prevention. Therefore, there are certain aspects of the practice that may undermine the potential preventative aspect of circumcision, such as, there is no risk behaviour counselling offered during this rite, the men often times engage in sexual intercourse shortly after their procedure, forgoing the required six-week healing period. Of most concern with traditional circumcision is that the same knife is used to circumcise a number of men which can be detrimental as HIV transmission could occur (Ediau, et al., 2015).

The authors concede that there are certain limitations to their study such as respondents' recollection may not be definitively accurate as a number of years have gone by between the practices before and post circumcision. A recommendation was that risk reduction interventions should go beyond medical circumcision and integrated into traditional circumcision, but the possibility of this remains to be seen as traditional circumcision is a highly sacred ritual.

Earlier studies of the relationship between risk compensation and MMC were based on clinical research participants who may have reported what they thought the researchers wanted to hear and not their true actions. It is important to note that the accounts shared in these studies during and after clinical trials will have variances with real-life settings.

PrEP and Risk Compensation

Results from four RCTs (Grant, et al., 2010; Baeten, et al., 2012; Thigpen, et al., 2012; Choopanya, et al., 2013) have shown evidence that oral antiretroviral pre-exposure prophylaxis is effective in protecting against HIV infection. The results of these trials have encouraged hope in the world in making strides to combat the HIV/AIDS epidemic. However, these results are marred with the possibility of people increasing risky sexual behaviours while using PrEP and thwarting the benefits of this HIV preventative measure.

During the clinical trials there was no significant change in participant's sexual behaviour reported between the control group and the intervention group. Therefore, risk compensation was not deemed a factor. Mugwanya et al. (2013) postulate that possible limitations of the

RCTs were, firstly, the participants did not know if they were part of the intervention group or the control group, secondly the participants did not know the benefits of the study drug. Hence, risk compensation was not a factor. This is not an indication of sexual behaviour in the context of individuals knowing the beneficial properties of PrEP.

Guest's, et al. (2008) study based on the data from the tenofovir HIV Prevention trial in Ghana, where 400 women were enrolled over a six-month period, explored concerns of risk compensation among the trial participants. The study featured both a quantitative and qualitative method of collecting data. A structured questionnaire was given to the respondents at enrolment and at all the monthly visits. "The primary 2 risk outcomes from this questionnaire that were used for this analysis were the number of different male sexual partners they had in the past 30 days and the proportion of unprotected coital acts in the past 7 days" (Guest, et al., 2008: 1003). The qualitative aspect of the study involved a sample of 24 women who were interviewed; six women were randomly selected for each of the six months of the study.

A small increase in unprotected sexual encounters was reported at the 2-, 3- and 5-month marks, however as the study continued, the reported unprotected sexual encounters decreased. Most of the respondents stated that the counselling offered during the trial aided their understanding of risk behaviour and led them to make better choices, making them use protective measures. This part of the prevention package steered the women in a positive direction (Guest, et al., 2008). An important factor was the accessibility and availability of condoms. A decrease in the number of sexual partners was also attributed to the counselling, as these sessions provided knowledge which enabled the women to gain an increased HIV risk perception. According to the authors, risk behaviour decreased during the trial. Therefore, the conclusion from the study is that there is no correlation between PrEP and risk behaviour.

A longitudinal study of the data from the Partners PrEP Study (the Partners PrEP study was located at nine research sites in Kenya and Uganda) was performed, using regression analysis (Mugwanya, et al., 2013). It compared whether the awareness of the efficacy of pre-exposure prophylaxis for HIV prevention initiated an increase in risky sexual behaviour. The occurrence of unprotected sex during the 12 months after was compared with the 12 months before July 2011. The criteria to observe risk behaviour considered four measures of sexual activity:

Frequency of sex (vaginal or anal) without a condom (unprotected sex acts); frequency of sex with or without a condom (total sex acts), with both their HIV-infected primary study partner (i.e., the partner with whom each patient enrolled in the study), and outside partners (i.e., any additional partner other than the primary study partner,

including concurrent partners and partners acquired if the study partnership dissolved during follow-up) (Mugwanya, et al., 2013: 1022).

After examining the behaviour of the participants once they knew they were receiving a drug with confirmed efficacy against the acquisition of HIV to establish signs of risk compensation, the analysis of the data resulted in conclusion that there was no substantial association of changes in risky sexual behaviour “especially within a known HIV sero-discordant partnership” (Mugwanya, et al., 2013: 1026).

The study findings revealed that there was no evidence of risk compensation consistent with a few other HIV prevention method studies (Peterson, et al., 2007; Liu, et al., 2013; Grant, et al., 2014). Many of the participants tended to engage in safe sexual behaviour, evident in fewer HIV infections and syphilis cases. Respondents who believed they were administered the study drug (FTC/TDF) had higher receptive partners at the beginning of the trial, before getting the study drug, inferring that risky behaviour was not a result of receiving PrEP (Marcus, et al., 2013).

The authors suggested that social relations are a more significant factor of sexual decisions than individual assessment of perceived risks and benefits as hypothesised by the risk compensation theory (Marcus, et al., 2013).

An inquiry was carried out by Tripathi, et al. (2013) where self-administered surveys were given to seronegative partners from 2010 to 2011 in South Carolina, United States of America at an HIV/AIDS clinic. The authors sought to explore the behavioural and socio-demographic factors that may be concomitant with the adoption of pre-exposure prophylaxis among HIV seronegative MSM and heterosexual partners. According to the results, a little more than half of the participants (58%) reported regular use of condoms during sexual intercourse (vaginal or anal) once aware of their partner's HIV status and more than 70% used condoms during their last sexual encounter with their primary partner. Also observed, more than one-third of the participants (seronegative) did not take an HIV test which may be due to the perceived risk of HIV infection.

As expected, the majority of respondents believed that PrEP would give them more control over whether HIV infection was acquired; however, the high rate of inconsistent rate of condom use despite knowledge of HIV transmission risk in this population raises the question: Will availability of PrEP encourage further sexual disinhibition by providing a false sense of security against HIV infection? (Tripathi, et al., 2013: 562-563)

This study showed a correlation between using PrEP and a significant danger of risk compensation, especially among those who previously reported partaking in sexual risky behaviours. The authors recommend, continued sexual health education which involves both partners and which would help inform them of the proper use of PrEP and their behaviour thereafter (Tripathi, et al. 2013).

PROUD, a pilot study and an open-label randomized trial, enrolled HIV-negative gay and other men who identified as having sex (anal intercourse) with men without a condom in the preceding 90 days from baseline. It was conducted at 13 sexual health clinics in England (McCormack, et al., 2016). The study showed a higher protection against HIV infection than from previous placebo-controlled trials, dispelling worries that PrEP may be less effective in real-world settings. A short fall of this study was that it had insufficient data to examine risk compensation because of taking PrEP. “The absence of longitudinal data for sexual behaviour is frustrating, as we cannot assess precisely how participants matched adherence to risk, insights into risk compensation are limited to a single time point at 1 year” (McCormack, et al., 2016: 58).

PrEP as an HIV prevention option is still a relatively novel method and therefore limited knowledge is available on its effect on risk compensation. The literature reviewed in this section exhibits that more research still needs to be conducted to understand the relationship between risk perception, risk behaviour and individual characteristics outside a clinical trial context.

Conclusion

This chapter presented an overview of HIV and AIDS globally, regionally, and locally (South Africa). This chapter discussed the methods of HIV prevention in the past leading up to the development of VMMC and oral PrEP as new HIV prevention methods that have the potential to greatly reduce HIV prevalence.

The following chapter presents the theoretical frameworks that underpin the study. The study is informed by the Health Belief Model (HBM). Using the individual level of HBM can help the researcher understand individual perceptions of biomedical HIV prevention methods. The HBM is embedded in the Social Ecology Model for Health Behaviour (SEMCHB) which allows the researcher to consider the multiple factors that influence decision making. The study is also informed by the Risk Compensation Theory (RCT) which assists the researcher to understand how individuals perceive risk and the benefits of safe behaviour and how these are incorporated into their actions.

Chapter 3: Theoretical Framework

Introduction

A single theory cannot guide the understanding of the complexities involved in the process of decision-making and behavioural change. Therefore, the principles, models, and theory that this research employs to gain understanding into the study's conceptual framework are the Social Ecology Model of Communication and Health Behaviour (SEMCHB), the Health Belief Model (HBM), and Risk Compensation Theory (RCT).

The SEMCHB is an overarching framework to understand the interrelated personal and environmental factors in health and illness. The HBM is used to examine the individual level of the SEMCHB. The study further employs the HBM to illustrate how the model informed the inquiry into the concept of risk compensation among rural and peri-urban black men in their uptake of voluntary medical male circumcision and pre-exposure prophylaxis as HIV prevention methods. It also assessed the decision-making process before uptake of the biomedical interventions. The risk compensation theory or risk compensation homeostasis concepts will be used in this study to establish how individuals perceive risk and the benefits of safe behaviour and how this is realized in their actions.

Principal theories in this study

The principal theories that inform this study are the Health Belief Model (HBM), the Social Ecology Model of Communication and Health Behaviour (SEMCHB) and the Risk Compensation Theory (RCT) (Sallis, et al., 2008; Kincaid, et al., 2007). The HBM seeks to unpack the influences of specific groups accept preventative health services and why they do or do not adhere to other kinds of health care regimens (Rimer, 2008). In this study, the HBM assisted the researcher to understand why specific groups of men aged 18 – 39 years in Umlazi and Vulindlela, South Africa accepted or rejected VMMC and oral PrEP as HIV prevention interventions. Then the SEMCHB model seeks to explore the different levels at which individual behaviour change can happen. The RCT seeks to assist the researcher understand how specific groups of men take steps to reduce adverse effects of behaviour therefore enacting behaviour change. While HBM and RCT focus on behavioural change at the individual level, in keeping with this study, the SEMCHB acknowledges that contextual and structural factors influence behaviour change. Thus, the SEMCHB recognises that interpersonal relationships by society and the community in which an individual resides play a role in influencing behaviour change.

Health Belief Model (HBM)

The HBM was originally developed in the 1950s by social psychologists Hochbaum, Rosenstock and Kegels working in the United States Public Health Services (Glanz, Rimer & Lewis, 2002). The model was developed in reaction of the failure of free tuberculosis (TB) health screening program. The HBM framework has been revised several times to explore a range of long- and short-term health behaviours, including risk behaviours and the transmission of HIV/AIDS.

The HBM posits that an individuals' perceptions of a personal health behaviour threat is influenced by four key factors: perceived susceptibility; perceived seriousness; perceived benefits of taking action; and barriers to taking action (Hochbaum, et al., 1952; Glanz, Lewis & Rimer, 2002). When met with behaviour change initiatives, it is assumed that individuals will reason within these four critical spheres to determine the risks and benefits associated with the recommended behaviour's adoption (Janz & Becker, 1984). These four constructs were proposed to account for an individual's "readiness to act". Cues to action was later added to propose readiness to act and the stimulation of overt behaviour. The most recent addition to HBM is self-efficacy, one's belief in the ability to perform an action successfully and satisfactorily (Rosenstock, et al., 1988).

The HBM will be utilized in the context of this study to understand how different factors influence health behaviour. Below is an account of the constructs of the HBM.

Table 1. Key constructs of the Health Belief Model (Janz, Champion and Strecher, 2002)

CONCEPT	DEFINITION	APPLICATION
Perceived Susceptibility	One's opinion of chances of getting a condition.	Define population(s) at risk, risk levels; personalise risk based on a person's features or behaviour; heighten perceived susceptibility if too low.
Perceived Severity	One's opinion of how serious a condition is.	Specify consequences of the risk and the condition.
Perceived Benefits	One's opinion of the efficacy of the advised action to reduce risk or seriousness of impact.	Define action to take: how, where, when; clarify the positive effects to be expected.
Perceived Barriers	One's belief about tangible and psychological costs of the advised action.	Identify and reduce perceived barriers through reassurance, correction of misinformation, incentives, assistance.
Cues to action	Strategies to activate one's "readiness".	Provide how-to information, promote awareness, and employ reminder systems.
Self-efficacy	One's confidence in one's ability to take action.	Provide training, guidance in performing action; use progressive goal setting; demonstrate desired behaviours; and reduce anxiety.

Perceived susceptibility refers to an individual's "perception of the risk of getting a condition." Such a risk can often be perceived differently amongst a cumulative group of individuals (Janz & Becker, 1984: 2). Perceived susceptibility is identified as the most significant perceptual factor in encouraging individuals to embrace healthier behaviours (Glanz, Rimer & Lewis, 2002). For example, the men under study must believe that their chances of contracting HIV

are high for them to consider using the biomedical HIV preventative interventions available to them. Similarly, men who do not perceive themselves to be at risk of acquiring HIV will not use biomedical HIV preventative interventions. It is important to note that the adoption of health behaviour is also influenced by personal beliefs, where MMC and PrEP uptake are believed to be unnecessary, men are at risk of HIV infection. If perceived risk is low, unsafe behaviour is established and may result in the development of diseases or death (Hayden, 2009). A randomised controlled trial conducted in Kenya, South Africa and Tanzania for PrEP for HIV prevention showed no significant reduction in HIV acquisition and this was determined to be the result of low drug adherence from the study participants. The study hypothesized that “the women’s perception that they were at low risk for HIV prevention may have contributed to the poor adherence” (Van Damme, et al., 2012:420). A low perception to risk of HIV infection may result in individual’s rejection of recommended behaviour.

Perceived severity refers to the level of seriousness that an individual associates with a given threat (Hochbaum, 1958). This can include social consequences, such as stigma and loss of employment, that an individual feels will accompany the condition or medical consequences such as long-term illness or death (Janz and Becker, 1984). According to HBM, recognizing possible risk of a disease is a fundamental cognitive process in taking up healthy behaviour that helps in avoiding contracting a condition (Hayden, 2009). A low perceived severity by an individual may lead to an unlikelihood of uptake of preventative measures while an individual may likely take action if they believe that the social, psychological and physical effects of a condition pose serious repercussions such as loss of employment, pain, exclusion, death, altered relationships and disability (Champion & Skinner 2008; Mathew, 2012; Sakarombe, 2014).

The first two factors of HBM relate to the threat faced by an individual. The third and fourth factors relate to the intervention recommended to aid the individual to counteract this threat. The *perceived benefits of taking action* are the benefits an individual perceives they will receive in adopting certain health behaviours and these are crucial in the adoption of healthy behaviour. “These ‘benefits’ relate broadly to the individual’s opinions of the “value or usefulness” a new behaviour will be in decreasing the risk of acquiring a disease” (Sakarombe, 2014:62). For instance, what do men think are the benefits of using PrEP (Truvada) or undergoing the circumcision procedure?

Barriers to Taking Action refers to obstacles the individual perceives as barriers to adopting a new behaviour. These can include personal barriers such as pain, anxiety over treatment/procedures and physical obstacles such as expenses and inconvenience. These barriers may lead to no action by an individual, meaning a move away from recommended

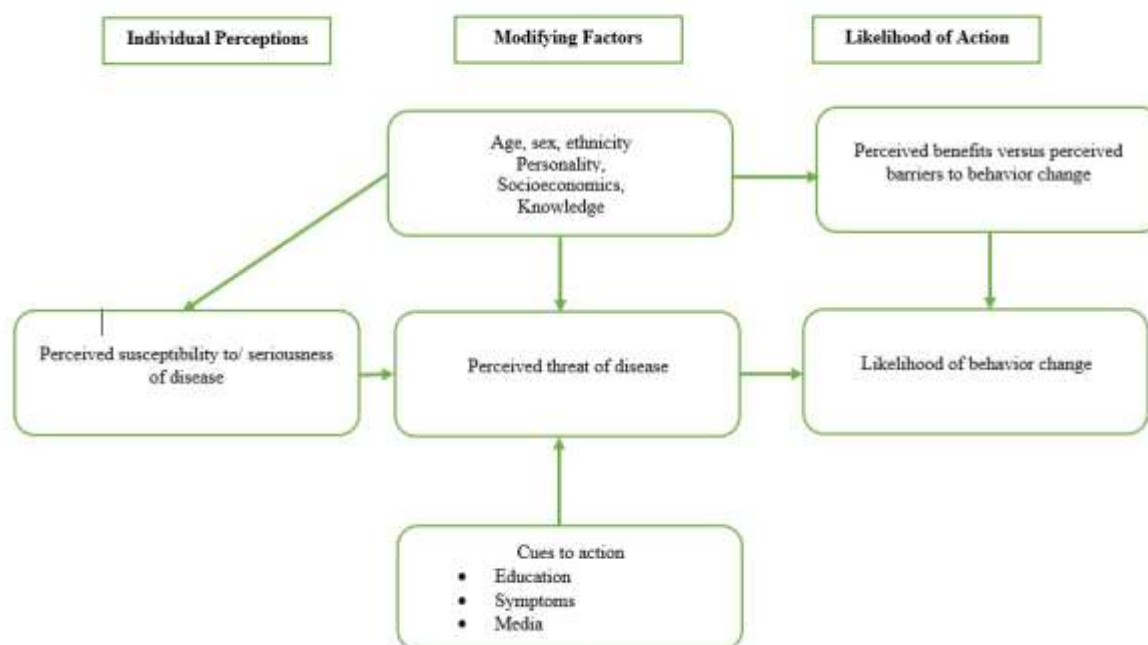
action (Hochbaum, et al., 1952). Through a process of cognitive appraisal of these factors, individuals assess the advantages and disadvantages ascribed to adoption or the rejection of the recommended behaviour (Mathew, 2012). Once the barriers have been eliminated; the perceived benefits provide the desired behaviour to occur. Pain, fear of infection, an inability to care for wounds post procedure, death during the circumcision procedure and discrimination are a few of the barrier men have identified to VMMC adoption (Adams & Moyer, 2015; Moyo, et al., 2015; Hoffman, et al., 2015; Bailey, et al., 2008; Mathew, 2012). HIV stigma and discrimination is one of the foremost barriers to adoption of many HIV prevention interventions as individuals are afraid of taking an HIV test to know their status (Moyo, et al., 2015).

Cues to action are defined as the motivations necessary to influence individuals to adopt new behaviours. “The cues to action represent the “internal or external prompts that create awareness and aid in facilitating action (Mattson, 1999:243; Mathew, 2012:48). Events such as an illness of a spouse or family member, communication strategies (media campaign) that advocates a certain intervention or behaviour, media reports, a warning label on a product, or advice from others (Hayden, 2009).

Self-efficacy is the final factor of the HBM and is derived from Albert Bandura’s Social Cognitive Theory (1977). Self-efficacy is the belief in one’s own ability to do something, meaningful whether one perceives themselves as capable enough to carry out the recommended course of action (Rosenstock, et al., 1988; Hayden, 2009). If an individual believes a new behaviour is useful (perceived benefit) but does not believe they are capable of doing it (perceived barrier), there is a chance of the individual not trying at all (Glanz, et al., 2002).

The HBM is not without criticism or its limitations. Some critics suggest that the HBM is individualistic in nature and does not account for other factors outside the individual effecting behavioural change (Airhihenbuwa & Obregon, 2006; Sakarombe, 2014).

Figure 2. Health Belief Model components and linkages (Glanz, Rimer & Lewis, 2002)



Applying the HBM to the current study

HBM states that the motivating factors for individuals to adopt a recommended health intervention are dependent on six concepts as discussed above. HBM theory is used as a guiding framework for this study as it aids in explaining and accounting for health beliefs, attitudes, and behaviour, thus helps frame the research questions. The primary aim for this research study is to explore risk compensation among men in the adoption of biomedical HIV preventative interventions and consequently explore the perceptions of VMMC and PrEP. As the study utilizes HBM concepts to understand how different elements influence health behaviour, below is an account of how each construct of the model has guided the study's questions.

Perceived susceptibility refers to an individual's own personal belief of their risk of HIV acquisition. The participants of the study would need to have a certain appreciation of their level of risk to HIV acquisition within their networks (social/personal and geographic) for the concept of susceptibility to be sufficiently questioned. By first questioning their perception of risk, the researcher can assess how seriously HIV is perceived by the individual therefore the *perceived severity* attributed to HIV.

An essential focus of the study is to assess how risk to HIV acquisition and in what way that influences health behaviour, thus assessing the participants' *perceived benefits*, or their

beliefs regarding “the value of usefulness”, of VMMC or PrEP (Truvada) in decreasing their risk to HIV (Hayden, 2009:33; Mathews, 2012; Sakarombe, 2014). This enables the researcher to evaluate the participant’s perception regarding the advantages of undergoing the circumcision procedure and using PrEP and assess how these perceptions may facilitate unsafe behaviour (risk compensation).

“Perceived barriers were the most powerful single predictor of the HBM dimensions across all studies and behaviours”, therefore, the study will seek to determine if there are any factors that are obstacles in the men’s willingness to uptake these biomedical HIV preventative interventions (Janz, Champion & Strecher, 2002:52). Personal barriers such as pain, risk of infection and even death; and physical barriers such as inconvenience and expense may hinder the adoption of new behaviour.

The cues to action concept of the HBM will be applied through discussion with the men, where the researcher seeks to understand the factors that contribute to their decision-making process and how that leads to action, if any, on adoption of the biomedical preventative interventions available.

Self-efficacy indicates an individual’s confidence in their ability to take action. In keeping with this study, self-efficacy would be the result of educating men about VMMC and how to use oral PrEP (taking a pill daily). Self-efficacy, in this case would be the direct result of the men feeling empowered to ensure their continued health and safety by using effective HIV prevention methods. Structural and socio-psychological factors may influence perceptions and indirectly influence health related behaviour. A major critique of the HBM is that it does not consider these factors.

Ecology of Models of Communication

Immediate factors for the spread of HIV relate to behaviour. This is covered by the HBM. The literature proposes that the basic influences that contribute to risky behaviour are in the social environment and include underdevelopment and poverty (Baxter and Abdool Karim, 2016). This section provides a background of Social Ecology Models and discusses the Social Ecology Model for Communication and Health Behaviour and its application to this study in order to recognise the context in which an individual lives in and that the HBM cannot be used on its own.

Background of Ecological Models

Over the years there has been a growing increase in the interest and application of ecological models in research and practice (Sallis, et al., 2008). Ecological models show exceptional

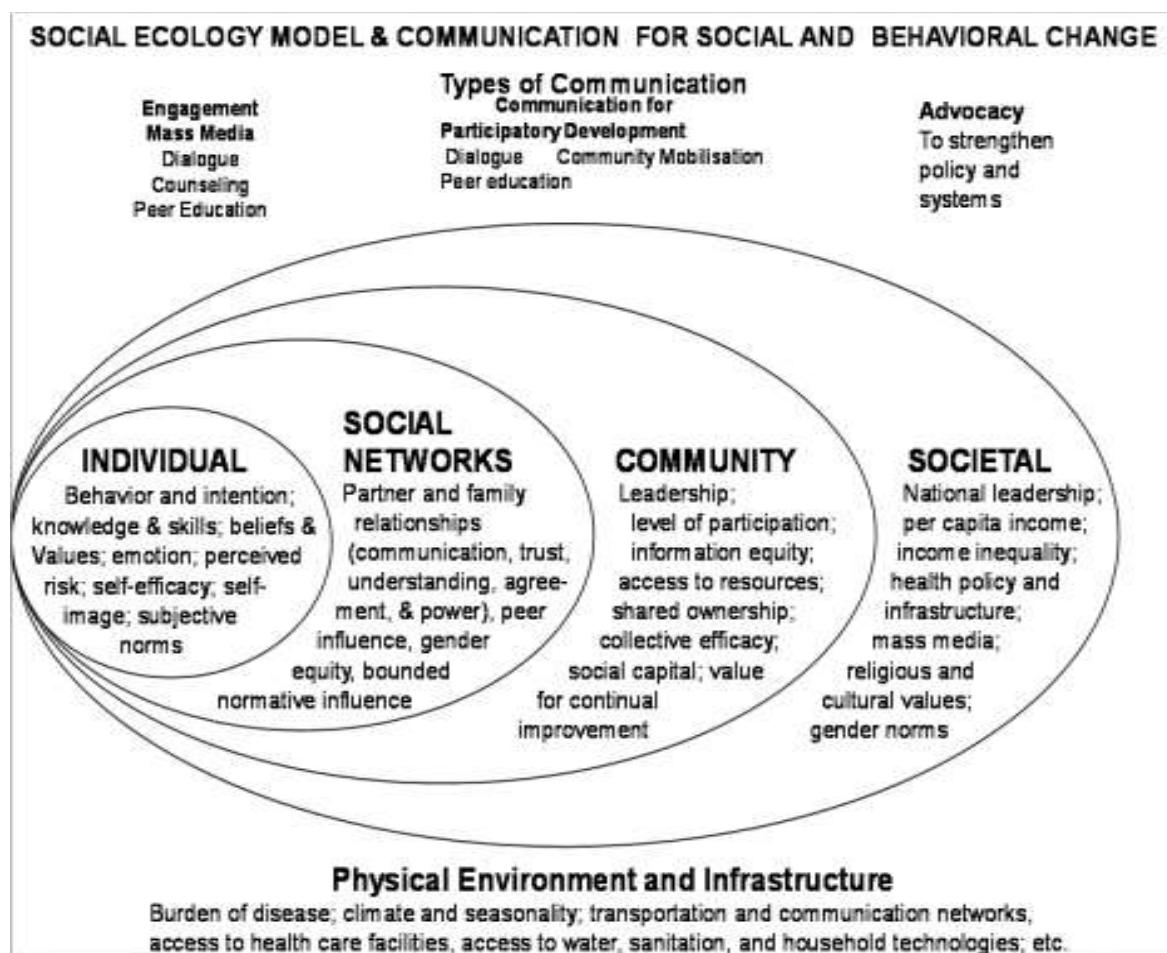
promise is guiding expansive population wide methods to changing behaviours that reduce common and serious health problems; HIV/AIDS being one such severe and prevalent health issue (Sidibe, et al., 2014; (Sallis, et al., 2008). Ecology refers to “interrelations between organisms and their environments” (Sallis, et al., 2008). Ecological models have evolved in public health and behavioural sciences and have come to represent people’s interactions with their socio-cultural and physical environments (Sallis, et al., 2008). The concept of ecological models is that behaviour can be influenced at different levels such as the interpersonal (social, cultural), intrapersonal (biological, psychological), community, organisational, society and policy levels (Sallis, et al., 2008). Thus, ecological models can integrate constructs from models that focus on social, organisational, and psychological levels of influence to provide a wide-ranging framework that incorporates various theories and further consider environments and policy in the wider community (Grzywacz and Fuqua, 2000).

The Social Ecology Model for Communication and Health Behaviour (SEMCHB)

The model represents “a metatheory of health communication that summarizes the contribution of a wide range of communication, social and behavioural change theories and their interrelationships” (Kincaid, et al., 2012, p. 307). It identifies a set of psychosocial variables grouped into three domains that have been shown to have a direct, often complementary and cumulative influence on health behavioural change. The three domains are (a) cognitive determinants of behaviour, such as attitudes and perceived norms about the recommended behaviour, perceived risk (of infection), and self-efficacy to protect oneself and/or others from the disease; (b) emotional determinants, such as feelings of fear, trust, and compassion (toward the ill and the recovered); and (c) social influence determinants, such as social support to practice the recommended behaviour or peer pressure to avoid it and interpersonal communication with others about recommended practices. Research has shown that the more of these elements that come into play in a given setting, the greater the likelihood of practicing a recommended behaviour (Babalola, 2007; Kincaid, Storey, Figueroa, & Underwood, 2006; Ricotta, et al., 2015). This study is interested in the interpersonal level of the SEMCHB. In the context of this study, this level informs the understanding of how interpersonal relationships, either with intimate partner, family and friends influence perceptions of VMMC and oral PrEP among men in Umlazi and Vulindlela, South Africa. This level assisted the researcher interrogate how perceptions of the community, partners, family, and peers influence the acceptability and uptake of VMMC and oral PrEP among men, based on the accounts of the men interviewed in the study. At the individual level of the model, interventions to promote health interventions focus on modifying an individual’s health-related beliefs, attitudes, and behaviour. This needs voluntary and sustained effort by the person

(Stokols, 1996). The HBM is applied at this level because it assists researchers ascertain why individual's perceptions are either against or in favour of change (McKee, et al., 2014).

Figure 3. The Social Ecology Model of Communication and Health Behaviour (Kincaid, et al., 2007)



Applying SEMCHB to the study

The study explores men's adoption of VMMC and PrEP as HIV preventative interventions, through understanding the key factors that influence men's decision-making process, in the choice of HIV preventative interventions they choose to use. Therefore, the focus of my inquiry rests at the individual and community levels of the SEMCHB. The study assessed how do individual factors (knowledge, beliefs, and perceptions) and physical environment (location and infrastructure) guide the decision-making process. The study explored the extent to which the interconnectedness of the levels influences the behaviour of the men and their decision-making process. Individual behaviour change without support through the social environment is inefficient in sustaining change (Govender, 2011). Understanding the society, people and environment around a man will assist in effecting permanent behaviour change.

All the levels are interconnected and the probability of sustained behaviour change rests in the support and facilitation of change at all levels. Storey & Figueroa (2012: 76) posited that

“the two key features of this model are the assumptions of *embeddedness*, a state in which one system is nested in a hierarchy of other systems at different levels of analysis, and *emergence*, in which the system at each level is greater than the sum of its parts” (Storey & Figueroa, 2012: 76).

This implies that if individual change is supported and maintained by social change at greater levels it has a greater chance of being self-sustained (Kincaid, et al., 2007). The Health Belief Model (HBM) will be utilized to help explore the *individual* level of the SEMCHB and the factors that influence an individual's behaviour.

Risk Compensation Theory

Risk compensation theory is a concept “of behavioural adaptation to compensate between perceived risk and desired risk” (Trimpop, 1996: 119). Peltzman (1975) used risk compensation theory to evaluate the effects of mandatory vehicle safety devices in the 1960s. His research concluded that safety regulation had no effect on the highway death toll (Vrolix, 2006). Wilde (1994) expanded on Peltzman's theory of risk compensation with a psychological model (risk homeostasis theory) to describe why safety interventions do not yield long-term decreases in death rates. The risk homeostasis theory posits:

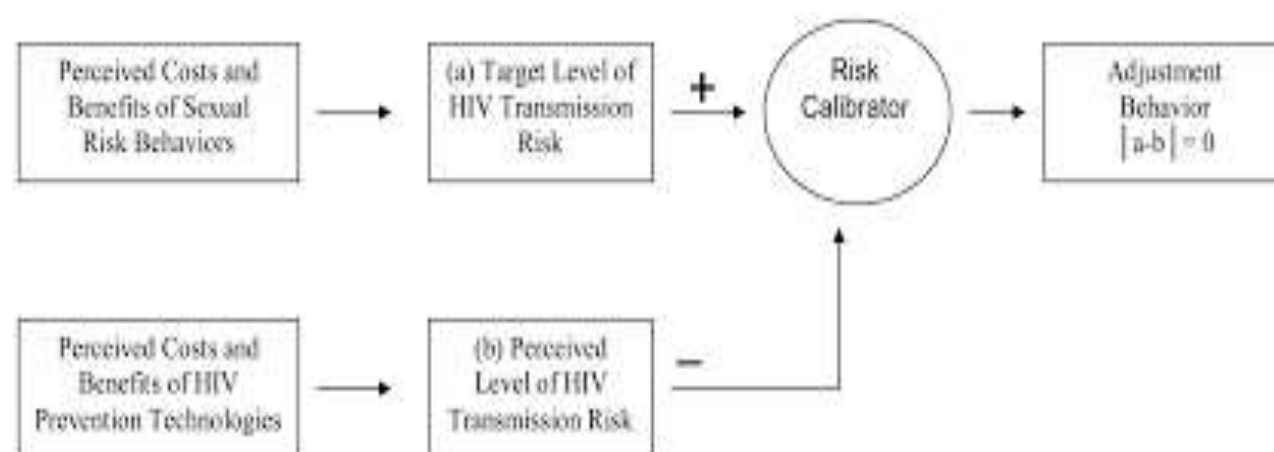
People alter their behaviour in response to the implementation of health and safety measures, but the riskiness of the way they behave will not change, unless those measures are capable of motivating people to alter the amount of risk, they are willing to incur (=target level of risk) (Wilde, 1994: 7).

According to Wilde (1998), there are different factors that influence the level of accepted risk such as; social, cultural and psychological factors. The amount of risk individuals are willing to take depends on four factors: (1) The expected benefits of risky behaviour alternatives (for example the perceived pleasure of unprotected sexual intercourse); (2) the expected costs of risky behaviour alternatives (for example the possibility of being infected with a sexually transmitted infection); (3) the expected benefits of safe behaviour alternatives (for example being HIV and STI free); (4) the expected costs of safe behaviour alternatives (for example being called names for becoming circumcised; discrimination based on HIV status) (Wilde, 1998: 89). To decrease the target level of risk, Wilde (1982) suggested increasing the incentives of safe behaviour and the consequences of risky behaviour. Meaning people should be made more aware of the negative consequences of risky behaviour and the benefits of safer choices.

The introduction of HIV prevention interventions may reduce the perceived risk, and this could result in an individual to increase risky behaviour (risk compensation) so that the difference between the levels of risk the individual takes, and the perceived risk rises (Blumenthal and Haubrich, 2014). For example, while taking PrEP, people may perceive that they are protected from acquiring or transmitting HIV. Thus, mitigating the possible benefits of antiretroviral based HIV prevention strategies.

To understand how individuals consider their perceived risk for HIV infection is crucial in approximating the impact of HIV prevention interventions for people. Figure 4 illustrates Wilde's model revised for HIV risk compensation (Eaton and Kalichman, 2007).

Figure 4: A model of risk compensation and sexual risk behaviour (Eaton & Kalichman, 2007)



Applying Risk Compensation Theory to the Study

PrEP is the use of an antiretroviral medication to prevent the acquisition of HIV infection by individuals who are HIV negative (WHO, 2014). A number of studies have demonstrated the efficacy of PrEP when administered as part of a comprehensive HIV prevention package and strict adherence to the program (Thigpen, et al., 2012; Van Damme, et al., 2012; Marrazzo, et al., 2015).

According to Wilde's (1982) model, the first step is to establish the level of risk a person is willing to accept for a negative consequence to determine the person's target set point. For example, HIV infection. Establishing the target set point, involves analysing the disadvantages and benefits of protective and risk behaviours. A comparative process between perceived risks and target level of risk that a person is willing to take occurs once the target set point is determined. A difference between the target set point of the amount of risk an individual is willing to take and their perceived real risk causes a change in behaviour to decrease the difference between what the individual is willing to take and their perceived real risk. Upholding

constancy in perceived level of risk that is consistent with that target set point of risk involves risk processing and a consistent behaviour regulation process (Wilde, 1994; Eaton and Kalichman, 2007). The core of this research is understanding the motivating factors that lead to behaviour change or rather the influences around men's decision-making process in the adoption (or lack thereof) of biomedical HIV preventative interventions. Employing RCT helps the researcher gain an understanding of how individuals perceive risk and the benefits of safe behaviour and how this is realized in their actions.

Conclusion

The purpose of this chapter was to present the theoretical framework that underpins the research. The SEMCHB is the overarching theory that guides the study and illustrates the interactions between different levels and how they facilitate the health behaviour change. The concepts/constructs of the Health Belief Model were reviewed and used in relation to the SEMCHB, and the Risk Compensation Theory discussed to help understand the perceptions of risk by individuals.

The reason the researcher selected the SEMCHB as the theory underpinning the study is that at the individual level the research can determine why individual's perception are in favour of changing behaviour or against. The embedding of the HBM in the SEMCHB allows the researcher to acknowledge that while there are multiple factors (including the community, society and social networks) influencing that specific health behaviour it is still needed to understand individual level factors. This is further influenced by the men's perception of their risk of infection and how change in behaviour to safer ways can benefit them. This is relevant to the study as the researcher seeks to understand the specific groupings of men who may be interested in VMMC and using oral PrEP as HIV prevention methods.

The next chapter will discuss the methodology adopted for the study.

Chapter 4: Methodology

Introduction

This chapter explains the methodology utilized to conduct this research. The study investigated the concept of risk compensation among rural and peri-urban black men in the uptake of two biomedical inventions: voluntary medical male circumcision and pre-exposure prophylaxis for HIV prevention. It assessed the decision-making process that influences or contributes to their choices and uptake of these interventions. The sample was drawn from men in Umlazi Township (peri-urban), located 24 kilometres South West of Central Durban and Vulindlela, a rural area located 150 kilometres west of Durban. This chapter discusses the research design, research population, the data collection methods used and the ethical considerations.

Research Paradigm

The research design is a plan/structure of investigation detailing how a researcher obtain answers to their research questions. The key research questions for this study are of a qualitative nature and would generate conversation (words) rather than numbers. Understanding how the individual's interpersonal and social attribute influenced the participants' decisions regarding their choice of HIV prevention options is the basis of this study. Thus, this research study is set within an interpretive paradigm.

A paradigm can be described as shared understandings of reality. It is view as worldviews which are "complete, complex ways of seeing and sets of assumptions about the world and actions within it" (Rossman, et al., 2003: 37).

The interpretivist approach is based on the assumption that people create meaning and relate their personal and subjective meanings as they connect with the world. According to Orlikowski & Baroudi (1991), interpretive researchers are meant to understand the meaning people assign to a phenomenon. This approach enables the researcher to make sense of the decision-making process of the participants through interpreting the meaning they have created towards HIV preventative methods.

Epistemologically, interpretivism is a framework positioned in qualitative approach. It sought the interpretations of the social world which are historically situated and derived from culture (Ormston, et al., 2014). According to interpretivism, reality and social reality are different and require different methods (Gray, 2013). The assumption made by interpretivists is that individuals cultivate multiple and varied meanings of their experiences that are subjective. This results in the researcher looking for complex views in place of confining meaning into a few ideas or categories (Creswell, 2013). Through interaction with others and through historical

and cultural settings, participants reproduce these subjective meanings. This study applies concepts from the Health Belief Model (HBM) to understand behavioural change at the individual level. It also uses concepts from the Social Ecology Model for Communication of Health Behaviour (SEMCHB). It acknowledged that contextual and structural factors influence behaviour change. Whilst concepts from the risk compensation theory (RCT) are used to understand how individuals perceive risk and the benefits of safe behaviour. Therefore, the interpersonal level of the SEMCHB observes that interpersonal relationships are influenced by the community as well as the culture and society in which the men reside. This is important as it shows that behaviour change can be influenced by a number of factors that are not within an individual's control (Flick 2014). In this case, it was important for the researcher to understand how the men of Umlazi and Vulindlela perceived their risk of HIV infection and how this can influence the uptake of VMMC services and oral PrEP. Generally, anti-retroviral drugs are used by people already infected with HIV to suppress their viral load. The researcher was aware that this association may lead to the men having negative perceptions of oral PrEP (Golub, 2018). At the time of data collection, which took place in the months of February and August 2017, the concept of oral PrEP was relatively new. The focus group discussions were used to elicit participants' views on the new biomedical approach to assess whether they had any knowledge of the product and if there would be interest in using the drug. VMMC as a preventative measure was well established, however there were concerns of low uptake in VMMC (HIV and AIDS in South Africa, 2021).

Research Design

Qualitative research can be defined as “a form of systematic empirical inquiry into meaning” (Shank, 2002:5). The research in question can be best described as a descriptive research design, which is ideal to examine the sort of questions social researchers are interested in asking, such as “why” and “what is going on?” (De Vaus, 2001: 1-2). A working definition of descriptive research design is “to describe systematically the facts and characteristics of a given population or area of interest, factually and accurately” (Isaac, 1971: 18). Undertaking such a research design encompasses an exploration of cultural and social phenomena, thus the nature of my research is solely qualitative.

The research was informed by qualitative methods as it is concerned with people's point of views of what occurs in their world and in understanding human experiences and the meaning that societies give to these experiences (Denzin & Lincoln, 2005). Qualitative research assists in the collecting of information about the ‘human’ side of a study, in particular, attitude, behaviour, opinions, perceptions beliefs and power relations. Qualitative research methods enable researchers to understand factors that are not quantifiable such as cultural values,

religion, gender and social status (Mack, et al., 2005). Qualitative research is an approach that is used to understand and explore the importance groups or individuals ascribe to a social or human problem (Creswell, 2013). Qualitative research produces descriptive data, people's own spoken or written words and observable behaviour (Taylor, et al., 2015). Hence, the qualitative approach proved ideal for this study because it allowed an understanding of perceptions informed by the experiences of men in Umlazi and Vulindlela, South Africa. The ultimate aim is to understand how men adjust their behaviour in response to perceived risk to HIV infection with either the adoption of VMMC or PrEP as HIV prevention methods. Qualitative research is able to generate elaborately nuanced personal data. This can be achieved by selecting knowledgeable participants, open-ended questions about their experiences and questioning their attitudes and inductive investigation of their replies (Namey and Trotter II, 2015). Men shared their experiences of current HIV prevention methods as well as how these experiences have shaped their perceptions of VMMC and oral PrEP. The researcher was able to investigate vies of potential users of oral PrEP and VMMC services and understand key influences that would most likely affect the acceptance or rejection of these HIV prevention methods.

There are a number of analytical approaches for qualitative methods; ethnography, qualitative comparative analysis, conversation analysis, narrative analysis and grounded theory (Patton, 1999). In this study the researcher adopted comparative analysis in understanding and interpreting the perceptions of urban and rural participants on their choices and decisions thereafter. The review of the focus group discussion transcripts provided the basis for interpretive and critical analysis of the study.

Setting

This study is located in Umlazi and Vulindlela in KwaZulu-Natal. The province of KwaZulu-Natal reportedly has the highest HIV prevalence in South Africa with 27% of people aged 15-49 years and 31.6% among women aged 20-24 years (Human Sciences Research Council, 2018; Shisana, et al., 2014). Conducting the study in this province provides the prospect of understanding the predictors of risky sexual behaviours among men. Subsequently the researcher conducted the study in two sites in KwaZulu-Natal, with males ages 18-39, in order to understand the factors that influences men's choices in choosing HIV preventative options and how they mitigate risk compensation.

Vulindlela is situated in the uMgungundlovu district situated 150km west of eThekweni (Durban), KwaZulu-Natal. It is a rural community with a population of over 250 000 people and has an HIV prevalence rate of 36.3% (Kharsany, et al., 2018). The community is at the epicentre of HIV epidemic in KwaZulu-Natal. This escalating epidemic led to an important

partnership between the traditional leaders in Vulindlela, the Department of Health KZN and the CAPRISA (Centre for the Aids Programme of Research in South Africa) Vulindlela research site (VRS) (CAPRISA, 2017). This partnership led to the establishment of the VRS, which is situated adjacent to the primary health clinic (Mafakhatini Clinic) and is run by CAPRISA. On this site, CAPRISA conducts clinical trials of new generation microbicides, carrying out studies which seek to understand the evolving HIV epidemic in South Africa and provide a comprehensive HIV/AIDS care package for people living with HIV/AIDS in the community (CAPRISA, 2017). Consequently, the effect of the HIV epidemic on the community of Vulindlela makes it important to develop interventions that will protect them from HIV infection, while also addressing the political, social, and economic factors that create vulnerability and perpetuate risk (CAPRISA, 2017; Ndzinisa, 2017). The Vulindlela community has witnessed the devastating effects of HIV and have collaborated with the government and CAPRISA to reverse the adverse effects of the epidemic in their community. Therefore, any research carried out in Vulindlela has both local and global impact.

EThekweni is a metropolitan district comprising of 103 wards that are urban, rural and peri urban. The area covers Umkomaas in the south and includes tribal areas in Umbumbulu to Tongaat in the north and tribal areas in Ndwedwe. The metro is highly urbanised and densely populated with pockets of rural communities on the outskirts to the north, south and west impacting on access to services. Umlazi township falls under the South sub-district, and is located 24 kilometres south-west of eThekweni, Umlazi is the fourth largest township in South Africa, with an estimated population of 404 811 people. The population may be underrepresented as there are large proportions of informal settlements dwellers that may not have been counted (EThekweni District Health Plan 2015/16; Census, 2011). According to the eThekweni District Health Plan 2015/16, Umlazi falls under the sub-districts with high HIV prevalence rates including Greater Inanda/Tongaat and South sub-district (Pinetown and Hlengisizwe).

The burden of disease in Umlazi has led to many different preventative programmes to invest resources in helping the community of Umlazi to curb the effects of HIV infection. Stepping Stones were developed as an HIV prevention programme. This is a life skills training intervention that has been created as a series of workshops sharing tools to help with the promotion of sexual health, improve psychological well-being and prevent HIV. The workshops address questions of gender violence, gender, sexuality, HIV/AIDS, communication, and relationship skills. Participants of the programme are able to recognise that their sexual lives are rooted in a broader context of their relationships with their families, partners and the community, and society in which they live in (SAMRC, 2010). The Stepping Stones programme was initiated through DramAidE in Umlazi. The programme is part of the HIV

prevention programmes that seek to help communities build their knowledge on aspects of sexual health and HIV/AIDS and to develop skills to aid them communicate their needs and wants to others whilst also examining their values and attitudes towards gender and relationships. It is important that while offering treatment for HIV care and preventative options such as condoms; social issues are addressed within the community.

The findings of several trials have proven the benefits for the use of both medical male circumcision and pre-exposure prophylaxis (Baeten, et al., 2012; McCormack, et al., 2016; Grant, et al., 2010; Molina, et al., 2015; Thigpen, et al., 2012; Auvert, et al., 2005; Bailey, et al., 2007., Gray, et al., 2007; Mehta, et al., 2013) for the prevention of HIV infection. However, as more HIV prevention products emerge, a need for in-depth understanding of the factors that influence acceptance and use of the products becomes vital. To understand the acceptability of VMMC and PrEP, men were selected from peri-urban and rural locations with varying age groups and social status. Understanding men's perceptions from various geo-spatial location are very important as the acceptability of HIV prevention products can differ according to location (Govender, et al., 2017). A recent study found that women from different geo-spatial locations were influenced by different factors when it came to using and acceptability of a microbicide gel (Govender, et al., 2017). The findings of the study illustrated a distinct urban-rural disparity on the acceptability of HIV prevention technology.

According to the study (Govender, 2017) women in the different locations have different sexual behavioural patterns and HIV prevention preferences, understanding the case of men in relations to product choices and decision making for HIV prevention is therefore an important area of research this study wishes to address.

Sampling and Recruitment

Selection of participants

The purpose of selecting participants in qualitative research is to develop our understanding of a larger relationship or social scene (Neuman, 2014). Participants were purposively selected to suit this study. Purposive sampling is a type of non-probability sampling, in which participants are chosen for a specific purpose. This sampling is most useful when research needs to explore a certain facet of life with knowledgeable experts within a particular field (Etikan, et al., 2016; Payls, 2008). Participants that are purposively sampled are deemed key informants. These are observant and reflective members of the community of interest who know about their culture and are willing and able to share their knowledge (Ndzinisa, 2017; Robinson, 2014). In qualitative research, participants are selected to provide understanding and awareness about issues or relationships in the social world (Neuman, 2014). Therefore,

the researcher purposefully selected men for this study. Men had to be between the ages of 18 – 39 years and live in either Umlazi or Vulindlela to participate in this study. The CAPRISA (Centre for the Aids Programme of Research in South Africa) Vulindlela research site (VRS) focus group discussion (FGD) Community Outreach Programme in Vulindlela (COMOSAT) is a community outreach organisation that has ongoing activities within the Vulindlela community which provided the researcher with access to participants. COMOSAT and Drama in AIDS Education (DramAidE) acted as gatekeepers facilitating access to participants in Vulindlela and Umlazi.

COMOSAT having links within the community assisted the researcher with recruiting study participants who met the study criteria and recruited them to participate in the study after they showed interest. Similarly, with DramAidE, men who were participating in the Stepping Stones programme were approached and those who showed interest in participating in the study were recruited. This sample is important as research shows that men living with HIV aged 25 – 40 years are infecting younger women (aged between 15 – 25) (de Oliveira, et al., 2016; Naicker, et al., 2015). However, most men are infected by women aged 25 – 40 years, this group has the highest HIV prevalence in South Africa.

Given the locations of the study, participants were African males, and are isiZulu speakers. The first focus group was held in Umlazi and there was a good response to participate in the study. We had twelve men come on the day of the focus group discussion (FGD), however, only ten participated as I required participants to stay for an hour and the other two had to leave during the FGD, therefore they were excluded from being part of the discussion. The second FGD in Umlazi had only ten men and in total there were twenty men recruited in Umlazi to be involved in the study. In Vulindlela, there were twenty men recruited to be part of the FGDs which were divided into groups of ten according to their ages; one group being 18 – 30 and the other comprised of men 31 – 39 years old.

Inclusion criteria and justification

To be included in the study, the men had to be between 18 and 39 years old, and resident in Umlazi or Vulindlela. The perspectives of this sample population were important because research shows that men aged 25 – 40 are more likely to engage in sexual relationships with younger women hereby contributing to the high HIV infection rates in the young women 15 – 25 (Baxter and Abdool Karim, 2016, Zuma, et al., 2016). Men 18 – 25 years are important as they also are in relationships with women 15 – 25 years and thus if they become infected the cycle of HIV infection continues (Tanser, Bärnighausen, Dobra and Sartorius, 2017). Therefore, it is important to access their knowledge and perceptions of VMMC and oral PrEP because this has an impact on whether they are likely to accept or reject these options as HIV

preventative methods. Knowledge of HIV status was not a primary question because the study explores men's perceptions of their HIV risk, VMMC and oral PrEP. While oral PrEP is a women-centred HIV prevention method, it is important that men are included in the discourse, hence the study's focus on them as a sample.

Recruitment

A researcher needs to negotiate access to participants in order to collect data. Researchers usually are able to negotiate access through a community insider (Ndzinisa, 2017; Harding, 2013). The insider is often referred to as a gatekeeper. Gatekeepers are organisations or individuals that can provide access to people being studied (Creswell and Poth, 2017). The location of the study in Umlazi allowed the researcher to use an existing relationship between Drama in AIDS Education (DramAidE), an organisation that is an educational/research non-profit organisation which "facilitate critical awareness and transfer of skills among under resourced communities of KwaZulu-Natal"⁷ and the community. DramAidE has on ongoing activities in Umlazi and as such, served as the insider through which access to participants were negotiated.

The organization was instrumental in gaining access to participants through their existing Stepping Stones programme. It was important for the researcher to be introduced to the community and to participants by an organisation such as DramAidE because they have established and maintained a good relationship with the residents through community engagement. Being introduced by a respected organisation or member of the community strengthens a researchers' capacity to work in the community and helps to improve the quality of data (Ndzinisa, 2017; Harding, 2013). This was particularly important for this study due to the sensitivity of the topic and the researcher's little knowledge of the area.

In Vulindlela the researcher used the existing relationship between CAPRISA and the Community Outreach Programme in Vulindlela (COMOSAT). CAPRISA is a UNAIDS Collaboration Centre for HIV Prevention Research affiliated with the University of KwaZulu-Natal. CAPRISA runs a prevention and epidemiology programme in Vulindlela with partners such as KZN Department of Health and COMOSAT. COMOSAT is a community outreach organisation with ongoing activities in Vulindlela and was able to provide gatekeeper access to negotiate access to participants. COMOSAT's link with CAPRISA was useful for the researcher because the researcher does not reside in Vulindlela and had no knowledge of local community. COMOSAT facilitated access to the men who participated in the study and

⁷ <http://www.unizulu.ac.za/outreach-centres/dramaide/>

the use of the community hall to conduct the focus group discussions. The organisation also provided a central place for the men to meet that was familiar and easily accessible.

Data Collection

Data collection was dependent on four focus group sessions. Focus groups are prearranged discussions with a number of participants. They are facilitated by a researcher with the aim of gathering in-depth views and opinions about a research topic. A focus group is a type of group interview that exploits communication between research participants to be able to generate data (Kitzinger, 1995). This is a type of open-ended interview through which data is collected through the interaction of a group of people on topics determined by the researcher (Morgan, 1996). Methodical questioning of several people in informal or formal settings (Fontana and Frey, 2000). Focus groups are a qualitative method of data collection as they explore participants' attributes, attitudes and opinions (Fern, 1982). This aids researcher in generating 'rich' data by supporting recollection in participants. Supporting recollection occurs because participants explain and question one another within the discussion (Morgan, 1996).

The moderator or researcher (the researcher can select someone else to moderate) guide the interaction and discussion in a structured or unstructured manner. This depends on the purpose of the interview (Fontana and Frey, 2000). In the focus group discussions conducted for this study, the researcher was the moderator and took notes. The moderator's methodology, skills and personality are critical in promoting group interaction; they should be a good listener, objective, empathetic, persuasive, and flexible (Fern, 1982). Moderators should also have a real interest in the people, be compassionate and have character (Stewart and Shamdasani, 2014). Having a moderator is important because if not monitored, participants can turn a focus group into a debate or use it as group therapy (Morgan, 1996).

The researcher, as the moderator, needs to be able to keep the discussions focused on relevant topics that will assist in the generation of rich data and encourage nervous and introverted members of the group to participate.

Focus group size and composition

The number of participants in a focus group is an important factor, however, researchers have not agreed on the ideal size of a focus group (Hopkins, 2007). Some researchers propose that a focus group can be comprised of as little as five participants to as many as 20 participants. Though, to be able to properly manage a group, a focus group should have 10 or less participants (Krueger and Casey, 2014; Morgan, 1996). In this study, the four focus groups ranged between 10 -12 participants in each group. These were participants who met the research inclusion criteria, interested in partaking, and consented to being part of the study.

Group dynamics are important in a focus group, this is influenced by the composition of the focus group. Researchers suggest that members of a focus group should not know each other nor be identical in terms of the relevant selection criteria (Tonkiss and Seale, 2004). Having participants that do not know each other is advantageous in a focus group discussion that focuses on sensitive topics such as HIV related issues because some may be hesitant to share information (Hopkins, 2007).

The selection criteria for this study did not include participants knowing each other, however they did have to share similar traits such as being male, in a certain age group, live in either Umlazi or Vulindlela. Knowing each other was not a disadvantage in this study because the researcher's questioning did not require any participant to disclose their HIV status or any other sensitive information that they may have been unwilling to share, the researcher was interested in participants understanding of HIV biomedical prevention methods and their perception of oral PrEP.

The researcher conducted four (4) focus group discussions with men who are between the ages of 18 - 39 years with ten participants in each group, there were 40 participants involved in the study. The groups were separated by age, one group with 18 – 30-year-olds and the second group 30 -39 year olds. Confining the focus groups to participants of a similar age group and same sex assisted in ensuring that there was no element of hierarchy between individuals. An element of hierarchy between individuals could inhibit the other participants and compromise the quality of data (Harding, 2013). Black African males aged 25-49 years have a HIV prevalence rate of 25.7% which is above the national average and are likely to engage in age disparate or intergenerational relationships with younger females (Shisana, et al., 2014; Dellar, et al., 2015). According to de Oliveira et al (2016) men between the ages of 25 – 40 years are the prime source of HIV transmission in young women and adolescent girls (15 – 25 years). Two focus group discussions were conducted at each site.

Sensitivity is a subjective construct because we do not all feel the same. What some may deem sensitive, others may not see as sensitive (de Oliveira, 2011). Matters concerning sexuality are commonly deemed 'sensitive' topics. Sensitivity is ultimately constructed according to the norms of a given culture; "Power and gender relations, the question of sexual identity, the social and cultural norms that organize sexual behaviour, race, religion, age, etc. are all social determinants of the 'sensitivity' of talk on sexuality" (de Oliveira, 2011: 3095).

The participation in a discussion about beliefs and attitudes towards sexual intercourse, circumcision and risk-related issues involves divulging intimate information. This may make the group environment seem not ideal for inquiries entailing very personal information, but it has been reported to work in environments where the participants are familiar with each other

(de Oliveira, 2011). The researcher attended one group session with both groups of the Umlazi participants before the FGDs took place, this was to become acquainted with the men and gain some rapport with the men to make them comfortable to discuss the sensitive topic of the study. The researcher was unable to have the same approach in Vulindlela and enlisted the help of a male assistant to conduct the FGDs. The men in both Umlazi and Vulindlela seemed comfortable with the researcher and spoke freely and openly.

The first FGD comprised ten participants with varying ages between 18 and 30 years old, this was held in Umlazi. The first FGD consisted of ten 18–30-year-old males and was conducted in an open space, near the soccer field the participants usually had their soccer practice. This location was suggested by the participants as it was the most central place for them and close for most of the participants to walk to. In the beginning, the researcher was apprehensive about the setting, but later realised that conducting the FGD in any other place would be an inconvenience for the participants and that they felt more comfortable in their surroundings. Even though this was an outdoor area, the participants sat in a circle which enabled them to talk freely, since this was their usual meeting place.

The second FGD was also held a couple of weeks later, in Umlazi with men aged 31–39 years. There were ten participants present and the discussion took place in an open space (outside one of the participant's residence). The participants chose the location, as it was central to them. The participants were seated in a circle and spoke freely. The participants of the focus group shared freely and were comfortable with discussing the issues at hand with the researcher. They expressed a keen interest to participate from the beginning until the end of the session, the FGD last an hour.

A community hall in Vulindlela was the location of the last two focus groups discussions. These focus group discussions occurred in August 2017, a few months after the initial FGDs in Umlazi as finding participants was initially difficult. The FGDs in Vulindlela were held on the same day, starting with the 18–30 age group, which was followed by the 31–39 age group. The conversation with the first FGD (ages 18–30) was slow at first. The participants were also shy to answer some questions posed to them. As the session continued, the participants began engaged and shared their ideas, opinions, and views freely.

Later during the day, the researcher conducted her final FGD with men aged 31 – 39 years in Vulindlela. The men in this group were open and willing to participate, they were comfortable discussing the issues raised and posed questions to one another. This sometimes veered the discussion away from the focus of the discussion. The researcher allowed some of these discussions to continue as they provided insight into the group and the topic under discussion. The FGD comprised of 10 men and the discussion lasted one hour and ten minutes.

The researcher was careful to try avoiding 'group think' in the focus groups discussions. Group think occurs when participants agree with views and opinions expressed by a more vocal participant, even though they may not necessarily agree with that participant. In this study, this was achieved by asking eliciting answers/discussion from most of the participants even the shy and more introverted participants. After each discussion the researcher went around and asked those who had not commented to share their views. This helped ensure that all participants had a chance to share their individual views, not influenced by fellow participants.

Data Recording

Collected data needs to be managed properly for optimal analysis (Miles, et al., 2013). In this study, all focus group discussions were recorded with an audio recorder and a cellular phone for back up. Field notes were used to document the focus group discussions for data transcription and analysis. The data collected was transcribed to enable the researcher to identify key themes emerging from the data after reading of the transcripts.

Data Analysis

In qualitative research, data analysis is an ongoing process that involves continuous reflection about the data, writing notes and asking analytical questions throughout the study (Creswell, 2013). Therefore, data collection occurs concurrently with gathering and interpreting the data. Data analysis began while all the focus group discussions were taking place. The researcher listened to the men taking part in the focus group discussion, picked up other non-verbal cues and watched their body language, this becomes useful in helping the researcher understand how the participants felt about particular points made during the discussions even if those were not expressed verbally.

The study comprised of multiple focus groups and the data was analysed using thematic analysis. The data from the focus group discussions were analysed one group at a time enabling the researcher to assess the meaningfulness of the emerging themes and to refine them as the process continues (Charmaz, 2000; Onwuegbuzie, et al., 2009). Thus, the researcher used the multiple sessions to identify whether themes that developed from one group also developed from the other groups.

Data was analysed thematically, guided by the constructs of HBM, SEMCHB and the risk compensation theory. Thematic analysis was used to develop themes that emerged under the constructs of these conceptual frameworks. Thematic analysis is defined as a method for classifying, analysing, and reporting patterns within data (Braun and Clarke, 2013). Thematic analysis interprets various aspects of the research topic whilst organising and describing data in rich detail (Braun and Clarke, 2013). Through thorough reading of the data, emerging

themes can be identified and categorised. An identified theme should capture something important about the data, which is related to the research questions (Braun & Clarke, 2006). The researcher needs to have a profound understanding of their research subject and the data collected, in order to elicit significant themes from the data. Qualitative researchers analyse data by organising it into categories based on themes, similar features, or concepts (Neuman, 2014). Therefore, themes followed the constructs of the three conceptual frameworks on which this study rests, the HBM, SEMCHB and risk compensation theory. Thus, data from the focus group discussions was used to develop themes.

This study interpreted and analysed the data using thematic analysis, to identify, analyse and document patterns within the data. This process was guided by the phases of thematic analyses proposed by Braun & Clarke (2006). There are six steps that guide the analysis process:

- (i) Familiarizing yourself with your data – *Transcribe data, reading and re-reading the data, noting down initial ideas.*
- (ii) Generating initial code – *Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.*
- (iii) Searching for themes – *Collating codes into potential themes, gathering all data relevant to each potential theme.*
- (iv) Reviewing themes – *Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic ‘map’ of the analysis.*
- (v) Defining and naming themes – *Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells; generating clear definitions and names for each theme.*
- (vi) Producing the report – *the final step; selection of vivid, compelling extract examples, final analysis of selected extracts, relating back to the research question and literature, producing a scholarly report of the analysis.*

(Braun and Clarke, 2006: 87)

Coding and analysis of the data was guided by the Health Belief Model (HBM) and the Social Ecology Model of Communication and Health Behaviour (SEMCHB) in order to better understand the decision-making process of men in their choice of HIV preventative methods and how they adhere to risk compensation concerns.

Validity and Reliability

In qualitative research, the concept of validity is a challenge as often the interests of the researcher are geared towards authenticity and the many truths in the collected data. In qualitative research there is no single truth, as it is embedded in the study of people's perceptions, reality within their social contexts. However, validity is an important aspect of research even within the confines of qualitative research as it confirms "truthfulness" within that research study. Validity in research is obtained through using research methods that have been used and tested before; and proven to be effective (Biggam, 2008). In the context of this study, validity is ensured by providing deep descriptive data.

Reliability refers to the concept that given the same data, environment, and participants; different researchers would reproduce the same assertions (Kirk & Miller, 1986).

According to Morgan & Drury (2003: 6):

This can be achieved by explaining the methodological framework and the range of strategies that have been used within the study. The rationale for the way in which participants were selected to take part should also be described, as should the researcher's role and their perceived relationship to those participants. It will be necessary to document analytic, constructs and meanings, which derive from data, alongside the methodological approach and procedures that were used for producing data.

This study covers the theoretical and methodological pathways coached in the above description, the research has enforced potential replicability and therefore reliability.

Ethical considerations

Addressing ethical issues within qualitative research strives to recognise the measures taken to protect the wellbeing of the participants (Ord, et al. 2000). It is the duty of the researcher to ensure that participants are protected from any type of harm that could occur. Harm to participants can happen in different aspects while partaking in research, and these may not be obvious to the participants and researcher alike, yet this could have far-reaching concerns. The study required the participants to be open and willing to be part of the discussion, engaging in topics relating to HIV preventative options, sexual encounters and the state of HIV/AIDS within their social environment.

For this study, ethical consideration was important. Before obtaining ethics approval the researcher underwent a process of presenting the research proposal before a panel of Professors, Doctors and peers within the same discipline. After the presentation the

researcher refined the research proposal until it was suitable for submission to obtain ethical clearance. Ethical clearance was obtained from the UKZN Humanities & Social Sciences Research Ethics Committee, ethical clearance was granted under protocol reference number HSS/1104/016M.

Participants of the study were presented with a clearly articulated consent form that explained the purpose, requirements, and the confidential nature of the study, in isiZulu and English – according to their preference. The consent forms were detailed and clearly stated that individuals did not have to partake in the study if they had reservations. However, if they chose to participate, they could at any point rescind their participation. The consent forms reiterated the voluntary nature of my investigation and participants were made cognisant that they were not forced to answer any questions they were not comfortable with or divulge any information they perceived as private and sensitive.

Participants were made aware that their names would remain hidden by means of a pseudonym if they so wished. It was also explained that there would be no manner of compensation for choosing to participate in the study, and that the discussions would be audio recorded.

Limitations

The limitations of the study worth mentioning relate largely to a few areas of the research. Firstly, the study relates to the sensitive and personal nature of medical male circumcision and HIV preventative interventions. The gender of the researcher and the way this may have affected the data collection process. The researcher was female dealing with issues affecting men. Some participants may have felt uncomfortable with discussing such issues with a young woman and may have deliberately left out information. There were some men who agreed to participate then did not engage once the discussion was underway. This indicated they may have been uncomfortable, despite reassurances from the researcher that the study would follow the highest ethical standards in handling data, and in particular their confidentiality.

The limited number of participants involved in this study, the findings and conclusions drawn through the study are not necessarily generalisable. These are not a true reflect of the general population but are an indication into the concerns motivating the research questions.

Chapter 5: Research Findings

Introduction

The purpose of qualitative inquiry is to present findings (Ndzinisa, 2017; Merriam and Tisdell, 2015). Qualitative research centres on the way people understand and perceive the world around them (Holloway and Galvin, 2016). This study seeks to understand how men in Umlazi and Vulindlela, South Africa perceive HIV risk and how these perceptions inform their acceptance of VMMC and oral PrEP as well as barriers and enablers that affect acceptability of these HIV biomedical prevention methods. Therefore, this chapter presents data around these concerns.

Qualitative research in its nature generates copious amounts of data (Miles, et al., 2013). Thus, a researcher needs to be able to analyse and present the data. The process of qualitative data analysis involves identification, exploration and the explanation of themes and patterns in the data, determining how the emerging themes answer the research questions (Ritchie, et al., 2013). In this study, data was generated from four research questions. The focus group discussions comprised of men from Umlazi aged 18 – 30 and 30 – 39; and men from Vulindlela aged 18 – 30 and 30 – 39. There was a total of 40 participants across all focus groups. This sample is relevant to the study because the HIV transmission cycle in South Africa indicates that men aged 25 – 35 are the group that infects the high-risk group of adolescent girls and young women aged 15 – 24, making them a key target for VMMC and PrEP services.

Findings are presented thematically, and the researcher was guided by the Health Belief Model (HBM), the Social Ecology Model for Communication and Health Behaviour (SEMCHB) and the Risk Compensation Theory (RCT) frameworks as the constructs of these models address the research questions. Therefore, the themes focused specifically on issues of perceived risk, perceived barriers, perceived susceptibility, perceived severity, perceived benefits, and cues to action. The SEMCHB was also used to understand the theme relating to social relationships' ability to influence the acceptability of HIV prevention interventions such as VMMC and oral PrEP. Thus, it was important to understand peer, family, and friends' perceptions and how these can influence men's acceptability and uptake of VMMC and oral PrEP.

Presentation of findings

The study findings are presented and discussed using the Health Belief Model (HBM), the Social Ecology Model for Communication and Health Behaviour (SEMCHB) and the Risk Compensation Theory (RCT) which are the conceptual frameworks of this study. Thematic

analysis allowed the researcher to apply analytical perspectives to the data that emerged through the categorisation of data into specific themes. While the study focuses on individuals, the context in which these individuals live is not ignored. This is why the HBM is embedded in the SEMCHB. The focus on individuals is important to this study because we need to understand the factors that influence and encourage acceptability and uptake of biomedical interventions and how we can make people more aware of the negative consequences of risky behaviour and the benefits of safer choices.

The five construct of the HBM were used to explore the participant's knowledge, awareness, and perceptions of the biomedical HIV prevention interventions, VMMC and oral PrEP. The constructs are perceived susceptibility to HIV infection, perceived severity to HIV, perceived barriers to uptake of VMMC and oral PrEP, perceived benefits of VMMC and oral PrEP and cues to action to encourage uptake. The study also employed the interpersonal level of the SEMCHB to understand the social factors that influence perceptions of VMMC and oral PrEP among men of Umlazi and Vulindlela, South Africa. The study further drew upon RCT to understand the participant's level of accepted risk. The four levels of risk for individuals according to RCT are the expected benefits of risky behaviour alternatives (such as the perceived pleasure of unprotected sexual intercourse); the expected cost of risky sexual behaviour alternative (such as the possibility of risk of infection of a sexually transmitted disease); the expected benefits of safe behaviour (for example being HIV negative); and the expected costs of safe behaviour (for example name calling because of being circumcised). RCT helped the researcher gain an understanding of how the awareness of negative consequences of risky sexual behaviour could led to safer choices. Therefore, we acknowledge that behaviour change may be an individual decision, and social relations have a significant influence on an individual's ability to execute a decision.

Presentation and analysis of findings

Perceptions of risk of HIV

Before a person can even consider HIV prevention measures, they must perceive themselves at risk of infection (Bandura, 1990; Rosenstock, Strecher & Becker, 1994). Participants' perceptions of risk have an influence on the acceptability of biomedical HIV prevention methods. It is important to explore perceptions of risk among participants to understand how their perception of risk affects men's individual interests and willingness to uptake VMMC and oral PrEP as HIV prevention methods. To understand the perception of risk of infection among the men who were the study participants, they were asked if they believed themselves to be at risk of HIV infection. It is important to establish if the men consider themselves at risk of HIV infection as this determines the level of risk they are willing to take.

Twenty-five of the men believe they were at risk of HIV infection and twelve believed they was no risk at all. One of the twelve men who believed there was no risk of infection was taking PrEP, two men revealed their HIV positive status, and one of the forty men did not feel comfortable in answering the direct question. One of the men believed his risk of infection was high as he does not use condoms during sexual intercourse. "Using a condom is very hard, sometimes you are in a rush and do not have time to put one on" (P31, Vulindlela, August 2017).

Perceived susceptibility and perceived severity

In this study, perceived severity refers to the participants' assessment of whether they believe they are risk of HIV infection, perceived severity indicates their assessment of how likely they are to be exposed to HIV infection.

Only ten men of the forty that participated in the study thought HIV was a grave threat to them and their community. More than half of the participants in Umlazi believed that having sex without a condom posed a great risk of infection. However, they were at low risk as they engaged in safe sex. This is different from the men in the focus groups in Vulindlela, as half of the men perceived themselves to be susceptible to HIV infection due to risky behaviour such as having multiple sexual partners, condom-less sex and engaging in sex while under the influence of alcohol.

Overall, one third of the men had a low perceived susceptibility to HIV infection and low severity to risk among the men. Meaning at least twelve men admitted to engaging in sexually risky behaviour.

Self-efficacy is the belief in one's own ability to exert control over their motivation and behaviour and over their social environment (Bandura, 1997). Therefore, the men were asked to assess their own behaviour and discuss whether this behaviour put them at a high risk or low risk of HIV infection.

Two men in the study reported that they did not know the actual number of sexual partners they had; they believed the number exceeded four women concurrently. Seven men in Umlazi (18 – 30 years old) admitted to engaging in risky behaviour as they each had more than 3 concurrent sexual partners. Many of the men also reported that they did not use condoms with their "main" partners. One of the men was aware that he engaged in risky sexual behaviour with his girlfriend; "Maybe you are with your girlfriend with whom you have been in a relationship for a long time, you now trust each other, and she perhaps sleeps with another man. When you become aware that she sleeps with someone else, you just tell yourself that

today I will go all out. And that is how you catch a disease. Really, it depends.” (P5, Umlazi, February 2017).

Overall, the data suggest that men engage in risky behaviour and are at high risk of infection.

Knowledge, beliefs, and attitudes

In this study knowledge, beliefs, and attitudes of infection of HIV, condom use and circumcision were discovered as issues relating to the acceptability and uptake of biomedical HIV intervention methods.

Knowledge and beliefs

The current study found that there were still misconceptions around HIV prevention and the sexual transmission of HIV. This was noted in both demographic groups and locations. Some of the participants were unsure of how to use condoms and did not understand the benefits of VMMC and PrEP.

Knowledge

Two men (in Umlazi) did not have a clear understanding as to how HIV infection occurs and how to prevent infection. Three men in Umlazi believed that having a bath or shower after sexual intercourse with an HIV positive person prevented one from possible infection. “It enters you if you haven’t washed on time and this thing will form” (P16, (38 years old) Umlazi, February 2017). The participant was explaining that after sex with an HIV positive person, one needs to rush and have a bath or shower to wash away the disease. Two other participants felt that although they had some understanding of how one becomes infected they did not feel confident with the information they had if they had to explain to someone else. “I personally understand but when we talk with each other as guys, many do not understand.” (P36, (35 years old) Vulindlela, August 2017). One of the men believed that there were many people within their community that did not know how to use condoms, “most people in our community do not have enough information about how to protect themselves from HIV and some do not know how to use a condom properly” (P7, (20 years old), Umlazi, February 2017).

Voluntary medical male circumcision has been available in South Africa for some years now, however, misconceptions of risk of infection of HIV once circumcision exist which includes the use of condoms after circumcision. Thirty-six of the men did not see the reason to use a condom after circumcising, it is worth noting that of the men involved in the four focus groups thirty had been circumcised. “Men that are circumcised, think that because they are circumcised they cannot get HIV” (P8, (22 years old) Umlazi, February 2017). “Why am I using

a condom when I am circumcised? Surely there is no need for a condom”, (P33, (29 years old) Vulindlela, August 2017).

Regarding the need for campaigns that cut across different demographics, seven men in Vulindlela stated that in the area they reside in, HIV prevention campaigns mostly targeted younger men and they thought more could be done for them as older men. Two men in Umlazi echoed the same sentiments.

Beliefs

South Africa has different cultural and religious beliefs and traditions. Circumcision is practiced both culturally and religiously by some segments of the South African population. The study explored different influence on men's uptake of biomedical HIV prevention measures. One participant who belongs to the Xhosa tribe believed that traditional circumcision is more important than medical circumcision as the practices involve more than cutting of the foreskin, “My culture grooms you, it's not just about cutting the foreskin, we are taught many things” (P15, (33 years old), Umlazi, February 2017). According to Xhosa culture and traditions, a man who does not go to the mountains to become circumcised is seen as a ‘boy’ as he has not been through the process that defines entry to manhood. This exposes a stigma attached to the uptake of medical circumcision in the Xhosa community, the likelihood that the uptake of VMMC may bring shame to oneself (Silimfe, 2017). In this instance culture influences a man's uptake of this biomedical preventative measure.

Two participants that are from the Zulu tribe state that circumcision is not traditional to their culture and they therefore do not wish to use the biomedical prevention method. “At home they say that this is a Xhosa thing only. This circumcision thing. Our grandfathers are here, and they never became circumcised. Why should we become circumcised? Surely this thing is only a Mpondo thing, it's not for us Zulu people” (P10, (21 years old) Umlazi, February 2017). “Circumcision came with people from the mountains (Xhosa) then Zulu people and White people saw what they were doing and thought that they should do it as well. We as Zulu people do not know why this is done, because they (Xhosa) do it to become men” (P22, (21 years old) Vulindlela, August 2017). Three participants from Vulindlela stated that King Shaka ended circumcision for the Zulu nation, therefore the older men in their community do not see a need to participate in VMMC as a biomedical prevention measure. “Older men do not fully understand male circumcision. It could be the fact that they have little knowledge on the subject, or it could be other things. We all know that older people have things that they believe in and this is not one of them” (P40, (38 years old), Vulindlela, August 2017).

In 2010, to aid the VMMC campaign the Zulu King, King Goodwill Zwelithini, pronounced his support of the practice of circumcision for Zulu people (The New Humanitarian, 2009; USAID,

2018). Within the Zulu culture, male circumcision has not been practiced for many generations. The tradition of male circumcision was ended 200 years ago by King Shaka. King Shaka believed the practice interfered with the training of his warriors, as they had to take time off to go into seclusion to partake in the ritual (Mills Wallace, n.d).

The consensus amongst the participants was that circumcision was culturally irrelevant to them, although the younger participants did identify that it could be beneficial to them medically, but some feared the backlash from their families. The evidence shows that Zulu men, particularly those from the older generation believe that circumcision has no benefit to them and should remain a Xhosa tradition. This is despite the Zulu King, announcing his support of VMMC.

Influences for uptake of biomedical prevention methods

There are factors that influence men's perception and uptake at the primary interpersonal level.

Family

Family members, especially women, emerged as being the most influential people that were involved in shaping the decision-making process by the men in whether to access biomedical HIV prevention methods or not. One participant reported that his grandmother convinced him to become circumcised; "My grandmother told me to go there, so I went" (P1 (20 years old), Umlazi, February 2017). Another stated it was a collective family decision; "My family members encouraged me to go and I knew what it was about. When I got to the hospital where I had gone to get circumcised, they then took us to another room and they told us why we circumcise and how circumcision protects us" (P2, (23 years old), Umlazi, February 2017). "Mothers understand circumcision and we must realise they also play a very important role in the household. Most times they are the ones planning things the proper way" (P34, (33 years old) Vulindlela, August 2017). "In the rural areas, people like my mother and my sister, they put pressure on you to go and get circumcised" (P29, (24 years old) Vulindlela 2017). "Most of the time women encourage their children to go circumcise, especially the young ones. I wouldn't know about girlfriends, I don't know if they encourage their partners to go" (P38, (34 years old), Vulindlela, August 2017).

However, there was a different opinion when it came to the men in the participants families. "What I can say is that older men do not understand circumcision. It could be that they have little knowledge of it, or it could be other reasons. You know elders, they have their own beliefs" (P38, (34 years old) Vulindlela, August 2017). "When you sit down with the elderly people, like my grandfather, they tell you that "No my grandchild even if you are uncircumcised.....

circumcision is not the cultural ritual of the Zulu people” (P22, (18 years old) Vulindlela, August 2017). “But when you talk to our grandfathers, they tell you look at your mother, look at your uncle, I was uncircumcised when I had them. I have no disease. Circumcision is something that is like fashion, something that people do, you see” (P25, (26 years old), Vulindlela, August 2017).

Emerging from my analysis of the participants responses, it was clear that women played an important role in the decision-making process of the uptake of VMMC. Men from both locations shared about their mothers, grandmothers and even sisters telling them about VMMC and asking them when they would become circumcised. Although, some of the participants equated this with being pressurised and were not too happy with the pressure they felt from women in their lives. Also, worth noting is that of the forty participants, thirty-five had engaged in conversations with their mothers and grandmothers about VMMC before making any decisions. Only five men revealed that their mothers and grandmothers were afraid for them to become circumcised due to the deaths surrounding circumcision and that it was not part of their cultural practices. The vital information we can gain from the experiences shared by the participants of the study is that women play a vital role in their decision-making process; therefore, information targeted at women to explain to men would help deliver the message to men. This suggests that family support is a strong indicator for willingness to undergo VMMC.

Of the five men whose families did not approve of circumcision, two mentioned that they had undergone the procedure without informing anyone and kept it as a secret. “Not all mothers are supportive, because right now, at home they do not know that I went to get circumcised”, (P38, (33 years old), Vulindlela, August 2017). Another participant also said his family were against circumcision, which was one of the reasons he had not undergone the procedure (P8, (22 years old) Umlazi, February 2017).

Partners

Seventeen of twenty participants aged 18 – 30 years described themselves as having multiple partners; only two participants were in committed relationships with one female partner each and the other participant described himself as single. In the older group of the twenty participants, five identified as married, another five were in committed monogamous relationships and the rest other half of the participants; described themselves as single.

Sixty percent of the men had spoken with sexual partners about circumcision and these conversations some ways influenced their decisions. Ninety percent of the participants believed that women preferred circumcised men. According to two participants, men that are coerced by their partners to become circumcised are weak, “as a man you need to stand your ground. It needs to be clear that you are a strong man or a weak one. If you are a weak man,

you will agree to things that in your heart of hearts you do not agree with. You will agree to things your partner likes, in that case you are a weak man; who is led by the nose” (P17 and P19, (33 years old and 30 years old) Umlazi, February 2017). One participant disagreed, “If you love your partner and she tells you to get circumcised, you would go. If you love her a lot and want to keep the relationship, you go” (P13, (38 years old, Umlazi, February 2017).

There seems to be a common notion that if a female partner encourages her male partner to undergo circumcision, she must have been unfaithful to her partner and has had sexual intercourse with a circumcised man, this is now why she wants her uncircumcised partner to become circumcised as well. In relation to this, three participants stated that they would have problems being asked by a partner to become circumcised and may ask the partner, “why, what is wrong? Have you experienced a circumcised man now?” (P32, (37 years old), Vulindlela, August 2017).

There were forty participants and from the total group thirty-two of the participants thought that PrEP was a good idea, but they would have problems explaining the reasons for taking it to their partners. Many of the men cited that it would be a cause for suspicion in their long-term relationships. If one was taking PrEP, their main partner may think that they were now unfaithful.

Okay, what if my partner does not know about PrEP and she comes over to my place, what will I say to her? We know that there are people who are still afraid to be out about the fact that they take ARVs, there are people who have no problems with people who take ARVs. Say I start taking PrEP as a means of prevention from infection. I may go to the clinic and convince them that I need the pills, and they give them to me. I will bring them home, say I leave them out in the open and then my partner comes to visit, how do I explain what these pills are for when she asks me? If I say, this is PrEP to help me protect myself from HIV infection; she will ask who infected me and am I trying to kill her? This means you do not only have sex with me. These are type of tough conversations we will have to have (P36, (35 years old), Vulindlela, August 2017).

Peers

Peers, social groups/associations are of great influence in getting circumcised, as revealed by some of the responses from the participants. The roles of that they play are in no means inconsequential. “What gave me the oomph to go and get circumcised is because all of my friends were already circumcised” (P3, (19 years old) Umlazi, February 2017). “We also saw others do it before us that is what made us do it (P7, (18 years old) Umlazi, February 2017). “We all went as school friends. When we got there, we got circumcised as a group, it was nice. That is what gave me the encouragement” (P5, (20 years old) Umlazi, February 2017). “If you

are not circumcised other brothers criticize you so most of us are circumcised because of that pressure” (P27, (23 years old) Vulindlela, August 2017).

Acceptability of VMMC and oral PrEP

The acceptability of VMMC and oral PrEP is highly likely to be influenced by potential users’ perceptions about the product. To understand participants’ perceptions of VMMC and oral PrEP, participants were asked about their thoughts on VMMC and PrEP as HIV prevention options. One participant responded that “when you are circumcised, your penis is clean, unlike before” (P3, (19 years old) Umlazi, February 2017). This was shared by another participant, “Ya circumcision is important and it works in many different ways. You are always clean” (P37, (34 years old), Vulindlela 2017). Another stated “to circumcise or not is the same to me because both do get infected with HIV. Whether you are circumcised or not” (P27, (23 years old), Vulindlela 2017). “Others are circumcised because of pressure as my brother has said that, the pressure sometimes it too much. A brother comes to you and brags about how women enjoy it when you are circumcised” (P28, (18 years old), Vulindlela 2017).

There were a few concerns on cost of PrEP and who should have access to PrEP. One participant was worried about the accessibility of oral PrEP to the general public as concerns of people engaging in risky sexual behaviour. “I say these pills should not be given to just anyone because when everyone gets them, they will just stop using the condoms and will not care about the fact that it is easy to get HIV infection because you know you are using the pills. It would be better if these pills are given to people who are couples only, people who know I am in a love relationship with a person who has HIV and I do not have it. Or those who are married, so that they can protect themselves whilst they continue loving each other well”, (P9, (22 years old), Umlazi, February 2017). “I for one, think it will be of great benefit to us” (P3, (19 years old, Umlazi, February 2017). “I think this is a very good thing” (P40, 35 years old, Vulindlela, August 2017). The participant already taking PrEP had his reasons for using the drug; “I love women and they love me too. So, I am able to get a girl today and we sleep together whether she is sick or not I take the pill in case something happened. So, this pill helps me by preventing me from contracting diseases easily whether I am wearing a condom or not and I make sure that if I sleep with a woman without using a condom, I do not miss my month to go collect so that I can take the test and know my status – whether everything is still going alright” (P30, 25 years old, Vulindlela, August 2017).

The acceptability of PrEP by the participants was high, although it was accompanied by the concern of the pill. Some participants inquired about the appearance of the pill and the questioning was around if the pill appeared exactly like an ARV pill. Stigma and discrimination around HIV are still issues in South Africa and many of the participants felt that they would

prefer if the pill would be unidentifiable as HIV preventative medication, not being closely linked with HIV would be ideal. There was preference for a nondescript pill to prevent discrimination and misperceptions from partners, family members and friends. This would enable individuals taking PrEP to disclose in their own time. These findings are similar to those in previous studies (Clark, et al., 2007; Abbas, et al., 2007; Galea, et al., 2011; Van der Elst, et al., 2012).

Perceived Barriers to Uptake biomedical preventative methods

According to the Health Belief Model, perceived barriers or obstacles to a recommended course of action are important factors in determining change in behaviour (Janz & Becker, 1984). Investigating the obstacles men associate with undergoing VMMC and the use of PrEP, insight can be generated and incorporated into strategies to improve uptake of VMMC and in the scale-up of PrEP.

The acceptability of undergoing VMMC in the older group of participants (31-39 years old) was not high. There are a few factors identified that are barriers to the uptake of this intervention by the participants such as, fear, concerns around stigma and discrimination, concerns around adherence, lifestyles, HIV testing before the uptake of both PrEP and VMMC. Participants also mentioned the financial burden and the impact of the scale up of PrEP to the economy of South Africa, particular the cost implications to the public health system and the potential of the increase of crime.

Fear and Stigma

Anxiety before surgical procedures can be expected and is normal but when that apprehension hinders or influences decisions, there is a problem. Some of the participants who were uncircumcised feared undergoing the procedure. Having heard varying stories from people within their social context about the procedure. Fear of pain, during and post procedure, fear of virility and the mandatory HIV test pre- circumcision. "Like I said, the thing that frightens me is that a guy I know who was swollen. I saw that people are dying" (P37, (30 years old), Vulindlela, August 2017). "It could happen that it doesn't work (penis, work after circumcision)" (P34, (35 years old), Vulindlela, August 2017). "When you go to the clinic, people start talking if they see you going there once, twice or three times and they start talking" (P22, (25 years old), Vulindlela, August 2017).

HIV testing before each procedure

One of the barriers to uptake of VMMC and PrEP for some of the participants was the mandatory HIV test that is done prior to undergoing the circumcision procedure or the PrEP

regimen. In order ensure that an individual is candidate for PrEP, medical practitioners need to determine their HIV status. When people fear the results, the potential consequences of the HIV test and social stigma, they are less likely to go for a test (Meiberg, et al., 2008). “The only problem about that place is that they first check your blood” (P25, (19 years old), Vulindlela, August 2017). “More people should be getting circumcised. Their problem is they are scared to know their status. Like my brother here cried out about checking the bloods, you get disappointed by the results so I will not be able to circumcise for the reason of having to first get checked” (P28, (20 years old), Vulindlela, August 2017).

The fear of being stigmatised within family, community and society is a deterrent to HIV testing, and therefore, uptake of biomedical HIV prevention interventions, such as, medical male circumcision and PrEP. Despite the many advances in HIV medication and care, there are people who still associate a positive result with death. They see being HIV positive as a death sentence and a cause for rejection and social isolation.

The perceptions of participants of this study towards HIV testing and subsequently a positive result from the test were varied. Some participants did not deem HIV as a life-threatening disease but rather an illness that was manageable with the right medication, while others had different ideas. P8, (22 years old), Umlazi, February 2017, likened being HIV positive as the same as being diabetic, this meant if you took care of yourself and adhered to your medication, one should live a long life. However, P26, (23 years old Vulindlela) did not agree with this perception, of HIV just being another chronic illness. He admitted to never having had an HIV test and the main deterrent to become circumcised was the HIV test he would need to take in order to undergo VMMC.

Some of the participants believed that awareness of one’s status may not always be a good thing, especially for those who associate a positive test result with death. This may lead to stress, behavioural changes (such as risky sexual behaviour, alcohol, and drug abuse), which may lead to weakened immune system and therefore deterioration of an individual’s health. A concern raised by several participants was that HIV testing should be promoted but only to people when they were emotionally ready to know their status.

People are different, maybe if you know you are HIV positive, I am not saying you are but if you knew, that would sit well with you. Other people may end up killing themselves because they now know they are HIV positive and they do not know how to contain the information from spreading into the community. Because we all know, if people see you go to the clinic more than twice or three times they start talking. Some people are not strong emotionally and cannot handle knowing their positive status.

These people can end up doing bad things because they know they have this thing (P38, (31 years old), Vulindlela, August 2017).

The association of HIV with death and mental distress may have an effect on the rapid physical deterioration of health; the low uptake of HIV testing results in the low uptake of VMMC and PrEP (Musheke, et al., 2013). Perhaps the scale-up of PrEP should include more counselling with users of the intervention, to ensure that individuals are armed with the necessary skills and have sound mental health to make better lifestyle choices.

Consistent use of PrEP: lifestyle

Almost all the participants raised concerns about the practicality of taking daily dosing PrEP, as it may interfere with their lifestyles. Of the forty participants, thirty-five of the participants had an issue with taking PrEP daily. Of this set, the median age was 30 years old; this indicates that younger men have an issue with PrEP not fitting their lifestyles. “I’d rather have HIV than take that pill every day” (P27 and P30, (both 18 years old), Vulindlela, August 2017). “I would rather be HIV positive; I cannot drink these PrEP pills. It would be better if we can take them once every two weeks but every day! It’s a no from me. You see I am not always at home at the same time every day and I also like partying” (P5, (18 years old) Umlazi, February 2017). “It might happen that I have gone out with my friends, to go drinking. I’ll become drunk, I won’t leave the party just to go take a pill! I would want to carry on drinking” (P28, (32 years old) Umlazi, February 2017).

Some of the other participants mentioned although they knew people who were HIV positive and taking ARVs, always have their daily dose with them, no matter where they were; they themselves would be reluctant to carry pills with them everywhere they went.

I will not carry the pills with me everywhere. I would be going partying, to get drunk, there would be no reason for me to have them with me. I already know I am HIV negative, I will just be taking these as a preventative measure, because if I do not take them it makes no difference in my life, I will not be infected with HIV if I do not sleep with anyone. So, there is no reason to have them with me at all times in case I miss my daily dose (P8, (22 years old), Umlazi, February 2017).

The same sentiments were shared by most of the participants, young and old. This indicates that proper adherence to the PrEP regimen prescribed by a medical practitioner may be hard for some to adhere to, not only due to their lifestyle choices but also due to the idea that people may have that PrEP is a preventative measure and therefore not too important to stick to the requirements to be taken daily.

Multiple Sexual Partners

In research, it is important to investigate the possibility for an increase in concurrent or sequential sexual partners. The basis of this assumption is the potential for men to perceive their own resistance to HIV infection as being safeguarded. Therefore, they begin to become more comfortable which can lead to the increase of the number of sexual partners they have, either over time or at the same time. The discussion within this section, aims to understand whether participants believe that VMMC and PrEP could afford them the benefit of acquiring more sexual partners than before the procedure or adhering to their regimen of PrEP.

The questions focused on the how the participants had conducted themselves post procedure (for those who had undergone VMMC), or in the hypothetical for those who had yet to become circumcised.

The discussions revealed that from the younger group (18 – 30 years old), 7 of the 20 participants (35%) had increased the number of sexual partners since they had undergone the VMMC. Some of the participants in this group were not circumcised, and those that were not, some declared that they would increase their partners. “The truth is one person is boring. Now and then you want to taste another banana instead of eating the apple always” (P25, (26 years old), Vulindlela, August 2017). “I would have many girlfriends, as I still do” (P22, (22 years old) Vulindlela, August 2017). “No maybe I would change when I want to taste how the side chick compares to my wife, if they are the same” (P23, (26 years old), Vulindlela, August 2017). “I did increase partners. I told myself I am fine now, I can do whoever” (P36 (35 years old), Vulindlela, August 2017). Though for one participant, the family played a huge role in reducing multiple sexual partners. “I stopped increasing the number when even my family were getting worried and reprimanding me” (P7, (23 years old) Umlazi, February 2017).

When probed further about the number of sexual partners they currently had, the Umlazi group 1 (18 – 30 years old), had shocking numbers. Of the 10 participants, only one participant had 1 partner. Another participant had 2 partners and the rest had more than 3 sexual partners; the most sexual partners by a single participant was 10 concurrently.

Two participants in the first focus discussion group in Umlazi revealed that they do not know the actual figure of the number of women they have sexual encounters with but that the number exceeded four concurrently. “If you go to your merchant and go buy three baggies, you might find that there is a girl there. She will ask to leave with you, if you ask her what she means, you ask if she wants to go smoke with you. If she leaves with you, it’s a given that you will have sex. This was not planned but it happens, this is now a once off sexual encounter,

you do not count this person as someone you slept with. It was a passing thing, you just found her available” P10, (23 years old), Umlazi, February 2017)

Many of the other participants in the Umlazi group (18 – 30) agreed with him. Casual sex was an activity that was standard practice amongst them. Despite the high risk of HIV infection from multiple partners, considering the aggregate number of past sexual encounters that a person is indirectly exposed to during unprotected sexual intercourse. In the discussions it was apparent that some of the participants also engaged in sexual intercourse with women known to have engaged in sexual intercourse within their close friendship circle.

Although many of the younger participants indicated that they do engage in casual sexual encounters, they stated that the perceived protection from HIV infection from becoming circumcised would drive them to engage with even more partners as there is now a semblance of protection. There would be an increase in both concurrent and sequential sexual partners, more so than in their uncircumcised state.

An alarming sixteen participants of the twenty participants in the older age group (30 – 39 years old) stated that they would increase their sexual partners if they became circumcised; those who were already circumcised had increased their partners since undergoing VMMC. Nine participants based in the peri urban Umlazi had concurrent multiple sexual partners. Only 6 participants from rural Vulindlela indicated that they have concurrent multiple partners. Of the remaining participants, 2 were taking anti-retrovirals (ART) and did not have multiple partners; and the other 2 were married and did not think they would cheat on their spouses and engage with extramarital partners.

The introduction of PrEP represents an important and potentially new addition to the resources of HIV prevention approaches. To scale-up PrEP, we need to better understand the factors that influence adherence and acceptability to attempt to determine real-world effectiveness. Understanding the social, behavioural, and structural factors that influence the use and adherence to PrEP can aid the development of scale-up strategies for people who may initiate the preventive option (Van der Elst, et al., 2013).

The discussions with the participants were based on hypothetical scenarios presented to them, only one participant of the 40 was using PrEP as a preventative measure. An overwhelming 36 out of 40 participants indicated that once on a regimen of PrEP, they would engage with multiple concurrent and/or sequential sexual partners. Many of them seemed to perceive PrEP as the panacea for HIV; they perceive that they will be protected enough to fulfil their desires of having multiple partners. “If I was using PrEP, there would be one leaving in the afternoon, and another one coming, that one leaves in the morning and another one comes after her.” (P8, (22 years old) Umlazi, February 2017). “My sexual partners would

increase because I wouldn't care if someone is HIV positive or not. They must just come. Even if the community is aware that person is on their way out" (person is dying because of HIV/AIDS) (P17, (30 years old) Umlazi, February 2017). "With PrEP, it means you can have many to taste. You would sleep with anyone" (P24, (21 years old), Vulindlela, August 2017). "There is PrEP, I will continue living the life I was living before, having many concurrent partners." (P34, (35 years old), Vulindlela, August 2017). "With PrEP anything goes"! (P8, (22 years old) Umlazi, August 2017).

Another stated how he would have multiple partners, mainly because of what he thinks is a legacy set by his grandfather.

All I can say is that I am Zulu, Mchunu. You see my grandfather had between four and five wives, which means he was a Casanova, I want to be like my grandfather. Taking PrEP will mean that I can be like him. I will be a lover just like him. I want three wives, I might add more, so to surpass my grandfather's number (P33, (35 years old) Vulindlela, August 2017).

These comments indicate that without enough knowledge and counselling, whilst on PrEP, many would engage in such risky behaviour.

Analysis of the data shows that concerns regarding risk compensation with technologies like PrEP are not unfounded and some individuals may foster an overly confident sense of protection, which leads to increased risk behaviour such as, increased concurrent and multiple sexual partners and reduced condom usage due to feelings of "immunity" to HIV infection (Galea, et al., 2011).

Condom Usage

Risk compensation refers to when a person experiences a perceived high sense of security, exposing the person to a greater risk overall, rather than being of protective benefit. The questions in the FGDs were geared towards uncovering whether participants understood the need to engage in safe sex, using condoms after becoming circumcised or while using PrEP; and why the need to do such existed. If participants expressed knowledge that condom use is required to ensure higher protection from HIV and other sexually transmitted infections (STIs), then evidence of low propensity to risk compensation would be said to be present.

Analysis of the data indicated that most of the participants understood that consistent condom use should be adopted or maintained whether they are circumcised or not or using PrEP in order to safeguard themselves from STI and HIV infection. However, this knowledge does not necessarily translate to actual living experience.

Only 12 participants admitted to continuing use of condoms after circumcision. Some admitted to not having ever used condoms and not particularly liking to use them. When asked if condoms were still essential after circumcision, for P10, (23 years old) Umlazi, August 2017) his condom usage depended on the partner he is engaging in sexual intercourse with. He has multiple partners and engages in casual sexual intercourse often. If he is with a 'steady' partner (who he has seen for several months), he does not use condoms. Many of the participants added that if they were with their 'main' partners, they were more likely to not use condoms, and if they were with their 'side chicks' (side partners), it also depended on which side partner it was; the 'main side' was trusted and if there were no condoms available they did not stress themselves with using one.

After the introduction of PrEP to the participants, they were questioned on their condom use if they were to use PrEP. Almost all the participants cited that they would not bother themselves with using condoms while taking PrEP. "Let's just say if I couldn't find a condom while on PrEP, I wouldn't bother myself with searching high and low to find one" P8, (22 years old) Umlazi, February 2017). This participant was not alone with this mentality. Many of the respondents shared that they would not be consistent with using condoms if they were to be using PrEP. P2: Okay I would have many girlfriends, as I still do" (P32, (33 years old) Vulindlela, August 2017). "They would increase (partners once on PrEP) (P38, (31 years old), Vulindlela, August 2017). "Yes they would increase" (P31, (30 years old) Vulindlela, August 2017). Many seemed to view PrEP as a panacea for HIV infection.

The only participant from Vulindlela on PrEP already, indicated that he does not use condoms all the time, even after taking PrEP. PrEP according to him has not changed his behaviour, he was already engaging in risky behaviour, but he sees PrEP as something to help him, if he "slips" up more than usual, he sees PrEP as his back up protection.

I say since we have these pills, there is no need to continue using condoms because when you take these pills your intention would be to feel your partner skin to skin. We don't like using condoms, we are forced to use it but if there is another solution, we will take it and discontinue using a condom. So, I see no need to use a condom when taking PrEP because I would have another agenda. I would not take PrEP whilst not intending to have skin to skin sexual intercourse with my partner P27, (30 years old), Umlazi, February 2017).

It is clear from the above illustration that before the rollout of PrEP, there needs to be education, campaigns, and proper counselling, enlightening people about the uses of PrEP, to ensure that they have sufficient knowledge of the medication. Most importantly, people need to understand that PrEP is not the panacea for HIV and that there is still a chance of infection,

and that it does not protect from STIs; using condoms is still very much necessary whilst taking PrEP.

Summary of Findings

The analysis of data illustrated in the above chapter has covered diverse aspects of the study. The findings detail the influences impacting on men's decision to undergo VMMC and use PrEP, and the high potential for risk compensation has been investigated. Knowledge and awareness of VMMC and PrEP in particular was low. The participants were supportive of circumcision, although some cited cultural issues as reasons for not undergoing circumcision, only two cited fear as a deterrent to the procedure. Almost all forty participants were supportive of using PrEP, however, there were concerns on lifestyle issues such as how the use of alcohol and going to parties would interfere with taking PrEP. Another main concern was the necessity to take the pills every day and the possibility of participants forgetting to take the pills daily. PrEP was expected to be the panacea for HIV infection because it was seen as back-up protection when condoms were inaccessible. Other social issues raised were for perception of HIV risk, relationship issues (trust issues), HIV testing prior to uptake of both VMMC and PrEP, and stigma. Participants understanding of the high efficacy of PrEP, made them perceive the need for using other HIV preventative methods as unnecessary.

The subsequent chapter provides a thorough discussion around the findings of the study and existing literature. These are supported by the theories employed in this study.

Chapter 6: Analysis and Discussion of Findings

Introduction

The purpose of this study was to investigate the concept of risk compensation among rural and peri-urban black men in the uptake of two biomedical interventions: voluntary medical male circumcision (VMMC) and pre-exposure prophylaxis (PrEP) for HIV prevention in Umlazi and Vulindlela in KwaZulu-Natal, South Africa. The study further assessed the decision-making process and possible influences of their choices in determining the HIV prevention methods. This chapter analyses and discusses key findings from the data presented and collected in Chapter Five. The findings were analysed through the constructs of the Health Belief Model (HBM), the Social Ecology Model for Communication and Health Behaviour (SEMCHB), and the Risk Compensation Theory as the conceptual frameworks underpinning this study. The chapter assess data collected in relation to the literature reviewed on existing research on HIV prevention in South Africa. In view of this, the chapter discuss the findings as they relate to the research objectives of the study.

Objective 1: *What are the key determinants that influence men's choice of biomedical HIV prevention intervention measures?*

What are the perceived risks for HIV infection?

A man's ability to use a new HIV prevention measure or implement any sexual reproductive health behaviour is influenced by a variety of factors. This includes his ability to use the product, perceptions about risk, and the perceived need. Perceived risk is one of the reasons that influences decisions that relate to HIV prevention behaviour (Ndzinisa, 2017; Caldwell and Mathews, 2016). Reasons could be, an individual realises that there is significant risk that could affect other people adversely; a person believes they are vulnerable to the risk, and thirdly the person must understand that there is a specific risk that exists (Kidd et al., 2017). The HBM suggest that the realisation of these factors should prompt behavioural change (Champion and Skinner, 2008).

The study's findings suggest that men from Umlazi and Vulindlela had a higher willingness to engage in risky behaviour. The younger men (ages 18 – 30) in the focus groups showed a minimal willingness to engage in risk activities in certain instances compared to the older group (ages 30 – 39). Therefore, the study found that willingness to take risk was dependant on age.

The study considered HIV risk for sex without a condom among participants. Studies suggest that condoms are highly effective in preventing HIV transmission when used correctly and consistently (Hearst and Chen, 2014). Literature also shows that consistent condom use is

significantly low, especially with primary partners (Yam, et al., 2016). Findings in this study show that twenty-five of forty men who participated in the study believe that engaging in sexual intercourse without a condom presents a high risk of HIV infection, particularly with other partners (other than their primary partner). Twelve men believed that there was no risk at all; and one of the men believed his risk was high as he did not like using condoms at all.

Although the finding shows that only fifteen of the men have low perception of risk when having condom-less sex, this does not represent the men who believe they are mostly only at risk when with their other partners. This means overall there is generally low perception of risk of infection. If there is low perception of risk of infection and an existing biomedical prevention method is available yet not used, questions arise on the introduction of new innovations such as oral PrEP.

Literature shows that having multiple sexual partners either concurrently or serially, greatly increases risk of HIV infection (Naicker, et al., 2015). Therefore, the risk for multiple sexual partners was assessed among the men taking part in the study. In sub-Saharan Africa, sex with multiple concurrent partners is still a factor in the high HIV prevalence (Shisana, et al., 2015). The data from the study showed that fourteen from twenty of the younger men (18 – 30 years old) increased their sexual partners since undergoing VMMC as they do not consider this a high-risk scenario.

Literature shows that oral PrEP has consistent rates of up to 75% protection benefits in many different populations and settings (Baxter and Abdool Karim, 2016). When oral PrEP is taken daily as prescribed, it has high efficacy as a biomedical HIV prevention option (Auerbach, et al., 2015). Participants were informed that oral PrEP was highly effective when taken daily as prescribed despite the doubts expressed by some participants. Majority of the men in the study were worried about taking a daily dosage of PrEP as they were afraid they would forget to take it or that it did not fit into the way they choose to live their lives. The men had a low perception of risk when the use of oral PrEP was discussed, 90% of the men who participated in the study indicated that once they had access to oral PrEP, they would have sex with as many women as possible; some even without using condoms. This finding suggested that the initiation of PrEP as a biomedical HIV prevention method would need to be part of a comprehensive combination prevention initiative, that would involve counselling on the use and effectiveness of oral PrEP used in combination with other biomedical HIV prevention methods such as condoms and VMMC. Studies show that oral PrEP is highly effective when used as part of combination prevention (Ndzinisa, 2017; Baxter and Abdool Karim, 2016). Perception of biomedical HIV prevention methods is influenced by many different factors, including an individual's ability to use the product, beliefs about the efficacy of the product and

many others (Frankis, et al., 2016). Exploring potential users' perception of VMMC and oral PrEP is important as these will be determining factors on the acceptance and uptake.

What are the perceived benefits of biomedical preventative options?

Voluntary medical male circumcision (VMMC) reduces men's risk of HIV infection by approximately 60% (Kapumba and King, 2019). For the uptake of any HIV preventive method, an individual needs to perceive the product to be beneficial to them. There are several individual factors that influence the decision to undergo circumcision. Some participants in the study acknowledged the hygienic advantages of circumcision and the reduction in the risk of HIV infection. This is consistent with previous research (George, et al., 2014; Kigozi, et al., 2009; Bonner 2001). The perceived increase in sexual pleasure for the men having undergone VMMC also mustered support for the procedure.

At the social level, enablers include the preferences of their sexual partners. Among the men there was a perception that circumcision enhances sexual pleasure and performance for them, this was a strong motivator for the men to undergo the procedure. Prevention from HIV and STIs seemed to be a secondary motivator. About twenty-four of the men were not aware of other health benefits of VMMC as it pertains to sexual health. Only two participants from forty knew about the health benefits for their female partners.

Oral PrEP is highly effective as an HIV prevention method. A number of studies affirm that HIV protection is more than 90% when there is strict high adherence to the daily dosing regimen (Heffron, et al., 2017; Baeten, et al., 2012; Hanscom, et al., 2016; Grant, et al., 2010). The WHO, in 2015, recommended that oral PrEP be implemented as part of HIV prevention programmes for people who were at a significant risk of HIV infection. Oral PrEP is discrete, there is no negotiation needed between partners for effective use, hereby, offering its users personal control over HIV prevention. This in turn empowers users and reduces their anxieties (Heffron, et al., 2017). All the men in the study felt that if oral PrEP was as effective as literature showed, then it would help reduce their chances of HIV infection. A man involved in the study was already taking oral PrEP, his reasoning for taking oral PrEP was that it was explained to him that if he adhered to the regimen as prescribed, he would be protected from contracting HIV. A self-claimed promiscuous man, it was clear that he was taking oral PrEP so he could continue engaging in risky sexual behaviours. Many of the men also thought that the introduction of PrEP would result in the raise in risky sexual behaviour as they overwhelmingly stated they would not care about using condoms while using oral PrEP.

How do social factors influence perceptions of biomedical interventions as HIV preventative measures?

Socio-cultural factors, including family, cultural norms, friends, ethnic identity, partners, and peers have been identified as factors influencing the acceptance and uptake of biomedical HIV preventative methods, VMMC and oral PrEP. In literature, women have shown to play an important role in VMMC activities through encouraging their partners and sons to go get circumcised and through discussions with other women (Kapumba and King, 2019; Osaki, et al., 2015; Layer, et al., 2013; Lanham, 2012). In this study, thirty of the forty men had engaged in conversations with either their mothers, grandmothers, and, or partners about VMMC before making any decisions on whether to become circumcised or not. Five men revealed that the women in their lives (mother and grandmothers) had fears regarding the circumcision procedure. Other reasoning included not been a culturally relevant procedure to undergo. The study and other previous research show that women are an integral part of the decision-making process. Therefore, women should be involved in scaling up VMMC programme activities where uptake is low.

Individual barriers were found to be fear of the procedure and the pain post operation associated with circumcision as well as a low perception of HIV risk. The stigma associated with HIV testing and family disapproval were identified as the social barriers. Shared experiences by peers were an important consideration when deciding to undergo VMMC. These findings are supported by literature (George, et al., 2014; Lukobo and Bailey 2007, Mavhu, et al., 2011; Ngalande, et al., 2006; Scott, et al., 2005).

Culture

Some segments of the South African population practice circumcision based on either their cultural or religious beliefs. In the black African communities, many ethnic tribes believe and practice circumcision. The most prominent being the Xhosa people. Circumcision in the cultural tradition practice is not only about removal of the foreskin but is whole process of “journey into manhood”. For many Xhosa men, VMMC would not be an option as the fear of stigmatisation once the greater community learns that one had a medical circumcision procedure instead of enduring the traditional method. These men fear being called names such as ‘inkwenkwe’ (meaning ‘boy’) and not having the respect of their peers, partners and community members. Within the groups, there were two participants that were Xhosa, they expressed that they would never encourage their ‘own’ to undertake VMMC services, purely over the backlash it poses afterwards.

The majority of the participants were Zulu, which did not practice circumcision traditionally since the days of King Shaka’s rule of the nation. Circumcision was practiced by Zulu people

prior to King Shaka's reign but ended when he abolished the practice. The current Zulu King, a descendant of King Shaka, King Goodwill Zwelithini, has since 2010 encourage Zulu men to become circumcised to help curb the spread of HIV infection (Gov.za, 2010; News24. 2018). Amongst the participants thirty of the men had been circumcised, however there was still an issue with the uptake of VMMC services. The men that had not been circumcised believe the procedure is not part of their culture and therefore was not something they were interested in doing or recommending to their boy child. Two men revealed that their family were against circumcision. Hence, they concealed from their families that they had undergone VMMC.

The stigma attached to up taking VMMC within the Xhosa community and the strong position of Zulu men that circumcision is not needed as it is a Xhosa and Western practice is exposed by the participants in the study. The likelihood of uptake of VMMC may bring shame to oneself, and in this instance, culture has an influence on the decision to uptake the HIV biomedical prevention option.

Women involvement

Women may be able to influence their male partners or family members in the decision making to be circumcised and practice other HIV preventative measures after VMMC. This has been illustrated in several studies (Lanham, L'Engle, Loolpapit, & Oguma, 2012; Riess, Achieng, & Bailey, 2014; Shacham, Godlonton, & Thornton, 2014). Most of the men in the study that had been circumcised reported that they had discussed the prospect of circumcision with their partners and, or their female family members. More than half of the men had been encouraged by their mothers in this regard. Women seem to be an integral part in decision making process when men consider circumcision. Incorporating women in intervention strategies for VMMC uptake may elicit a better response from men.

Stigma

Stigma and discrimination related to HIV/AIDS still exists globally, and presents itself differently from region to region, communities, and individuals. Meiberg, et al. (2008: 50) defines stigma as: "Any attribute of characteristic of a person that is deeply discrediting. This attribute is devalued in a particular context and calls into question the full humanity of this person." Persons are devalued, spoiled, or flawed in the eyes of others because of this negatively valued attribute and dehumanisation, threat, aversion, and social rejections are openly behavioural manifestations of stigmatisation.

For some of the participants, there was a strong fear of circumcision because of the mandatory HIV test prior to the circumcision procedure. A HIV test is also conducted before the prescription of PrEP. People fear results and the potential of a negative test and the social

stigma they may experience as a result of being HIV positive that they are less likely to go for a test (Meiburg, et al., 2008). This deterrent to HIV testing leads to poor uptake of biomedical HIV prevention methods that are available.

Objective 2: What is the risk compensation to the adoption of biomedical HIV prevention strategies?

HIV prevention options such as vaccines, antiretroviral medications microbicides and other biomedical prevention interventions including medical male circumcision and pre-exposure prophylaxis used in the prevention of HIV could lead to risk compensation. (Kalichman, Eaton & Pinkerton, 2007). Risky behaviours that are associated with antiretroviral medication for HIV and vaccines include unprotected sex and multiple sexual partners (Eaton & Kalichman, 2007). Risk compensation is the increase in risky behaviour ignited by the decrease in perceived risk or change in behaviour in response to a perceived change in susceptibility to a disease (Cassell, Halperin, Shelton, & Stanton, 2006).

Do men perceive a need for condom use and partner reduction upon the adoption of biomedical HIV prevention options?

A study found no evidence of risk compensation with the use of PrEP, however the in real world settings, the results are different. Implementation of PrEP in San Francisco found a high incidence of STIs and decrease as much as 41% in condom use (Fonner, et al., 2016). Clinical trials are not the best to assess risk compensation as participants receive behavioural counselling, which is often not the case in the real world.

Many of the men in the study reported that they engaged in unprotected sex with their primary partners post VMMC and that they mostly only used protection when with secondary or casual partners and even then that was only if there was protection available. During the FGDs, it was apparent that many of the participants mainly used protection if it was readily available. If there was no protection, they would still engage in sex. One of the participants was involved in a PrEP programme and his main reason was for being able to have as many partners as he could have. Most of the men in the study (circumcised and not circumcised) also admitted to having more than two concurrent partners.

Objective 3: Does age and/or location disparity influence risk compensation in biomedical HIV prevention options?

How do the participant's demography and physical environment affect their decision-making process?

The study was conducted in a rural and a peri-urban area to assess if there was a difference in the conduct of the men. The discussion with the men in Umlazi and Vulindlela revealed no direct or significant influence from the physical environment. The men that participated in the study had similar access to health services.

HBM emphasizes the importance of perceptions about one's perceived susceptibility to a health threat, perceptions about the significance of a health threat, and one's perceived capability to reduce their risk as determinants of health behaviour (Ndzinisa, 2017; Rimer, 2008). When an individual has low perceived vulnerability to a health risk, it decreases the motivation to take needed precautions. Both perceived risk and perceived susceptibility were low among men in this study. There were reported high rates of sexual activity and low condom use. The HBM posits that when perceived severity and perceived susceptibility are high, individuals are more likely to consider implementing measures to prevent HIV infection (Champion and Skinner, 2008). This is relevant for VMMC and PrEP implementation because users need to have a high perception of risk of HIV infection to consider the uptake of these prevention methods.

Self-efficacy is an individual's confidence in their capability to adopt preventative behaviour (Bandura, 1997). According to the HBM, an individual is more likely to adopt a health behaviour based on perception. Perceived severity is the men's assessment of how likely they are at risk to HIV infection and perceived susceptibility is the men's perception of their vulnerability to HIV infection in this study.

According to the HBM the adoption of preventative behaviour occurs if perceived risk and perceived susceptibility are high. Perceived severity and perceived self-efficacy must also be high. Also important are the benefits for taking up preventative behaviour and need to outweigh the barriers (Bandura, 1997). In this study the perceived severity was high but the perceived risk, perceived self-efficacy and perceived susceptibility need to be raised to encourage the acceptance of VMMC and oral PrEP uptake among the men.

Findings in this study suggested that acceptability is influenced by different factors. A number of the men in the study accepted both VMMC and oral PrEP. There were still some challenges. There was a lack of trust in the effectiveness of oral PrEP. According to literature, oral PrEP

has been effective consistently in different contexts and settings (Baxter and Abdool Karim, 2016; Karim, et al., 2010).

Conclusion

This chapter analysed and discussed the data collected through focus group discussions. The aim was to understand risk compensation among rural and peri-urban African males in the uptake of biomedical HIV prevention interventions and the factors that influence their decision among men in Umlazi and Vulindlela, South Africa. The final chapter is a conclusion to the study.

Chapter 7: Conclusions and Recommendations

Introduction

The study explored the perceptions of risk and the acceptability of VMMC and oral PrEP among African males in Umlazi and Vulindlela, South Africa. The study further examined the possibility of risk compensation in the uptake of biomedical HIV preventative interventions. Constructs of the Health Belief Model (HBM), the interpersonal level of the Social Ecology Model for Communication and Health Behaviour (SEMCHB) and Risk Compensation Theory were the theoretical frameworks that underpinned the study. The constructs aided in the researcher understanding of how men in Umlazi and Vulindlela perceive VMMC and oral PrEP and how these perceptions influence their acceptability of VMMC and oral PrEP.

Literature reviewed in the study explored the complexities of previous and current HIV prevention options such as VMMC and oral PrEP. There are still some barriers to the uptake of VMMC due to various factors. Before oral PrEP is widely available in South Africa, it is important to understand perceptions and acceptability of the HIV prevention option. This will aid in the conceptualisation of targeted HIV prevention efforts.

Hence, the study aimed to address questions of perceptions, acceptability, and awareness of VMMC and oral PrEP among men in Umlazi and Vulindlela. If the men believe they are at risk of HIV infection and think HIV is a serious health issue to want to avoid, they are more likely to consider their options for HIV prevention. It is important to establish men's perceptions about their risk to HIV infection as this will determine the measures they will take to protect themselves. Many of the men were aware of the severity of the virus but they perceived their risk and susceptibility to HIV infection as low. Findings in the study showed that the men engaged in risky behaviour and the risky behaviour increases with the use of HIV prevention methods. The acceptability of VMMC was low, despite the majority of the men being circumcised while the acceptability of PrEP was high.

The high acceptability of PrEP could be credited to the potential for protection against HIV infection and the thought of being able to engage in risky behaviour. Most men admitted that with the introduction of PrEP, they are more likely to engage in risky behaviour. This is important to note as it shows that there needs to be counselling involved in the rollout of PrEP.

The HBM posits that an individual is likely to adopt health behaviour when the perceived severity and perceived susceptibility are high and there are perceived benefits to the adoption of behaviour and the self-efficacy is high. Men in the study reported that taking PrEP on a daily basis would not be feasible as it would not always be fit into their lifestyle. This shows that the taking of oral PrEP would present a challenge to the men. Low efficacy could deter acceptance

and uptake of oral PrEP. By this, Health communicators would need to raise self-efficacy for users.

The SEMCHB was useful to the researcher in understanding how social relationships influence the acceptability and perception of VMMC and oral PrEP among men in Umlazi and Vulindlela.

Further considerations for future research

Both VMMC and PrEP have the potential to greatly reduce new HIV infection rates among men. However, both biomedical HIV prevention interventions can only be effective if used properly and accepted fully. Findings of the study reveal that there are a few issues to look into for the acceptability and uptake of oral PrEP and VMMC. There is a need to involve women in the promotion of HIV prevention methods such as VMMC and PrEP, as most of the men in the study took up VMMC at the suggestion of women in their lives.

The study findings revealed that there may be lack of knowledge of HIV/AIDS and biomedical HIV prevention options. Health communication strategies that are developed need to address the lack of understanding of HIV infection. There may be a general feeling of HIV information fatigue. The findings of the study show that there still needs to be more education focused on teaching people about HIV. Combination prevention will be the only way to help curb new HIV infection rates. This includes education campaigns and behavioural counselling.

Limitations of the study

There were a few limitations in the study. The findings reflect the perceptions and acceptability of VMMC and oral PrEP among men in Umlazi and Vulindlela, South Africa who took part in the study. Therefore, this only offer insight into one segment of the population. The sample size was small to allow for generalisability of findings to other settings.

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Appendix 1

INFORMED CONSENT FORM

TOPIC: “Exploring HIV risk compensation among men with medical male circumcision uptake and oral pre-exposure prophylaxis use. A comparative study in Umlazi and Vulindlela in KwaZulu-Natal”

Correspondence with interviewees: Letter of invitation to participate in the study

Dear Sir

I am Lungelo Khanyile (209536577) a Master’s student at the University of KwaZulu-Natal. I am collecting data to complete a study on understanding the decision making process of men when choosing to undergo medical circumcision or not. This study is conducted under the supervision of the University’s Centre for Communication, Media and Society (CCMS). My supervisor’s name is Dr Eliza Govender. I am writing to request your participation; your input will add considerable value to this research project.

Participation in this study is voluntary, you may choose not to participate or recant at a later stage without negative consequences. There will be no monetary consideration for participating in the focus group or interview.

Confidential information will not be used without your consent. If you agree to be part of the focus group and interview session, you have the right to use a pseudonym for the purposes of this research, so your real identity will not be revealed in the final report. As a respondent you will be treated with dignity and respect.

I request the use of an audio-recorder in both the focus groups and interviews. The data will be kept safely for a period of five years at the University of KwaZulu-Natal, CCMS offices.

Should you be unclear on anything contained in this form, please feel free to ask me about it at any time.

Thank you for your time.

Your keenness to participate in this study will be greatly appreciated.

Details of the researcher and institution of research:

	address	Phone Number	Email address	
Researcher	Lungelo Khanyile	+27 73 032 3192	le.khanyile@gmail.com	
Department	Centre for Communication Media and Society (CCMS)	+27-31-260-2505	http://ccms.ukzn.ac.za/Homepage.aspx	
Institution	University of KwaZulu-Natal (UKZN) Howard College Campus, Masizi Kunene Ave, Glenwood, Durban, South Africa.	+27-31-260-1813	www.ukzn.ac.za	
Supervisor	Dr Eliza Govender	+27 (0)31 260 4690	eliza.govender@caprisa.org	
Chair, UKZN Human Sciences Research Committee	Dr. Shenuka Singh	+27-31-260-8591	singshen@ukzn.ac.za	
Committee Clerk, UKZN Human Sciences	Ms P. Ximba	+27-31-2603587	ximbap@ukzn.ac.za	

Research Committee			
<p><i>Please do not hesitate to contact any of the above persons, should you want further information on this research, or should you want to discuss any aspect of the interview process.</i></p>			
Signed consent			
<ul style="list-style-type: none"> I understand that the purpose of this interview is for solely academic purpose. The findings will be published as research projects/dissertations, and may be published in academic journals. 	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<ul style="list-style-type: none"> I understand I may choose to remain anonymous. (Please choose whether or not you would like to remain anonymous.) 	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<ul style="list-style-type: none"> I understand that I may choose whether or not my name will be quoted in remarks and or information attributed to myself in the final research documents. I choose to use a pseudonym, not my real name. 	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<ul style="list-style-type: none"> I understand that I will not be paid for participating. 	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<ul style="list-style-type: none"> I understand that I reserve the right to discontinue and withdraw my participation any time. 	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<ul style="list-style-type: none"> I consent to be frank to give the information. I consent to the use of audio-recorder during focus group discussions. 	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<ul style="list-style-type: none"> I understand I will not be coerced into commenting on issues against my will, and that I may decline to answer specific questions. 	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<p>* By signing this form, I consent that I have duly read and understood its content.</p>			
<div> <div> <div></div> <div>Name of Participant</div> </div> <div> <div></div> <div>Signature</div> </div> <div> <div></div> <div>Date</div> </div> </div>			
<div> <div> <div></div> <div>Name of Researcher</div> </div> <div> <div></div> <div>Signature</div> </div> <div> <div></div> <div>Date</div> </div> </div>			

Appendix 2

IFOMU YEMVUME

TOPIC: “Exploring HIV risk compensation among men with medical male circumcision uptake and oral pre-exposure prophylaxis use. A comparative study in Umlazi and Vulindlela in KwaZulu-Natal”

Ukuxhumana nokuzoxoxiswa nabo: Incwadi yesimemo yokuzibandakanya ocwaningweni

Ngiyabingelela Baba

NginguLungelo Khanyile (209536577) owenza iziqu ze-Masters eNyuvesi YaKwaZulu-Natal. Ngiqoqa ulwazi ukuze ngiphothule ucwaningo lwami lokuqonda ukuthathwa noma ukungathathwa kwezinqumo ngamadoda uma ekhetha ukusokwa ngokwezempilo. Lolu cwaningo lwenziwa ngokululekwa yi-University's Centre for Communication, Media and Society (CCMS). Umeluleki nguDr Eliza Govender. Ngicela ukuba uzibandakanye, okuyoshiwo nguwana kuyosiza kakhulu kulolu cwaningo.

Ukuzibandakanya kulolu cwaningo kungukuzithandela, ungakhetha ukungazibandakanyi noma uyeke esikhathini esizayo ngaphandle kokuthi kube nemiphumela engemihle. Angeke ukhokhelwe mali ngokuzibandakanya engxoxweni neqembu elicwaningwayo.

Angeke kusetshenziswe ulwazi oluyimfihlo ngaphandle kwemvume yakho. Uma uvuma ukuba yingxenye yeqembu elicwaningwayo kanye nokuxoxisana, unelungelo lokusebenzisa igama okungelona lakho ngenhloso yalolu cwaningo, ngakho-ke ubuwena (igama lakho) angeke budalulwe embikweni wokucina. Njengophendulayo, uyophathwa ngesizotha nangenhlonipho.

Ngiyacela ukusebenzisa isiqophamazwi kuzona zombili izingxoxo neqembu kanye nokuxoxisana nomuntu ngamunye. Ulwazi luyogcinwa endaweni ephephile isikhathi esiyiminyaka emihlanu emahhovisi akwa-CCMS, eNyuvesi YaKwaZulu-Natal.

Uma ungacacelwa kahle nanoma yingani ekule fom, sicela ukhululeke ukuthi ubuze ngakho nanoma yingasiphi isikhathi.

Siyabonga ngesikhathi sakho.

Intshisekelo yakho yokuzibandakanya kulolu cwaningo iyabongeka kakhulu.

Imininingwane yomcwaningi kanye nesikhungo socwaningo nansi:

	Ikheli	Inombolo yocingo	Email address
Umcwaningi	Lungelo Khanyile	+27 73 032 3192	le.khanyile@gmail.com
UMnyango	Centre for Communication Media and Society (CCMS)	+27-31-260-2505	http://ccms.ukzn.ac.za/Homepage.aspx
Isikhungo	University of KwaZulu-Natal (UKZN) Howard College Campus, Masizi Kunene Ave, Glenwood, Durban, South Africa.	+27-31-260-1813	www.ukzn.ac.za
Umeluleki	Dr Eliza Govender	+27 (0)31 260 4690	eliza.govender@caprisa.org
Usihlalo, UKZN Human Sciences Research Committee	Dr. Shenuka Singh	+27-31-260-8591	singshen@ukzn.ac.za
Unobhala wekomiti, UKZN Human	Ms P. Ximba	+27-31-2603587	ximbap@ukzn.ac.za

Igama lomcwaningi	Isiginisha	Usuku

Appendix 3

UKZN ethical clearance



18 October 2016

Ms Lungelo E Khanyile 209536577
School of Applied Human Sciences
Howard College Campus

Dear Ms Khanyile

Protocol reference number: HSS/1104/016M

New project title: Exploring HIV risk compensation among men with medical male circumcision uptake and oral pre-exposure prophylaxis use. A comparative study in Umlazi and Vulindlela in KwaZulu-Natal.

Full approval notification- Amendment application

This letter serves to notify you that your application for an amendment dated 04 October 2016, has now been approved as follows.

1. Change of title.
2. Change in research site from KwaMashu to Umlazi.

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the school/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

Best wishes for the successful completion of your research protocol.

Yours faithfully



Dr Shamila Naidoo (Deputy Chair)

/px

cc Supervisor: Dr Eliza Govender
cc Academic Leader Research: Dr Jean Steyn
cc School Administrator: Ms Ayanda Ntuli

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

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