A comparative study of students' attitudes, preferences and acceptance levels towards microbicide products; the tenofovir gel and the dapivirine ring at UKZN

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By

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Dissertation presented in fulfilment of the Degree of Master of Social Science,

In The Centre for Communication, Media & Society,

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Ethical Approval Number: HSS/ 0501/014M

December 2015

Declaration

I Phiwe Babalo Nota, declare that the work presented in this dissertation is my own, and that any work done by other persons has been duly acknowledged.

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Signature_____ Date: 22 March 2016

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Acknowledgments

"*But the Lord stood with me and gave me strength*"
2 Tim 4:17
Firstly, and most importantly acknowledgment goes to the Lord who gave me strength to see this journey through.

This research study was made possible through funding provided by the Centre for the AIDS Programme of Research in South Africa (CAPRISA).

I would like to express gratitude to the following people who played a significant part in this research journey:

I would like to extend my gratitude towards my supervisor Dr Eliza Govender who was supportive and helpful throughout this research study. I have learnt enormously from your supervision and tutelage.

Prof Keyan Tomaselli and Prof Ruth Teer-Tomaselli- I am grateful for the second home you welcomed me into (CCMS), both of you have been like my second set of parents.

To my dear sister who tirelessly listened to all my research ideas, and never failed to show support towards me, thank you Bongo.

Yonela Vukapi, words cannot express how we travelled this journey together, thank you for all the late nights and brain storming-sessions we had. Indeed, as iron sharpens iron. Thank you also to Lebo, Cwayita and Phumeza.

To my dear brothers, Funsho Japhet, thank you for teaching me the importance of education. Thank you for the guidance and motivation. Thank you Someleze and Daniel for all the support, and your consistence in asking about my progress.

Finally, thank you to my parents for the support and love you both showed me throughout my years of studying, I am grateful.

Abstract

Despite vast efforts to curb HIV and AIDS, the global epidemic has evolved over the past three decades, with Southern Africa[1] proving to be the epicentre of the epidemic. Unlike women in other parts of the world, statistics show that African women are disproportionately vulnerable to HIV infection, with women between the ages of 15 to 24 twice more likely to be infected then men[2] in Southern Africa. Female vulnerability to HIV infection is exacerbated by various factors including social, cultural, economic and biological factors.

Microbicides are biomedical technologies that are designed to give women some degree of control in prevention of HIV and other sexually transmitted diseases. Microbicides refer to antiretroviral-based substances: they are biomedical tools which could empower women who cannot negotiate safe sex practices and as such, they have the potential to change the landscape of the HIV and AIDS pandemic. However, there are no microbicide products that have been licenced and made available for women to use as they are still undergoing clinical trials. There is a dearth of research of female perceptions, attitudes and possible acceptance levels of microbicides as HIV prevention methods.

This dissertation provides a small-scale comparative study of two microbicide products; the tenofovir gel and dapivirine ring. This study investigates UKZN female students' perceptions, attitudes and acceptance levels towards microbicides as HIV prevention methods. By employing a culture-centred approach, this dissertation seeks to reach a holistic understanding of female students' preferences towards HIV prevention methods for the purpose of knowing what potential users of microbicides desire and need. A mixed method approach formed the methodological basis of this research study: two focus group discussions with UKZN female students were conducted, and 100 self-administered questionnaires were used to collect data. Thematic analysis was used to develop themes that emerged from the data collected.

Key findings from the questionnaire revealed that a high percentage (62%) of female students asserted that they would use microbicides if they were available as HIV prevention methods;

[1] [1] Defined here as including eight countries: Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe.

[2] International Prevention for Microbicides: Available from http://ipmglobal.org/about-ipm Accessed [22 July 2015]

66% of the female respondents stipulated that they would prefer using the tenofovir gel as opposed to the dapivirine ring. Female students indicated that microbicides must be available in other forms. It was concluded that the formulation in which microbicides are developed is important: product characteristic will influence acceptability of the products as well as adherence. Cultural issues will impact the acceptance and uptake of microbicides. It was also discovered that male involvement in microbicide development might foster better acceptance and uptake of these biomedical tools.

Key words: HIV prevention technologies, PrEP, Microbicides, tenofovir gel, dapivirine ring, women empowerment.

Definitions of key terms

Gender refers to a culturally defined set of economic, social, and political roles, responsibilities, rights, entitlements, and obligations associated with being female and male, as well as the power relations between and among women and men and boys and girls. The definition and expectations of what it means to be a woman or girl and a man or boy, and the sanctions for not adhering to those expectations, vary across cultures and over time and often intersect with other factors such as race, class, age, and sexual orientation. Transgender individuals, whether they identify as men or women, are subject to the same set of expectations and sanctions.

Empowerment means expansion of people's capacity to make and act upon decisions affecting all aspects of their lives — including decisions related to health — by proactively addressing socioeconomic and other power inequalities in a context where this ability was previously denied. Programmatic interventions often focus specifically on empowering women, because of the inequalities in their socioeconomic status.

Microbicide – The term "microbicide" refers to substances being studied that could be used in the vagina or rectum to reduce the risk of HIV infection via sexual exposure. The microbicide products that are in the most advanced stages of testing are:

For women — they are formulated for vaginal use and do not directly protect men from HIV.

ARV-based — they contain antiretroviral drugs like the ones used for HIV treatment. Microbicides are unlikely to be available over the counter — because they require HIV testing to avoid use by HIV-positive women, which could promote drug resistance.

Formulated as a gel or a ring — the gel is inserted into the vagina before and after sex, and the ring is worn in the vagina continuously and changed every 28 days.

Partially protective — if they are effective, they will reduce a woman's HIV risk but will not protect her completely. Microbicides are likely to be less effective than male and female condoms. Other microbicide formulations are also being developed and tested, including non-ARV-based microbicides, rectal microbicides, and multipurpose technologies to protect against pregnancy, HIV, and sexually transmitted infections (STIs). Eventually microbicides could come in multiple formulations, such as films, injectables, suppositories, and nanofibers.

Figure: Adapted from: Manual for Conducting a Gender Analysis for Microbicide Introduction.

List of Acronyms and Abbreviations

ABC	Abstain, Be Faithful, Condomise
AIDS	Acquired Immunodeficiency Syndrome
ASPIRE	A Study to Prevent Infection with a Ring for Extended Use
AVAC	Global Advocacy for HIV Prevention
BAT24	Before and After dosing strategy
CCA	Culture Centred Approach
CCMS	Centre for Culture, Communication and Media Studies
CAPRISA	Centre for the AIDS Programme of Research in South Africa
FACTS	Follow-on African Consortium for Tenofovir Studies
GBV	Gender Based Violence
HIV	Human Immune-virus
ISS	Interpretive Social Science
KZN	KwaZulu-Natal
MCP	Multiple Concurrent Partners
MMC	Medical Male Circumcision
MTN	Microbicide Trials Network
PrEP	Pre-Exposure Prophylaxis
STD	Sexually Transmitted Disease
UKZN	University of KwaZulu-Natal
UNAIDS	The Joint United Nations Programme on HIV and AIDS
VAW	Violence Against Women

VOICE	Vaginal and Oral Interventions to Control the Epidemic
WHO	World Health Organisation

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Chapter 1: Introduction

It has been three decades since the first diagnosis of HIV in the world. Since then, the virus which was reported in isolated areas has spread to almost every part of the world. It is strongly speculated that the first case of HIV was in 1981, in Los Angeles in the United States (Abdool Karim, 2005; Rohleder et al., 2009). However Southern Africa[3] has become the epicentre of the HIV and AIDS pandemic, with 25 million people estimated to be living with HIV in 2012[4]. We see from these figures that HIV and AIDS as an epidemic has spread at an incredible rate. Regions in Southern Africa are the most affected by the HIV and AIDS epidemic; these regions have proven over the past three decades to be the hub of HIV and AIDS, with the highest HIV prevalence rates in the world.

South Africa in particular has one of the highest numbers of HIV infected individuals, with 6.4 million people estimated to be living with HIV in 2012 (CDC.Gov, 2015). Amidst these glaring statistics, young women and girls bear the greatest burden as they are most vulnerable to HIV infection. Women have always been vulnerable to HIV infection in South Africa; this is due to several socio-economic factors as well as biological factors that give rise to vulnerability. Women from all age groups are more susceptible to HIV infection compared to men, furthermore young women and girls in the age groups 20-35 have proven to be the most vulnerable to HIV infection (Shisana et al., 2014).

For women and young girls, HIV risk is not only driven by biological vulnerability, but also gender-power relations that hinder women from following behavioural prevention measures such as "Abstain, Be faithful, and Condomise" (ABC)[5]. Currently, the most effective means of HIV prevention are dependent on men, leaving women with little or no autonomy over their sexual health. The male condom in particular is the most effective HIV prevention method: however its effectiveness depends largely on the male's willingness and ability to use the condom correctly (Kelly et al., 2015). The female condom is the only female-initiated method of protection against HIV infection: yet, this prevention method has several limitations. One of the major limitations of the female condom is the fact that women still need some level of consent from their partners to use the female condom. It is therefore in

[3] Defined here as including eight countries: Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe.
[4] http://www.avert.org/hiv-aids-sub-saharan-africa.htm
[5] Shelton, Halperin, Nantulya, Potts, Gayle, & Holmes, 2004

this context where new HIV transmissions transpire, leaving women with the disproportionate burden of HIV infection.

The rapid speed at which the HIV and AIDS epidemic has escalated, and the way in which the virus is spreading has underscored efforts to develop new biomedical technologies to facilitate effective HIV prevention for women. Behavioral interventions have played an indispensable role in reducing the spread of HIV, and bringing awareness pertaining to safe sex practices for effective prevention against HIV. However these efforts have not been able to halt HIV prevalence rates (Stirratt and Gordon, 2008). As a result, there has been a great need for new HIV prevention methods that can complement existing behavioral interventions, particularly for women (Stirratt and Gordon, 2008). Ignoring the dominant role of men in sexual decisions can prove to be detrimental in curbing the HIV epidemic; there is a need to now design and implement HIV prevention methods that will empower women to make safer sex choices.

The urgency of devising new HIV prevention methods has led to the development of biomedical technologies that women can employ to prevent HIV transmission. In collaboration with HIV prevention methods that are currently available, microbicides tailored for women promise to give females a degree of control over safe sex practices. Microbicides refer to ARV-based substances which can be inserted into the vagina or rectum to reduce the transmission of HIV and other sexually transmitted diseases[6].

This research study examines perceptions of female university students towards microbicides as HIV prevention methods. More specifically, this study investigates attitudes, preferences and acceptance levels towards two microbicide products; the tenofovir gel and the dapivirine ring. Microbicides could come in a number of forms; creams, gel, films and vaginal rings that release the active ingredient over a varying period of time (AVAC, 2015).While microbicides are being developed and tested as HIV prevention methods that women can use to protect themselves, it is crucial that extensive research is conducted to study and understand female perceptions of and attitudes towards these biomedical products before they become licensed and available. Research reveals that even though several studies have been conducted and are continuously being developed, there is a dearth of knowledge and understanding on women's

[6] http://www.who.int/hiv/topics/microbicides/microbicides/en/

preferences towards microbicides as HIV prevention methods. Understanding women's preferences towards several potential microbicide products will ensure development and introduction of microbicides that are both relevant and suitable for potential-users.

This study adopts a simple working definition for perceptions; according to the Merriam Webster Encyclopedia, perceptions refer to the way one thinks or understands something (Merriam-webster.com, 2015). This study will therefore examine what female students think about microbicides as developing HIV prevention technologies. Attitudes on the other hand refer to a person's mind set towards a thing or concept, attitudes also include people's behavior or tendency to act in a particular way towards something (Pickens, 2005).

Background to the study

In 1990, Professor Zena Stein published a paper entitled "*HIV Prevention: The Need for Methods Women Can Use"*. This publication brought support from several researchers who noted the bold suggestion for female-controlled prevention methods that would assist in alleviating the HIV and AIDS epidemic. This marked the beginning of extensive research on HIV prevention methods including microbicides. After more than two decades, the development of microbicides has faced a series of challenges, with several microbicides undergoing clinical trials and failing to become licenced.

Currently, microbicide products that show significant HIV risk reduction include; the tenofovir gel and the dapivirine ring (AVAC, 2015). The tenofovir gel is a vaginal gel with 1% tenofovir, which is an ARV drug (CAPRISA, 2010). The CAPRISA 004 before and after dosing strategy is referred to as BAT-24, the gel is applied within 12 hours before anticipated sexual intercourse and within the next 12 hours after sexual intercourse, with a maximum of two doses within a 24 hour period (CAPRISA, 2010). The results for this trial revealed that the tenofovir gel reduced women's risk of HIV infection by 39%, and a 51% lower risk of genital herpes (CAPRISA, 2010). The vaginal ring is made of flexible silicone that fits inside the vagina, diffusing the dapivirine ARV drug over a period of four weeks (AVAC, 2015). The dapivirine ring is inserted into the vagina, and changed every 28 days. The development of vaginal rings is perceived to encourage better acceptance and uptake because it offers longer protection and less behavioral requirements, compared to the gel. Other rings in

development include CONRAD's 90-day ring containing both tenofovir and a contraceptive (MacQueen et al., 2014).

While microbicides are still being tested in clinical trials, there is a great need for research to be conducted on women's attitudes and possible acceptance levels of microbicide products. A study conducted by Kelly et al. (2015) highlights a gap in research of what women's attitudes towards such products may be, and what influences these attitudes. Uptake and acceptability of microbicide use will be influenced by many intersecting factors such as culture, age, country and relationship status (Ramjee, 2011). Therefore there is an imperative need to investigate cultural and contextual norms that may influence acceptance and uptake of microbicides when they are licensed. By employing a Culture-Centred Approach (CCA), this research study will explore not only female students' perceptions and attitudes towards microbicides, but also the cultural context that inform these perceptions. Acknowledging the cultural and contextual influences on female's perceptions towards HIV prevention methods will be crucial in the development of new HIV prevention methods, in that new prevention methods can be designed to be contextually appropriate.

To ensure future success in introducing microbicides as HIV prevention methods, it is necessary that understanding is established concerning women's attitudes, preferences and perceptions towards microbicides. Understanding women's perceptions of and attitudes towards microbicides will aid in developing effective product introduction strategies. According to Durden (2011), even though the development of the tenofovir gel has offered a biomedical solution to HIV infection, it is acknowledged that that the need for the gel is based in understanding social dynamics that give rise to the HIV epidemic. Extensive research pertaining to social and behavioral factors that may influence the acceptance and uptake of microbicides needs to be conducted. Melkote and Steeves (2001) explain that, if development is to have relevance to the people who need it, it must start where the real need and problems exists. If introduction of microbicides is to be successful, there is a need to have dialogue with women who may use these products. Microbicides promise to give women a degree of control over safe sex practices, therefore it is imperative for social scientists to understand women's preferences, attitudes and possible acceptance levels of microbicides as HIV prevention methods, so as to ensure that when microbicides are available, they meet the desired preferences of women.

Research Aims and Objectives

This study was conducted within the field of Health Communications. Additionally, the research was made possible by the administration of the Centre for Communications Media and Society (CCMS). Therefore, the basis of this study is within Health Communications, with prescriptions from a Cultural Studies approach. The objectives of this research are therefore rooted in the scope of studying how to formulate effective and relevant health messages. The primary objective of this study is to explore female (UKZN students) attitudes, preferences and possible acceptance levels towards microbicides; the tenofovir gel and the dapivirine ring, as developing biomedical HIV prevention technologies that women can use. This dissertation aims to reach a holistic understanding of female students' preferences in HIV prevention methods for the purpose of knowing what potential users of microbicides desire and need in an HIV prevention product.

In light of the above, the secondary objectives of this study are:

- To identify women's preferences with regard to HIV prevention methods. An understanding of female perceptions of HIV prevention methods that are currently available will aid in studying female's perceptions towards developing HIV prevent technologies. This objective will ensure that in-depth insight is reached in our aim to study women's preferences towards microbicides; the objective will be met by systematically analyzing data collected from focus groups, and questionnaires.
- To investigate the attitudes of women towards microbicide products as an HIV prevention technology. A general understanding of how women perceive microbicides as HIV prevention methods will later assist in examining women's preferences with regard to two specific microbicides; the dapivirine ring and the tenofovir gel. Women's attitudes will be explored by again analyzing the feedback received from the females (who are part of my study), through the various data collection methods that will be employed.
- To identify women's attitudes, preferences and acceptance levels with regard to two specific microbicide products; the tenofovir gel and the dapivirine ring. These two microbicide products are different in form and in their application regimen; preferences and acceptance for each delivery formulation and specific product characteristic will be identified with the aim of informing development of relevant and desirable microbicide products. This will be achieved by categorizing the

feedback from the women about the tenofovir gel and the dapivirine ring, to compare which product women prefer.

This study seeks to contribute knowledge about women's attitudes to and possible acceptance levels of microbicide products, specifically through an analysis of the tenofovir gel and the dapivirine ring, within the University of KwaZulu-Natal context. This study assesses female student's perceptions of HIV prevention methods, and microbicides as developing prevention methods. Furthermore, this study seeks not only to determine women's preferences towards microbicides, but also to understand what cultural and contextual factors inform these preferences and perceptions. Microbicides promise to give women a degree of control over safe sex practices; these biomedical technologies therefore have the potential to reduce the extent of the HIV and AIDS epidemic in South Africa. It is therefore imperative for social scientists to understand women's preferences towards HIV prevention methods as advances on microbicides in clinical trials are being made.

In light of the above, this study will specifically focus on the following questions:

- Do UKZN female students believe they are vulnerable or at risk of HIV infection?
- What are the attitudes of females (university students) towards HIV prevention methods that are currently available i.e. the female condom and the male condom?
- What are these women's preferences with regard to HIV prevention methods: do females want to use female condoms (taking initiative in the process of safer sex) or do they prefer their male partners to wear male condoms, trusting their partners to initiate safer sex?
- What are UKZN female students' attitudes to and possible acceptance levels of microbicide products, specifically with regard to the tenofovir ring and the dapivirine ring as possible HIV prevention methods?

Structure of Dissertation

Chapter One provides a brief background of this study by highlighting HIV and AIDS as an epidemic that has evolved in the past three decades. Also this section draws attention to women's disproportioned vulnerability to HIV and AIDS infection within the South African context. Furthermore, this chapter contextualises the relevance and need for microbicides,

making suggestion that there is a need for extensive research to be conducted pertaining to women's preferences, attitudes and perceptions towards microbicides.

Chapter Two provides literature related to the research focus. Firstly, this section provides an overview of HIV and AIDS in South Africa, highlighting factors that endorse and foster women's vulnerability to HIV infection. After having set the background of HIV and AIDS in South Africa, this section then examines key factors contributing to women being more vulnerable to HIV infection; these include; biological, social, cultural and economic factors. Thereafter, having presented evidence of factors that contribute to the disproportionate burden women carry regarding HIV prevalence rates, this section briefly discusses HIV prevention methods that are currently available for women. Microbicides are then presented as a possible means that can equip women to protecting themselves against HIV and AIDS. Lastly, limitations of microbicides as HIV prevention methods for women are evaluated.

Chapter Three presents the theoretical perspectives that underpin this study. Acknowledging the contextual setting in which health communications emerge, the Culture-Centred Approach is discussed with the intention of explaining and substantiating the research premise. With regard to the role of culture highlighted as central not only to health communication but also to health development initiatives such as the possible introduction of microbicides. It is argued here that communication about health issues cannot isolate culture, but rather they must be culture-sensitive. Culture is where people's values, beliefs and perspectives are largely informed and shaped. The Empowerment theory is also presented as a means of elucidating the concept of microbicides as biomedical tools that empower women to protect them from HIV infection.

Chapter Four focuses on the methodological map for this research. This chapter presents and describes the research paradigms, the research design, the sampling frame, data collection and data analysis procedures. Furthermore this section expounds on how the researcher 'planned' the research approach to comparing student's attitudes, preferences and acceptance levels towards microbicide products. Lastly, this chapter will assess issues of validity, reliability and ethical considerations involved in this research study.

Chapter Five presents and analysis the quantitative data collected through the questionnaires during this research. Data collected through questionnaires is analysed in a descriptive

manner presenting synopsis tables from all the data collected. Key research questions are addressed alongside the findings, and lastly a brief conclusion is provided. This section then forms the basis of the next chapter;

Chapter Six, presents and analysis all the qualitative data collected through the focus group sessions. The data is presented according to the themes that emerged, then analysed and discussed in relation to the subject matter of this study. This chapter concludes by presenting a major summary of findings from both qualitative and quantitative data.

Lastly, *Chapter Seven* presents conclusions that are based on the research findings, and highlights further research that can be done in line with this study.

Chapter 2: Literature review

Introduction

A considerable body of literature exists concerning HIV prevention. Scholars, epidemiologists, health workers and specialists from various fields have conducted extensive research in the field of HIV prevention, and more recently HIV prevention methods specifically for women. Statistics reveal that women bear a disproportionate burden of HIV infection than men; this is a grave issue as the HIV and AIDS epidemic advances at a steady rate. Without excluding men from the epidemic, this chapter explores literature on (1) women's vulnerability to HIV infection, (2) HIV prevention strategies that are currently available and also (3) possible future strategies for HIV prevention.

The discussion on women's vulnerability to HIV infection and causal factors will set the context for exploring prevention methods that are available, as well as future developments of HIV prevention technologies, such as microbicides. Microbicides are topical biomedical products which are substances that contain antiretroviral drugs. These products are applied in the vagina or applied in the rectal area for the purpose of HIV prevention. Microbicides are not for the purpose of HIV treatment but rather HIV prevention. These biomedical products are partially protective in preventing HIV infection, and may come in a variety of forms; gels, creams, rings or films (Global Campaign for Microbicides, 2015). Currently, microbicide products that show significant HIV risk reduction include; the tenofovir gel and the dapivirine ring (AVAC, 2015).

HIV prevention methods for women are limited, and therefore the development of microbicides as a female mechanism for HIV prevention is a significant milestone. Women, who are the most vulnerable to the epidemic, will benefit significantly from such products if microbicides are clinically approved and become available. Previous HIV prevention campaigns have taught experts the importance of designing interventions that are context specific, this suggests that the introduction of microbicides in South Africa must be studied within the Southern Africa context. Therefore, literature on the introduction of microbicides in Africa and specifically in South Africa will be explored, looking at African responses to these biomedical products. When discussing such significant advances in HIV prevention, it becomes clear that we have entered a new age in HIV prevention technologies, where women

have the means of protecting themselves against HIV infection without relying on their male partners. These developments in the field of HIV prevention have momentous advantages but also present limitations and problems that cannot be ignored, these will also be discussed. Microbicides have attracted a large number of critiques which cannot be ignored when reviewing literature.

HIV and AIDS- Around the globe

It has been three decades since the first diagnosis of HIV in the world, and the virus which was reported in isolated areas has spread to almost every part of the world. With a lack of understanding about the virus and its dynamics, initially experts struggled to come to grips with the cause and effects of HIV and AIDS. Initially, there was a dearth of literature and understanding pertaining to HIV and AIDS. When the virus was first discovered, the transmission and epidemiology of what first seemed to be a disease (and not a virus) was obscured by beliefs that HIV and AIDS was a gay-related disease (Abdool Karim, 2005; Lawson, 2008).

The spread of HIV and AIDS on a global scale depicts the extraordinary lack of understanding about this virus; many communities around the globe did not know how to address HIV and AIDS as a medical and socio-economic problem. To illustrate this point, Hankins et al. (2009) established in their paper that more than 25 million people had died because of HIV and AIDS related diseases and, at the end of 2004, 39.4 million people were living with HIV (Beck and Mays, 2006; Rohleder et al., 2009). Unlike other epidemics, the HIV and AIDS epidemic continues to spread despite concerted efforts towards alleviation (Beck and Mays, 2006). This global scale indicates that addressing HIV and AIDS is a complex phenomenon that goes beyond a lack of knowledge and information. This calls for HIV prevention strategies that will be holistic and specifically designed to bring relief to specific locations, particularly those that are most vulnerable.

The most affected regions in the world by the HIV and AIDS epidemic include Southern Africa[7], these regions have proven over the past three decades to be the epicentre of HIV and AIDS by presenting prevalence rates that are higher than other region in the world (Hankins

[7] Defined here as including eight countries: Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe.

et al., 2009; Rohleder et al., 2009; Ndinga-Muvumba, 2008). Within the Sub-Saharan regions, South Africa in particular is one of the countries most hard hit by the HIV and AIDS epidemic (Rohleder et al., 2009).

HIV and AIDS in South Africa

Although HIV incidence rates have decreased, HIV remains a serious public health problem in some countries. Worldwide, South Africa has proven to have one of the highest numbers of HIV infected individuals, with 6.4 million people reported to be living with HIV and AIDS in 2012 (Shisana et al., 2012). When the first case of HIV was discovered in South Africa in 1983, HIV and AIDS was misunderstood as being exclusive to homosexual males and was referred to as "GRID"; gay-related immunodeficiency disease (Lawson, 2008; Abdool Karim, 2005). However, between 1990 and 1994, it became clear that HIV was not exclusively 'gay-related' (Abdool Karim, 2005). HIV and AIDS began to be referred to as a predominantly heterosexual disease: the number of heterosexual males that were discovered to be HIV positive far exceeded the number of HIV positive homosexual males.

Significantly, it has become evident that women are far more vulnerable to HIV infection than men; statistics reveal that women are disproportionally infected and affected by HIV. In 2002, among males between the ages of 20-24 there was an 8 % HIV prevalence rate and a 17% for females respectively (Human Sciences Research Council, 2002). In 2005, the prevalence rate for males in the age group 20-24 was 6 % and 23% for females respectively (Shisana et al., 2005). These statistics reveal that there is an inordinate difference in the HIV prevalence rates between males and females. Females are more burdened by HIV than men, leading to the notion that females are the most vulnerable to the HIV epidemic. Women have been more susceptible to HIV infection than men for over a decade in South Africa. In 2008 prevalence rates among males in the age group 25-29 was 15.7% and 32.7 % for females respectively (Human Sciences Research Council, 2008). In 2012 prevalence rates among males in the age group 25-29 was 16.8% and 25.5 % for females respectively (Shisana et al., 2012). Female vulnerability to HIV infection is subject to biological factors and various socio-economic factors as well, that give rise to unsafe sexual practices among females. Women from all age groups are more susceptible to HIV infection; however, women in the age groups of 20-24 have proven to be the most vulnerable to HIV infection.

According to Shisana et al. (2012), KwaZulu-Natal has the highest HIV prevalence rates, with KZN at 16.9% HIV prevalence rate as opposed to the lowest prevalence rates in the Western Cape which are 5%. This significant difference between provinces is due to various social, economic and contextual influences. KZN has 8 of the 10 districts that have the highest HIV prevalence in the country, making KZN the hub of HIV in South Africa. Women in particular are more vulnerable to HIV infection for biological reasons.

Biologically, women are more vulnerable to HIV infection due to the large mucosal surface area of the female genital tract which is exposed to infected inocula during unprotected sexual intercourse, and women have a higher semen viral load (Chersich and Rees, 2008; Ramjee, 2011). Several sources present evidence that the risk of HIV infection can also be linked to different levels of the reproductive hormones oestrogen and progesterone (Chersich and Rees, 2008). In addition to biological factors that fortify women's vulnerability, are cultural mores that limit their ability to negotiate safer sexual practices with their male partners (Ramjee, 2011). Ackermann and de Klerk (2002) explore the dynamic social factors that influence women's vulnerability to HIV infection. There is an evident need to focus on HIV prevention methods that are designed to reduce women's vulnerability to the HIV epidemic and empower women to have autonomy over their bodies and sexual health. This makes it paramount to first know and understand the causal factors that contribute to women's vulnerability to HIV infection.

Women's vulnerability to HIV and AIDS

HIV and AIDS has exposed social and cultural problems that are portrayed by the disproportionate HIV burden that women bear. In the following quote, Tallis (2012: 17) encapsulates the impact of the virus: "AIDS moves far beyond being simply a 'disease', necessitating more than a public health response…demanding our responses to be up to the challenges posed, beyond a simple health approach and to address multiple and complex inequalities". In the light of Tallis' argument, HIV and AIDS is an epidemic that cannot be dealt with on an individual level, by simply addressing individualistic problems concerning vulnerability to HIV, but rather it is an epidemic that requires an interdisciplinary and holistic approach because it is not simply a "disease", it is a complex social problem. Several factors

have contributed to the escalated HIV and AIDS epidemic which has seen women bear a disproportionate burden of infection.

Social factors that influence women's vulnerability to HIV and AIDS

There are several elements that contribute to social factors which influence women's vulnerability to HIV infection. Gender-based violence (GBV) refers to violence that is inflicted on a person because of their gender and expectations of his or her role in society or culture. Within the South African context, GBV is recognized as a major social problem that has significant influence on HIV prevalence rates (Gerntholtz and Grant, 2010; Ackermann and de Kerk, 2010). Violence against women (VAW) across all ages is a growing social problem and this has detrimental consequences for women's ability to protect themselves again HIV infection (Tallis, 2012).

Despite the fact that there have been advances in sexual and domestic violence legislation, South Africa still has very high levels of VAW and also the highest rape statistics in the world (Tallis, 2012). Rape is a form of gender based violence that is directly linked to the transmission of HIV (Ackermann and de Kerk, 2010). Rape refers to forced or coerced sex which results usually in vaginal or anal tearing or bruising (Tallis, 2012). These are major social problems that South African women face: the exposure to this form of abuse is evident in the disproportional HIV prevalence rates between men and women.

Research indicates that South Africa has the highest prevalence of reported rape cases, when compared with other countries (Jewkes, 2009). Increasingly, the relationship between violence against women and HIV infection is being recognized, and this includes: forced or coerced sex, which is likely to cause vaginal or anal tearing and therefore increases the risk of contracting a STI or HIV (Tallis, 2012). This social problem cannot be ignored when designing and implementing HIV prevention methods or strategies as GBV has significant contribution to HIV prevalence rates that cannot be ignored.

The links between VAW and HIV are dynamic and complex; what can be established however, is that both of these concepts are entrenched in social interactions. Both HIV and VAW are embedded in social attitudes towards gender, they are influenced by a complex

interplay of a) discriminatory values, norms, behaviors and practices; b) different exposures to diseases, and injuries; c) biases in health systems; d) biased health research (Sen and Ostlin, 2007). The diagram below is a summary of these relationships:

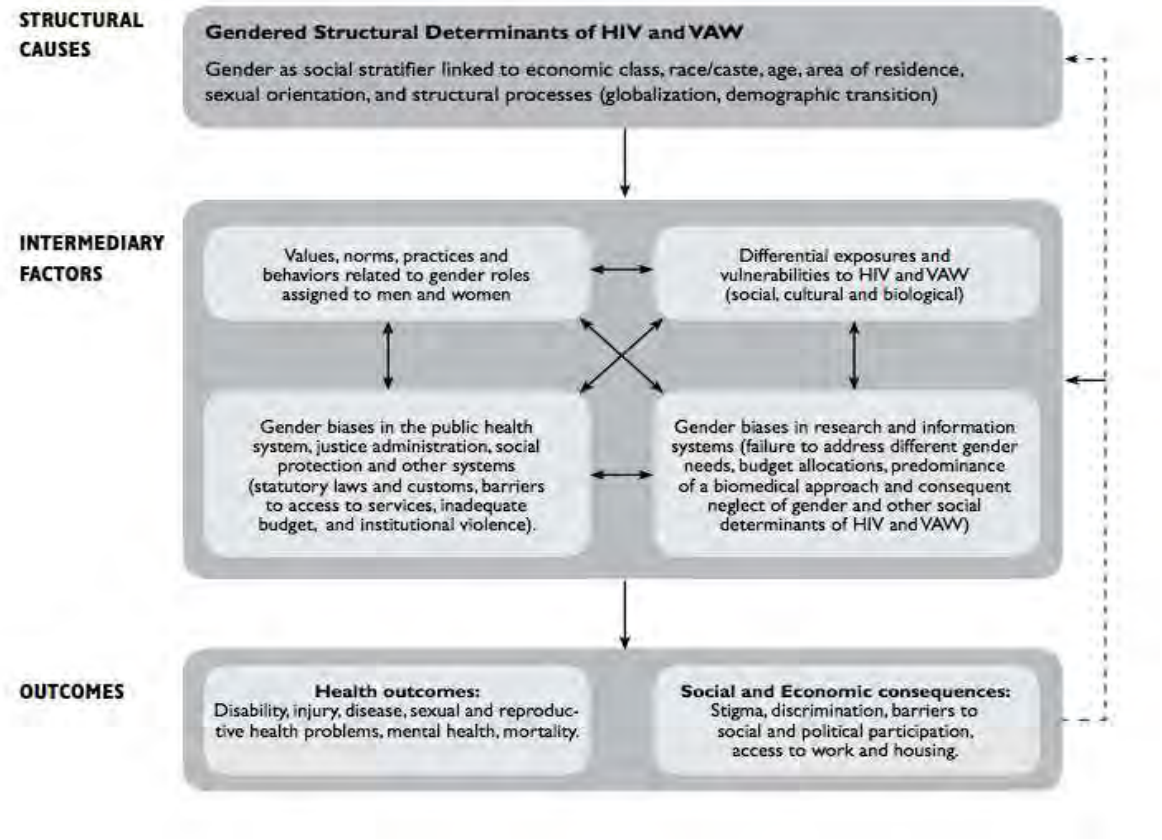

Figure 2-1: Conceptual framework for analysing linkages between HIV and VAW causes, intermediary factors and outcomes/consequences[8]

It is estimated that one in six women are in an abusive relationship in South Africa (Peterson, 2009). GBV is a strong variable influencing women's vulnerability to HIV infection. Research conducted by Dunkle et al. (2004) suggests that there is a greater chance for women to become infected with HIV when they are in a relationship that is marked by gender power inequality and who experience sexual violence. This research was conducted with women between the ages of 16-44 years, who were in antenatal care in Soweto (Dunkle et al., 2004). This study established that 21.8 percent of women attending the antenatal clinic experience gender based violence and made the strong suggestion that violence during pregnancy is common (Dunkle et al., 2004). Therefore, it is evident that women who experience rape or any other form of gender-based violence do not necessarily experience abuse from a stranger, but rather women are abused and raped by their partners.

[8] Sen,G, Piroska,O, Asha, G: *Unequal, Unfair, Ineffective and Inefficient – Gender Inequity in Health: Why it exists and how we can change it.* Women and Gender Equity Knowledge Network. 2007.

The myth that having sex with a virgin is a cure for HIV results in an increase of rape cases in South Africa (Tallis, 2012). According to the "virgin cleansing myth", a man can cure himself of HIV or AIDS by engaging in sexual intercourse with a girl or woman who is a virgin (Leclerc-Madlala, 2002). According to the virgin cleansing myth, a man can cleanse his blood from HIV or AIDS through sexual intercourse with a virgin, but the girl during this process will not be infected (Leclerc-Madlala, 2002). Consequently, South Africa has witnessed an immense rise in rape cases because of beliefs such as this myth of curing HIV or AIDS through intercourse with a virgin. It is these types of myths that add to the vulnerabilities of women, making HIV more complex than just a higher biological exposure to the virus.

The fear of violence can promote silence from women about rape, leading to a greater epidemic. Ackermann and de Klerk (2002) highlight in their work that violence in intimate relationships occurs more often than we think, but in many relationships this abuse occurs so often that it is perceived as a norm and is accepted by women rather than challenged. Whether rape is inflicted by a partner or a stranger, this form of abuse increases the risk of HIV infection. Women lose authority over their own bodies when they are exposed to GBV, particularly when women base their sexual behavior and attitudes on 'convictions' that they should be submissive to men (Peterson, 2009). HIV and AIDS has revealed the need to scrutinize and question issues of gender relations, issues which fuel and promote GBV in sexual relationships (Tallis, 2012).

Socially constructed terms such as masculinity and femininity are complex notions which have exacerbated GBV in the South African context (Tallis, 2012). Ackermann and de Kerk (2010) review a study that was conducted in Khayelitsha in the Western Cape which revealed that 30% of young girls' first sexual encounter was forced. This study also established that violence in relationships usually occurs at the beginning of the relationship, yet the relationship continues (Ackermann and de Kerk, 2010). These findings reveal that issues of gender relations are complex: this is established by the notion that even in abusive relationships, there are women who choose to remain with their abusive partners and consequently remain victims of abuse. Negotiating safe sex practices in these conditions becomes a great challenge for women and consequently, rarely transpires. HIV prevention

methods and technologies need to take these social factors into consideration when designing and developing new products or campaigns for women.

Cultural factors that influence women's vulnerability to HIV and AIDS

There is a growing need for cultural conditions to be valued in the field of HIV prevention. Cultural practices play a central role in people's values and choices, and in particular, people's choices in safe sex practices or the lack thereof (Peterson, 2009). Culture is a dynamic concept which, as a set of values and practices, influences people's behavior. Thus, when studying a manifestation that involves individuals, it becomes necessary to also look at their cultural context in order to have an informed understanding of their decisions. Within the field of HIV and AIDS, it is crucial that the concept of culture is explored and studied so that we can come to understand how culture can influence the vulnerability of women to HIV infection.

Cultural practices and attitudes have a significant role in the vulnerability of women regarding HIV infection, in that they shape and instruct women's perceptions of and attitudes towards sex (Peterson, 2009). Therefore, there is a need to look at what practices promote the transmission of HIV in order to develop HIV prevention strategies that are relevant and efficient. The goal of designing HIV prevention technologies that are relevant lies in ensuring that these methods are better attuned to the cultural practices of people in a particular context.

Within the South African context, gender disparities are at the center of social factors that make women vulnerable to HIV acquisition. Gender is a socially constructed concept; it is what society expects from female and male behavior. It is a social phenomenon where males are expected to behave in a particular manner and also females are expected to behave in a particular manner (Gupta, 2000). What is meant, then, by gender disparities are that there is an imbalance or rather, lack of equality between males and females resulting in a disproportional distribution and access to health resources. Gupta (2000) explores the issue of gender and HIV extensively in a paper delivered at the XIII'th AIDS conference. Here, gender is explained to be a culture-specific construct that signifies what men and women can and cannot do. This highlights the landscape in which HIV prevention methods for women are most needed: there is a pivotal need to develop techniques and technologies that will

close these gender disparities by empowering women to protect themselves against HIV infection.

The World Health Organization (WHO) defines gender as being a socially constructed term that gives appropriate roles, behaviors, activities and attributes to men and women. An example of gender roles would be that men are expected to take control in sexual interactions with their partners while women take on a more submissive role. These gender dynamics can become problematic because women are expected to know less about sexual practices than their male partners, resulting in women being vulnerable to HIV infection as they do not negotiate safer sexual practices with their partners. In many communities, women are encouraged to be ignorant about issues pertaining to sexual intercourse, with society dictating that "good" women are passive in sexual intercourse (Abdool Karim, 2005; Gupta, 2000). These social norms are dangerous to the wellbeing of women's sexual health because they discourage openly discussing sex, even in women who are sexually abused.

Abdool Karim (2005) who is renowned internationally for his substantive contributions to the field of HIV prevention, boldly states that any response to the HIV epidemic that does not take into account gender issues, is unlikely to succeed. This is because any HIV prevention strategy that does not explore contextual issues will be limited in its effect because people live in societies that influence behavior and choices. Further, Abdool Karim and Frohlich (2000) make the suggestion that women need to understand their rights in relation to sex and reproduction and the issue of health services needs to be addressed in order for HIV prevention methods to be effective. Indeed, agency must come from those who are on the receiving end of HIV prevention methods: women need to come to an understanding of their rights and take the initiative in their sexual health.

Specialists from the biomedical sector recognize the social issues in addressing this evolving epidemic: it is obvious that there is no independent solution to curbing the spread of HIV but rather through the interplay of various prevention methods, this epidemic can be reduced. Furthermore, it is becoming clear that in order for the HIV virus to be curbed there is a need for a collective response, as illustrated by the following quote. "…as scholars, activists, programmers and policy makers..., we have a duty to ensure that our responses to this pandemic translate into tangible action to curb this virus." (Reddy, 2012 quoted in Tallis (2012: X).

There is a requirement for collective action to be taken, therefore not only do women need to be agents in ending their vulnerability to HIV infection, there is also a fundamental need for a collaboration between different parties to curb HIV prevalence rates. In addition there is a need to locate our understanding of the HIV epidemic within the framework of cultural and social contexts.

Economic factors that contribute to women's vulnerability

Economic factors which exacerbate the HIV and AIDS epidemic are broad and complex; however, for the purpose of this study we examine this factor briefly. There is growing evidence that there is a direct link between one's economic status and one's vulnerability to HIV infection. Literature has led to the understanding that poverty is seen as a driver for the likelihood of a person engaging in risky sexual behavior (Rohleder et al., 2009). Particularly, poverty is emerging as a one of the key economic drivers that aid the vulnerability of women to HIV infection (Abdool Karim, 2005). This understanding emerges from the notion that when people are faced with needs i.e. financial needs, they will do anything it takes to address this need, even engaging in risky sexual behavior (Rohleder et al., 2009).

Ackermann and de Kerk (2010) highlight in their paper how women are made vulnerable to HIV infection through economic instability, and this unfolds in various ways with different women. Because some women lack formal education they face the disadvantage of not being able to work and receive a salary to support themselves and their families. Not only do women face vulnerabilities in the labor market because of their lack of education but they also face having to raise children and head a family with no male partner to assist them (Ackermann and de Kerk, 2010).

It is estimated that 31% of homes in rural and urban areas in Africa are supported financially by women with no male assistance (Ackermann and de Kerk, 2010). These facts increase pressure on women to have an income, and in contexts where women cannot find jobs or are in low paying jobs, they enter relationships with men with the intention to receive financial assistance (Ackermann and de Kerk, 2010). The financial challenges that women face vary, this is not to say that what has been highlighted in this study applies to all women who are economically disadvantaged. Ige and Quinlan (2012) bring across a point that when women enter relationships of this nature they are at higher risk of STDs including HIV because these

relationships are usually open sexual networks with numerous channels for transmission. Abdool Karim (2005) also states that poverty is becoming a root cause of female vulnerability to HIV infection because many women are pressured to use sex as a commodity.

Transactional sex

> *Transactional sex is increasingly understood as a response to modernity and to economic stress, and as a boost for HIV transmission. HIV, gender and transactional sex are linked in many ways: dependent women have less say in safer sex and are less able to insist on condom use; richer men are usually older men, and older men are likely to be infected with HIV.* (Lawson, 2008: 169)

Poverty is slowly becoming recognized as a key driver of HIV infection, particularly for women (Rohleder et al., 2009). Sexual relationships are as complex as the context in which they occur; financial instability is one of the many dynamics that can bring about explicit power imbalance in sexual relationships. According to research, women who are financially dependent on males can find themselves in a situation in which they are vulnerable to sexual abuse (Dunkle et al., 2004). When women depend on their male partners for financial support they are more likely to tolerate abuse from their partners as well as unfaithfulness, and this places them in vulnerable positions. Dunkle, et al (2004), established the understanding that in some contexts, males who financially supported their female partners or provided them with gifts were more likely to have multiple concurrent partners (Dunkle et al., 2004).

Women who are exposed to poverty are the most vulnerable to HIV infection because of their gender and also their economic status: they are at a point of double jeopardy. Economic instability is one of the critical factors contributing to vulnerability to HIV infection, particularly among women. Kelly and Parker (2000), reported as follows from their investigations conducted in six sites across South Africa: among females in the 15-19 year age range, those from economically deprived homes were twice as likely to have has sexual intercourse than those from economically stable or wealthy families. Through this study it was discovered that there is a strong correlation between poverty and increased sexual intercourse among youth: this is due to the fact that exchange of sex for material and financial gain informs young people's sexual decision making (Kelly and Parker, 2000).

Quarry and Ramírez (2009) explain this notion in their book by looking at "Sugar Daddies in Kenya", where young school girls are lured into sexual relationships in exchange for money, cellphones and automobile rides. These girls engage in risky sexual practices with older men despite being aware of the dangers involved and the risk of sexually transmitted diseases to which they may be exposing themselves. Quarry and Ramírez (2009) state that in this context, messages about abstinence would "fall on deaf ears". Understanding the contexts in which risky sexual practices take place is therefore crucial in health communication strategies. An understanding of transactional sex is crucial for the development of relevant strategies to curb the HIV epidemic successfully.

In a study entitled "Transactional Sex and the Pursuit of Modernity" by Leclerc-Madlala (2003), it was discovered that, in the context in which the study was conducted, the common understanding was that sex is a valuable commodity that required "payment". The exchange element of sex was implicit, ranging from receiving money to receiving favors (Leclerc-Madlala, 2003). Women expected men to display appreciation for having enjoyed sexual encounters by giving gifts, money, favors, account payments, food items and so forth (Leclerc-Madlala, 2003). This study also highlighted the fact that while some women are involved in transactional sex for "survival purposes", others are involved in transactional sex for a higher status in society. It was evident in this study that knowledge about HIV transmission and prevention methods did not imply a willingness to change behavior. Despite knowledge about HIV and AIDS in South Africa and several educational programs on HIV and sexual behavior, there still are escalating statistics of HIV rates because sexual behavior is a complex phenomenon. This calls for more research on sexual behavior and its link to epidemiology

Further, within the South African context, research has established a link between transactional sex and multiple concurrent partners (Leclerc-Madlala, 2003; Hunter, 2002; Luke and Kurz, 2002). Women who are in transactional sexual relationships usually have more than one sexual partner. In these instances, the women would be in multiple relationships where one partner provides groceries, and another pays for clothes and so forth (Dunkle et al., 2004). Ige and Quinlan (2012) highlight this aspect of MCPs in their work, noting that females in other cultural contexts engage in commercial and transactional sex because of their poor economic conditions. Here, the issue of women engaging in risky

sexual behaviors such as MCPs is explored and the authors note that poverty drives many women to engage in unprotected sex in exchange for money (Ige and Quinlan, 2012; Tallis, 2012). Poverty also supports the cultural practice (usually in African contexts) of marrying young girls to older men, where families negotiate to marry young daughters to older men for economic gain (Ige and Quinlan, 2012). This increases the vulnerability of young girls who enter into marriages with older men, as the men may already be HIV positive or may have MCPs. Tallis (2012) articulates that there is a lack of control by poor women over their own sexual health and the circumstances under which they engage in sexual activity.

The circular migration of men, who work in cities leaving their wives in rural areas, is another economic factor fueling HIV vulnerability among women. Circular migration is popular in South Africa, when men go to work in the cities: they have 'town wives' while maintaining their children and wives in rural areas simultaneously (Abdool Karim, 2005). This situation then places the wives in the rural areas in vulnerable and insecure positions because when their husbands come back from the cities, they may come back HIV positive. Lawson (2008), highlights that epidemiologists have argued that South Africa's historical migrant labor system has caused the HIV infection rates to escalate, causing a ripple effect that still can be identified in today's society. However, even though migrant labor has been a major factor contributing to the HIV epidemic, it cannot be credited as the sole driving force behind the alarming HIV prevalence rates.

Biological factors that contribute to women's vulnerability

The disproportionate cases of HIV infection among women compared to men is a cause for national concern and it cannot be emphasized enough how crucial it is for HIV prevention strategies to take into consideration these causal factors. Age, mode of transmission, sexually transmitted diseases (STD) infection and anatomy are just a few determining physiological factors that make women vulnerable to HIV acquisition. Biologically, women are more susceptible to HIV infection than men and even though more extensive research is needed to explain this occurrence, epidemiologists offer explanations from their research of how the physiology of women makes them vulnerable to HIV infection.

Firstly, it is said that women are more susceptible to STDs because they have a greater mucosal surface exposure to pathogens during sexual intercourse, making women three times more likely to become infected with HIV during sexual intercourse with someone who is HIV positive compared to men (Ackermann and de Kerk, 2010; Ige and Quinlan, 2012).

Secondly, the vaginal walls are sensitive and the slightest abrasion (which can occur with ease) can cause pathways for HIV transmission. This process is more complex than the explanation offered in this study but in keeping with this research, it is essential to highlight this biological factor that makes women vulnerable to HIV infection (Ige and Quinlan, 2012). Thirdly, the age in which sexual intercourse for women occur influences vulnerability to infection because younger women have a genital tract that is not mature, making it more sensitive to damage. Also, it is not easy to detect sexually transmitted diseases; in females: there are many women who are not aware that they have STD's, and this makes them more vulnerable to HIV infection during unsafe sexual intercourse (Ackermann and de Kerk, 2010; Ige and Quinlan, 2012). More research and understanding of the female genital tract is very important in order to guide future developments in HIV prevention methods that can help women protect themselves.

HIV prevention in the 21st century

In the past three decades, HIV prevention research has evolved. HIV transmission has predominantly occurred through heterosexual transmission, and it can be argued that sexual behavior is the leading driver of HIV transmission in South Africa (Shelton et al., 2004). South Africa has seen a continuous transition in HIV prevention methods, from focusing on individual level of HIV prevention to interpersonal and community level (Bhana and Peterson, 2009). The Abstinence, Be faithful and use a Condom (ABC) approach, is one of the major behavioral change interventions for HIV prevention. The ABC approach advocates that in order for people to protect themselves from HIV infection they must abstain from sex, if they cannot abstain from sex, they must be faithful to their sexual partner, and if they cannot be faithful then they ought to use a condom for every sexual encounter (Shelton et al., 2004).

The ABC approach addresses individual behavior issues in order to reduce the chances of HIV infection. South Africa in particular has implemented HIV prevention methods and intervention that have primarily targeted the individual (Bhana and Peterson, 2009). Even though individual level HIV prevention interventions have shown good results, they have to a large extent demonstrated limited results in influencing people's sexual behavior (Bhana and Peterson, 2009). A considerable number of people still engage in risky sexual behavior, irrespective of educational programs about the dangers of sexual behavior. Moodley (2007) highlights in her work that the ABC approach is not an accurate reflection of the sexual behavior of the youth: the youth of South Africa are not practicing abstinence from sex, limited number of sexual partners nor ensuring consistent use of a condom during sexual encounters. This is where evidence of the limitations of individual level interventions becomes obvious.

Female condom- women empowerment?

In 1996 the female condom was introduced as a new method of prevention against HIV infection (Tallis, 2012). The female condom is a barrier method of prevention against HIV and it is worn by the female, blocking semen and other bodily fluids during sexual intercourse (Gollub, 2000). Initially the female condom was introduced as a method that will aid women in protecting themselves against sexually transmitted diseases; however the uptake of the product was limited by costs (Marseille et al., 2001). Female condoms are expensive and many women, especially poor women cannot afford to buy them, making the use of this prevention method challenging for women. In addition, government distribution of the female condom was on a far more lower scale then the distribution of government sponsored male condoms: in South Africa, 5 million female condoms were distributed in 2009 as opposed to 450 million male condoms (Tallis, 2012). Even though the female condom was designed to empower women to take the initiative in protecting themselves against sexually transmitted diseases, the lack of access to these condoms has been a very big challenge and almost defeats the purpose of having a prevention method that women "can control".

There is a need then, to explore what can empower women to protect themselves amidst these biological, cultural and social barriers. There is a growing necessity for HIV prevention technologies that empower women to have autonomy over their bodies and also have control over their sexual health. Tallis (2012) conceptualises vulnerability as a lack of power,

opportunity and ability (skills) to make and enforce decisions that influence one's own life. Tallis (2012) continues to state that the converse of vulnerability is empowerment. The concept of empowerment becomes important then when we explore the issues of women being vulnerable to HIV and AIDS.

PrEP

In 2015 the UNAIDS accepted and welcomed guidelines from the WHO to reduce the transmission of HIV[9]. The guidelines from the WHO promise to fast-track the reduction of HIV prevention, as well as improving the live s of those living with HIV. These included the recommendation of antiretroviral medicines to be given to people as soon as they are diagnosed with HIV (regardless of their CD4 count), more significantly, these recommendations included the endorsement of antiretroviral drugs to be made available for people in high risk populations as PrEP.

In order for HIV prevention methods to be efficient and relevant in various contexts, biomedical innovation in HIV prevention must consider various factors. Biomedical HIV prevention methods include circumcision, developing vaccines, developing microbicides, pre-exposure prophylaxis (PrEP), and suppressive therapy for herpes simplex virus-2 to reduce risks of HIV transmission (Stirratt and Gordon, 2008). PrEP for HIV prevention refers to a prevention method that involves the use of antiretroviral (ARV) medication in order to reduce the risk of HIV infection for those who are HIV negative (2015). Clinical trials indicate that using PrEP on a daily basis reduces the chances of HIV infection in women and men who adhere to the product as directed (Idoko et al., 2015). Current and follow-on clinical trials for PrEP are testing tenofovir-based regimens, using TDF (an antiretroviral containing tenofovir) or FTC (emtricitabine which is sold under the name Truvada) (AVAC, 2015). Adherence to biomedical methods of HIV prevention is very important; the lack of adherence from trial participants may lead to inaccurate and distorted trial results (Stirratt and Gordon, 2008). Because adherence is a key factor in the effectiveness of PrEP, it is crucial that potential users' perceptions and opinions are taken into consideration.

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

A study was conducted in Nigeria with the purpose of investigating public opinion, community level interest and perceptions towards PrEP (Idoko et al., 2015). This formative Nigerian study used a mixed method approach to collect data on people's opinions and perceptions (Idoko et al., 2015). Data collection methods included: telephone and in-depth interviews, focus groups, online surveys and consultative meetings with stakeholders engaged in HIV prevention. Results from this study showed that respondents strongly believed that PrEP would significantly decrease the number of HIV incidents (Idoko et al., 2015). Respondents identified HIV serodiscordant couples (these are relationships where one partner is HIV positive and the other is HIV negative) as appropriate target groups to use PrEP (Idoko et al., 2015). The issue of stigma was identified as a potential barrier to PrEP use and acceptance. People fear being stigmatized; stigma is related to social exclusion, social inequality, and poor adherence to treatment (Tallis, 2012; Idoko et al., 2015; Haire and Kaldo, 2013). Better understanding of people's perceptions and factors influencing adherence will assist in improving adherence and consequently improve effectiveness of the product. Therefore studies such as this are crucial in the development of new HIV prevention technologies.

Although PrEP offers great contributions to alleviating the HIV and AIDS epidemic, these biomedical technologies are accompanied by serious ethical issues. There are areas in which PrEP may have serious ethical implications, and these areas have been discussed by specialists in the HIV prevention field (Rowniak and Portillo, 2013). Firstly, PrEP has the potential of being misinterpreted people; what is meant by this is that people may interpret the introduction of such products as a form of condoning risky sexual behavior (Rowniak and Portillo, 2013). Endorsing PrEP may result in people engaging in more risky sexual behavior, as they would be presented with an option of being protected against HIV infection even when engaging in unprotected sex (Rowniak and Portillo, 2013).

Secondly, the introduction of PrEP could potentially result in an increase of sexually transmitted diseases as people misinterpret the purpose of PrEP and engage in risky sexual behavior (Rowniak and Portillo, 2013). Thirdly, there is serious concern that the use of PrEP will result in drug resistance (Rowniak and Portillo, 2013). For example if a person becomes infected with HIV while still on PrEP, this may result in the antibody response being ineffective and difficult to detect (Rowniak and Portillo, 2013). Fourthly, long term use of PrEP may present with harmful side-effects, and even though clinical trials have indicated the

safety of using PrEP, it is the long term effects that are unknown (Rowniak and Portillo, 2013).

Finally, one of the major ethical issues surrounding PrEP is the question of 'who will have access to these products?', Rowniak and Portillo (2013) state that there are limited healthcare services around the world and in areas where resources are limited, expensive medication such as PrEP will be dedicated to treating people who are infected (Rowniak and Portillo, 2013).

Microbicides

Microbicides refer to substances that are ARV based that could be used to reduce the risk of HIV infection through sexual intercourse (AVAC, 2015). Ramjee (2011), states that these products have shown promising results in clinical trials. Moreover, Ramjee (2011) highlights how significant it would be for a microbicide product to be licenced and available to women because this could mean that there is an HIV prevention method that empowers women in their sexual choices. Microbicides offer women HIV prevention measures which they can control. HIV risk reduction programs (HIV prevention programs) must consider the issue of relationship power that is influenced by gender disparities when designing and implementing programs of this nature (Pulerwitz et al., 2002). Ignoring the often dominant role of men in sexual decisions can prove to be detrimental in curbing the HIV epidemic; there is a need to now design and implement HIV prevention methods that will equip women to make safer sex choices.

Brief history of microbicides

In most sexual relationships, men are in control of sexual practices in the relationship, exercising power as to when and how sex will take place. In 1990, a South African epidemiologist Zene Stein published an article entitled "*HIV Prevention: The Need for Methods Women Can Use*", this was the beginning of advocacy for women-controlled methods of HIV prevention (2015). That same year, this appeal for HIV prevention methods that women can use was heard in a national public forum, at this forum were delegates from the US National Conference on Women (2015). This then lead to the first consultation on

microbicides among HIV and AIDS professionals in 1991 at the Population Council in New York (2015).

By 1992 funding was directed towards research on microbicides. Even though funding was very low, this marked the beginning of advancements towards microbicide research (2015). Research of microbicides has advanced significantly from the early 1990s: in 2009 investments into microbicides was at a high of US $235.7 million (Tallis, 2012). Important to research in microbicides is that resources are directed at the coordination and development of the most promising products (Tallis, 2012). This simply means that research in microbicides is committed to the advancement of the most promising products; the way in which 'promising' products are identified is through pre-clinical and clinical trials (Tallis, 2012). The importance of these clinical trials is that they test safety and effectiveness of the microbicide products.

Clinical trials

Phase I clinical trials are carried out with a small group of participants who have been recruited on a voluntary basis (Tallis, 2012; Lesch et al., 2009). This small group of participants usually consists of ten to fifteen women. At this phase of clinical trials, the issue is safety and acceptability of the product to those who are using it (Tallis, 2012; Lesch et al., 2009). Phase I in clinical trials can be seen as an initial stage in the development of microbicides and this is why at this phase, the trial does not recruit a large number of participants. Phase II clinical trials further assess safety and acceptability of the microbicide by participants. During this phase, there is a larger in-take of female participants (hundreds) who are 'potentially' at risk of HIV infection (Tallis, 2012; Lesch et al., 2009). In Phase III of clinical trials, there is an even greater in-take of female participants (from hundreds to thousands); the purpose for this phase of clinical trials is to examine the safety of long-term use and efficacy of the products (Tallis, 2012; Lesch et al., 2009). Not many microbicide products have made it to Phase III of clinical trials. Here is a simplified diagram[10] of the different phases in clinical trials:

[10] Eshetie S. (2013) Microbicide drug candidates: A New hope for HIV prevention. . Ethiopia: UNIVERSITY OF GONDAR COLLEGE OF MEDCINE & HEALTH SCIENCES SCHOOL OF BIOMEDICAL & LABORATORY SCIENCES DEPARTMENT OF MEDICAL MICROBIOLOGY.

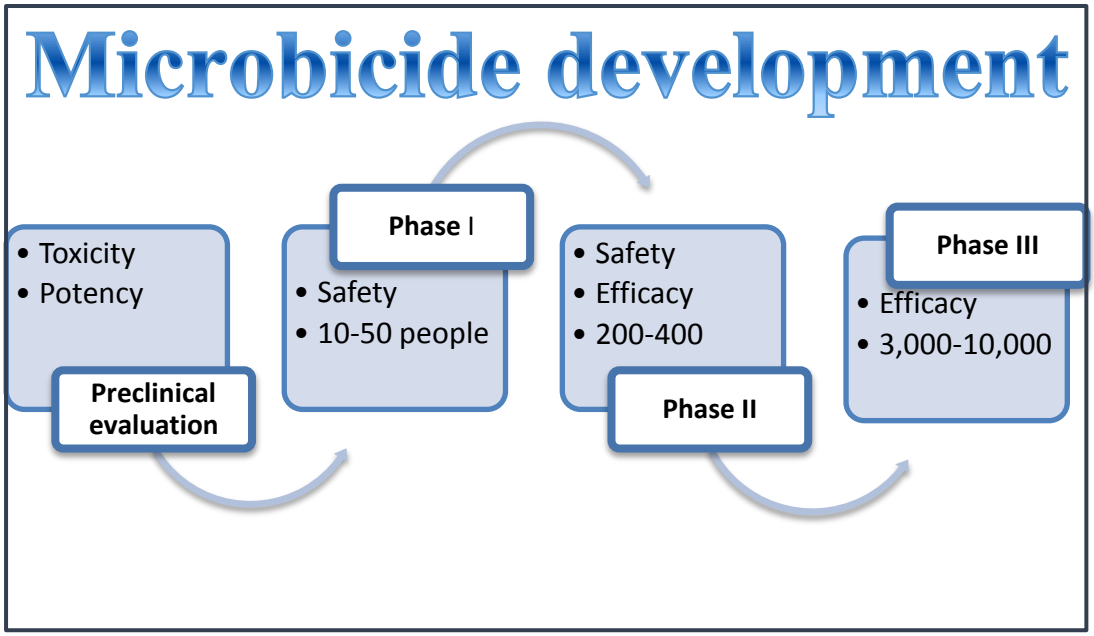

Figure 2-2: Phases in microbicide clinical trials.

Success in microbicides

Microbicides could come in a number of forms: creams, gels, films and vaginal rings that release the active ingredient over a varying period of time (AVAC, 2015). Currently, the only microbicide products that show significant HIV risk reduction are; the tenofovir gel and the dapivirine ring (AVAC, 2015). The tenofovir gel is a vaginal gel with 1 % tenofovir, which is an ARV drug (CAPRISA, 2010) This gel works by preventing the HIV virus from reproducing itself in susceptible cells (CAPRISA, 2010). Importantly, the application method of the tenofovir gel the CAPRISA 004 before and after dosing strategy is referred to as BAT-24. The gel is applied 12 hours before anticipated sexual intercourse and within the next 12 hours after sexual intercourse, with a maximum of two doses within a 24 hour period (CAPRISA, 2010).

The CAPRISA 004 was a phase IIb clinical trial where the tenofovir gel underwent clinical trials in South Africa from 2007 until 2009 (CAPRISA, 2010). The results for this trial revealed that the tenofovir gel reduced women's risk of HIV by 39%, and a 51% lower risk of genital herpes (CAPRISA, 2010). Further trials are being done to verify the findings of CAPRISA 004, these are: the VOICE trial, FACT 001 trial, MTN 017 trial and CAPRISA 008 trial[11] (AVAC, 2015). With regard to VOICE – Vaginal and Oral Interventions to

Control the Epidemic - clinical trials are being conducted at 15 trial sites in Uganda, South Africa and Zimbabwe that have enrolled 5,029 sexually active HIV-negative women. The trial is being conducted by the Microbicide Trials Network (MTN), an HIV AND AIDS clinical trials network funded by NIAID with co-funding from the Eunice Kennedy Shriver (MTN, 2011). FACT 001 is a large scale trial of the tenofovir gel conducted among South African women. It was launched in October 2011 and planned to enrol approximately 3000 women: results are expected late in 2014 (AVAC, 2015). MTN 017 is the first expanded safety study of a rectal microbicide candidate. It will enrol 168 men who have sex with men at sites in Peru, South Africa, Thailand and the United States. Results are expected in June 2014 (AVAC, 2015). CAPRISA 008 is designed to give access to the gel to the CAPRISA 004 HIV negative participants, for further safety data and to see how the product can be improved (AVAC, 2015).

The dapivirine ring is different from the tenofovir gel in product type and application, even though it is a microbicide product. The vaginal ring is made of flexible silicone that fits inside the vagina, defusing the dapivirine ARV drug over a period of four weeks (AVAC, 2015). Two current trials are evaluating the ring's safety and effectiveness of reducing HIV infection risk: ASPIRE (MTN 020 trial) which is sponsored by Microbicide Trial Network (MTN) and The Ring Study (IPM 027) which is sponsored by International Partnership for Microbicide (IMP). ASPIRE phase III trial of the dapivirine vaginal ring has recently completed the enrolment of 2629 women: these women were enrolled for this trial from 15 clinical research sites from South Africa, Malawi, Uganda, and Zimbabwe.

Through clinical trials, microbicides could prove to be the most effective tool that women can use to protect themselves from HIV, and through these products, women can gain a sense of autonomy over their bodies as well as a sense of empowerment over their health. The study done by Ramjee (2011) emphasises the great need for research to be done on women's attitudes and possible acceptance levels of microbicide products, the study highlights a gap in research of what women's attitudes towards such products may be, and what informs these attitudes. Acceptability of microbicide use will also be determined by many interconnected factors such as country-setting, ethnic group, education level, gender, age and socio-economic group (Ramjee, 2011). According to Durden (2011), even though the development

of the tenofovir gel has offered a biomedical solution to HIV infection, it is acknowledged that the need for the gel must be based in understanding social dynamics that give rise to the HIV epidemic. Tallis (2012), also advocates the notion that there is a great need for research to be done on the accessibility and acceptance by women of microbicides.

Tallis (2012) states that acceptability is a complex concept that will be influenced by a complex interplay between (1) women who need the product, (2) the microbicide product, and (3) service delivery. These are important influences in the acceptance of microbicides but it is arguable that there are more factors that will inform acceptability of microbicides such as culture and social context. Because women are not just independent entities in society, rather the context and space in which one is embedded influence the behavior and lived experience of an individual. The choice of which microbicides to use will vary according women's personal preferences, the nature of their relationships and intentions for pregnancy (Tallis, 2012).

Some women may prefer to use the dapivirine ring as opposed to the tenofovir gel because it does not demand daily application, making adherence a simple task, whereas some women may find the BAT24 application strategy of the tenofovir gel more reliable. Another possible attraction of using the tenofovir gel would be that it can be used more discreetly, without the male partner knowing that their female partner is using this microbicide. It is very important that microbicides are acceptable and accessible to women and men who will use these products, it is therefore important to have research on acceptability of microbicides in contexts where they will be used. It is crucial that the tenofovir gel is used consistently for every sexual sex encounter: this ensures effectiveness of the product in protecting against HIV.

Figure 2-3: ***Tenofovir gel***

Figure 2-4: ***Dapivirine Ring***

Acceptability of microbicides in Africa

In 2005, a qualitative study was conducted in Ghana to explore the factors that influence acceptability and utilization of vaginal microbicides for HIV prevention in women (Tanner, 2008). The purpose of this study was to explore and assess the perceptions of reproductive healthcare professionals and women and men from the community regarding acceptability and utilization of microbicide products. The results of this study were categorized within the three main topics that came up during interviews and focus groups (1) Available contraceptive and prevention methods. Here, the main complaint about available contraceptives whether pills or injections was that they had side effects and in the focus group session, both men and women recounted their dislike of using a condom for contraceptive and prevention methods. One respondent stated "Sometimes it just hurts, you just get dry and it hurts"(Tanner, 2008: : 5). Therefore, acceptability of microbicide products will be influenced by side effects that these products may cause in women who use them. A nurse also had input to say that many people believe that condoms detracted from feeling and the female condom also had similar reactions. In this context then, condoms as an HIV prevention method and as a contraceptive have not been accepted by many men and women because of the misconceptions attached to condom use (Tanner, 2008).

Furthermore, microbicide interest and acceptability; both male and female participants suggested that Ghanian women would likely have high levels of acceptance towards microbicide products, with varying interests in the characteristics of a microbicide products (contraceptive properties, application procedure of products etc). There were various opinions with regards to timing of applying the microbicide products, with some women stating that it would be impossible to use this product without their partner knowing about it. This indicates that some women would want to use microbicide products secretly (Tanner, 2008). In addition, the focus group respondents expressed the fact that the lubricating properties that microbicides could have would be appreciated compared to using condoms (Tanner, 2008). The fact that men and women are stating that they would use microbicides as an alternative to condoms could prove to be problematic because microbicide products are not a 100 percent effective method to prevent HIV acquisition. Tanner (2008) states that it should be noted that a condom is 100 percent safe, and it is unlikely that microbicides in the future will offer 100 percent protection.

Although there was enthusiasm towards microbicides as a new prevention method, a respondent from a national health organization articulated how difficult it was to introduce a new product within the healthcare sector (Tanner, 2008). This respondent suggested that innovative education and marketing programs would be necessary to introduce microbicides. Further it was suggested that products that required multiple trips to the clinic and refrigeration would be less likely to be used than other methods of prevention and contraceptive (Tanner, 2008).

Moreover, cultural influences on microbicide acceptability and use: the cultural influences discussed in the focus groups were largely related to gender and power issues. The issue of unequal power based on gender relations and women's economic dependence on male partners greatly affected the use of current contraceptive and HIV prevention methods used by women (Tanner, 2008). Condom use was also negatively affected by the fact that it is believed, in this cultural context, that it is prostitutes who use condoms and therefore women fear to ask their partners to use condoms because they do not want to be misjudged as being promiscuous (Tanner, 2008). Therefore the use of microbicides could have negative connotations attached to it such as those negative connotations connected to condom use, this is why it would be critical to have educational interventions when introducing this new HIV prevention technology. Cultural factors may promote or hinder health care promotion and it is

vital that when introducing new methods within healthcare, these cultural issues are addressed specifically because they will affect the acceptance and utilization of a new health care methods (Airhihenbuwa, 1995). Therefore the introduction of microbicides as new HIV prevention methods need to be accompanied by various educational and culture specific campaigns to effectively encourage both men and women to use these products.

This study from Ghana has brought more understanding into how cultural factors influence perceptions and possible acceptance levels of microbicide utilization by women. What emerged as a key point from this study were people's attitudes towards condoms. The respondents (both men and women) showed a great dislike for condoms and the eagerness to use microbicides came from an idea that they could substitute for condom use. This is a dangerous misconception because current studies suggest that microbicides must be used with a condom as often as possible as microbicides do not offer 100 percent protection against HIV infection during sexual intercourse (CAPRISA, 2010). One of the biggest limitations of this study is the fact that it only took into consideration the views of individuals who have one common culture and the small number of respondents resulted in findings that could not be generalized broadly.

"Acceptability is a complex interplay between a woman, technology and a service delivery environment" (Tallis, 2012: 109). In this quote, Tallis (2012) highlights an important fact that needs to be understood when exploring the issue of acceptability of microbicides, namely that choice of microbicide may vary with each women's preference, the nature of relationship they are in, the environment in which they live and the state of service delivery in which these products will be available. Many factors will come into play that influence acceptability, not all of which can be explored in this study; however research has shown that having a variety of prevention methods for women to choose from is desirable, allowing women to select prevention and contraceptive methods that suit them personally, a variety of prevention methods will allow women to find one option that suits their own needs, health and priorities (Tallis, 2012).

Microbicides in South Africa

The CAPRISA 004 trial was initiated to access the efficacy and safety of 1% Tenofovir containing gel formulation (Abdool Karim et al., 2010). This clinical trial was conducted from May 2007 till March 2010 in KwaZulu –Natal. Women were enrolled if they were

between the ages of 18- 40 years, sexually active, and not pregnant (Abdool Karim et al., 2010). 2160 women were screened, and 1085 were enrolled for the clinical trial; only 889 (611 rural and 278 urban) women were part of the analysis (Abdool Karim et al., 2010). Women were divided equally between the two study arms; the placebo gel and the tenofovir gel. Both the tenofovir gel and the placebo gel appeared identical to each other and the women were not informed in which group arm of the study they were located (Abdool Karim et al., 2010). Women were directed how to use the gel and encouraged to use the gel for every sexual encounter; adherence was calculated for each woman by dividing half the number of returned used applicators each month with the number of reported sex encounters for that month

In the CAPRISA 004 trial, tenofovir gel proved to be effective in reducing HIV infection by an estimated 39% (Abdool Karim et al., 2010). It was established that there was a significant trend in adherence and effectiveness of the tenofovir gel in protection against HIV infection: high adherers had a 54% lower HIV incident rate (Abdool Karim et al., 2010). This reiterates the point that adherence in microbicide studies is important. Adherence monitoring was one of the limitations of this study, there needed to be a higher level of adherence (Abdool Karim et al., 2010). The motivating factors of low adherence levels are not clear; one may however propose that women were challenged by the BAT 24 strategy that is used as a dosing regimen for the gel. It is therefore crucial that more studies on the acceptability and perceptions of microbicides are conducted in order to understand why women would not adhere to using the product. No matter how effective an HIV prevention method or technology is, if the people for whom the product is developed do not or cannot use the product, then the product cannot be effective for HIV prevention.

Acceptability of microbicides is an influential factor in the effectiveness of these HIV prevention methods. Research conducted on the acceptability and perception of microbicides is crucial because studies of this nature will provide useful information on user's preferences towards product characteristics, such as application, design and formulation (Mantell et al., 2005). The female condom is an appropriate example when looking at the acceptability of microbicides. Despite the effectiveness of the female condom, there has been very low use of female condoms and this needs to be understood in order for microbicides to avoid the predicament of low use despite effectiveness (Tallis, 2012; Mantell et al., 2005). Mantell et al. (2005) proposes that inadequate attention to the design, packaging features, overall

product marketing, and poor introduction plans may result in low levels of acceptance of a particular product. It can then be established that research on female acceptance and preferences towards microbicides is of paramount importance.

Challenges facing microbicides

Microbicides are not free from limitations and challenges. Like any other intervention that has the potential to curb the HIV epidemic, what is important is that all the limitations of these biomedical products are explored before they are available for women to use. Firstly, it could prove to be a burden adding ARV based prevention methods in a health system that is already struggling with shortages of structural and human resources (Padian et al., 2011). South Africa's health care system is characterised by deficiencies and poor service delivery, this could prove to be problematic when introducing microbicides as an HIV prevention medication available from these heath care systems (Naledi et al., 2011). Furthermore, a review written by Rowniak and Portillo (2013), explores ethical issues around the use of pre-exposure prophylaxis, and this includes the question of resistance to ARV treatment. It is a concern to try and conceptualise what may happen to women who become infected with HIV despite the fact that they have been using a microbicide that is ARV based, questions of resistance to the only form of HIV treatment is a cause for great concern. More understanding around this question is needed.

Conclusion

There is need for HIV prevention methods that women can use and have control over without necessarily negotiating with their sexual partners. This literature review highlighted the importance of having HIV prevention methods that women could use; this was achieved by firstly contextualising the problem of women being vulnerable to HIV infection. By unpacking the various factors contributing towards women's vulnerability to HIV infection, it was established that biological, social, cultural and economic factors contribute to the vulnerability of women.

Secondly, current and future HIV prevention methods were discussed with the purpose of revealing the tremendous gap that still needs to be filled in HIV prevention methods, particularly for women. Microbicides were then presented as a possible HIV prevention technology that women could use for protection: it was noted that these biomedical products

had ethical challenges which need to be considered. Two particular microbicides were used as examples of microbicides, the dapivirine ring and the tenofovir gel. As research and developments are underway, it is important to examine attitudes and perceptions of utility of microbicides in a variety of contexts, and the purpose of this study is to take a look at the level of acceptance among women (from the University of KwaZulu- Natal) .

It would be anerror to assume that the introduction of microbicides will curb the HIV epidemic independently. Instead new prevention strategies need interdisciplinary approaches to work together to combat the escalating HIV rates in South Africa.
The next chapter presents the theoretical framework that has informed this study and also serves as an explanation of my data.

Chapter 3: Theoretical framework

Theoretically this study adopts the Culture Centred Approach (CCA) proposed by Mohan J. Dutta (2008); the study also explores the Empowerment theory proposed by Perkins Zimmerman (1995) and influenced by other theorists (Rapport, 1984; Lee, 2001; Tallis, 2012).

There is an urgent need to acknowledge the context for women in which HIV prevention methods such as PrEP are being developed. There is also a need to understand context when any form of development is about to take place in order that the development taking place may be relevant for those for whom it is being designed. In the field of HIV prevention, public health practitioners must focus on the communities that are burdened with the highest HIV infections in South Africa. Focus needs to be shifted to those who are more vulnerable to HIV infection. Tomaselli and Chasi (2011) state how participation from relevant stakeholders is essential in the development process because it involves understanding how contexts may influence individuals. As advances are made in clinical trials on microbicide products, it is important that research is conducted on whether these products will be accepted by women in their communities. Before the licensing of biomedical products can be approved, there must be research that is conducted that will lead to an understanding of community acceptability and even women's preferences towards products of this nature. It has been highlighted through various literatures that women will not only benefit from HIV prevention methods that are under their control but also that these products will empower them, giving them autonomy over their sexual health.

The Culture Centred Approach advocates that empowerment is critical for social change (Dutta, 2011). In keeping with my research topic, one of the areas of interest in the development of the tenofovir gel and the dapivirine ring is the empowerment of women in their protection of their sexual health; these microbicides have been said to be empowering tools for women who cannot negotiate safer sexual practices with their partners. By exploring the Empowerment theory, we will come to an understanding of what the concept of empowerment refers to, how empowerment is measured and how to ensure that it is given to those who need it most. Communication is an important part of HIV prevention methods, campaigns, interventions and technologies. Overall, the importance of communication in

HIV and AIDS cannot be emphasised enough, especially in the South African context (Uwah, 2013).

Culture Centered Approach and Health Communication

Health communication is the context in which we will be looking at the Culture-Centred Approach as an operative theory. Health communication is defined by Suggs (2006:62) as:

> *Health communication efforts are often designed to improve lifestyle behaviour, reduces risk factors for diseases, increase compliance with a medication or treatment plan, better self-manage a condition, provide social support, or provide help with making decisions about health*

This definition is one of many other definitions of health communication, interesting here is that the author encapsulates the large scope of what health communication entails. Health communication is important in HIV prevention efforts because communication needs to occur between women who could use microbicide products and those who wish to successfully develop and introduce microbicides. This communication process needs to be a negotiation of meanings and understandings and not just information being passed on from developers to stakeholders (Rensburg and Krige, 2011). Dutta (2008) acknowledges in his work the simple definition of health communication which states that health communication is the study of communication phenomena in the health care setting. This definition highlights the relevance of the theoretical framework for this study because I set out to explore; female (university students) attitudes, preferences and possible acceptance levels of microbicide products; tenofovir gel and the dapivirine ring. This process required that I engage in dialogue with women about a health product that they could potentially use once available.

It is further explained in Dutta's (2008) writings that the field of health communication can be divided into two branches, namely: i) process based perspectives, this is a perspective on communication that explores how health meanings are constructed, negotiated, contested and kept ; ii) message based perspectives, this approach focuses on the impact of health messages on healthcare delivery and individual health outcomes, with the goal of developing messages that will bring a desired outcome. In this study I am more interested in the message based perspectives in health communication because the secondary objectives of this research are 1)

to investigate the attitudes of women towards microbicide products as a form of HIV prevention method, 2) to identify women's preferences towards HIV prevention methods and 3) to identify women's attitudes, preferences and acceptance levels towards two specific microbicide products. By conducting this research I set out to encourage more studies to be developed to ensure effective and efficient roll out of these biomedical technologies when they are licenced in the future, with the goal of developing messages that will bring desired outcomes (which are adherence, acceptance and therefore effectiveness of microbicide products for HIV prevention).

> *As people are entangled in different cultural webs, to be affected by a message, people have to hear it in a way that has cultural significance for them and which connects with their experience of life. Culture has a potential to connect with people and affect them on many different levels. However, communication programmes have tended to focus largely on one level of behaviour change*.
>
> (Gould, 2007 quoted in Chijioke Uwah, 2013)

Uwah (2013), attempts to explain the dynamic relationship between health communications and culture within the South African context. Health communication is very important in HIV prevention efforts as there are various interventions that are implemented by government and NGOs to ensure better healthcare knowledge and understanding. It is also important to understand that within the South African context, there are diverse groups of people from different cultural, social, racial, and economic background: this makes health communication more complicated (Rensburg and Krige, 2011). Culture does not have a universal definition on which social scientists agree but it is accepted and acknowledged that culture is shared, learned, passed on from one generation to the next, and it can be identified in the values, norms and practices of groups (Kreuter et al., 2003). In these groups, certain practices, values and beliefs have a direct effect on health–related behaviors and perceptions towards health messages (Kreuter et al., 2003).

Airhihenbuwa et al. (2000), give recognition to culture as being a critical aspect that must be central to health communication. (Airhihenbuwa et al., 2000) believe that giving recognition to culture is what earns success in health communication. According to these authors health communication that may be effective in a Western context may not be successful in an African context because of the different cultural prescriptions that are embedded in each

context (Rensburg and Krige, 2011). Evidence of the above statement is the example that the implementation of the "ABC approach" (Abstinence, Be faithful, and use Condoms) was effective in some countries while in other contexts, this model was ineffective (Ige and Quinlan, 2012). Not only is there a need for context specific interventions but also culture centred approaches to health communication.

The role of culture in health communication gained recognition in the 1980s in the United States when it became evident that there were shifting demographic patterns (Dutta, 2008). This came with the understanding that there now was a need to respond systematically to the evolving cultural context in the US in order to be effective in a multicultural society (Dutta, 2008). During this time it must have become obvious that effectiveness and efficiency in health communication is also determined by the cultural context: therefore broadly speaking what is operative in one cultural context may be ineffective in another. Therefore understanding the cultural of a particular context can be proposed to be the key in implementing effective and sustainable health messages (Airhihenbuwa et al., 2014). This is the underlying position of this study; in order to develop and introduce microbicides to women that will be relevant and effective; there is a need to first understand the cultural context in which potential users are embedded.

Background of Culture Centered Approach

The Culture-Centred Approach (CCA) derives from critical theory, which emphasises questioning the ways in which knowledge is communicated and talked about (Dutta, 2008). Therefore the CCA looks at knowledge as the subject that should be questioned, as the first access to health communication that explores how knowledge is created and also how it is interlinked (Dutta, 2008). The CCA looks at who creates this knowledge, how it comes to serve them and how this knowledge becomes the dominant paradigm in health communication; this can be seen as a process of interrogation of mainstream beliefs (Dutta, 2008). In addition this approach states that knowledge claims are linked to the power position of those making the claims: in this regard, the CCA investigates knowledge claims made in dominant health communication approaches (Dutta, 2008). Taking from the critical perspective, this approach aims to look at the dominant values in the health care systems that inform the ways in which health care systems maintain control. In keeping with this research, this point is important because as we look at microbicides as developing HIV prevention strategies, we need to first look at HIV prevention methods that are available. By looking at

the dominant paradigms within the HIV prevention field, the context for which these new biomedical products will be rolled out. In this context, the CCA would question the source of knowledge in the current field of HIV prevention, how that knowledge is created, and the position of power held by those who created this knowledge. This is significant because developments cannot be made without understanding the current context of HIV prevention. Furthermore the CCA also draws from cultural studies, which emphasis social construction of discourses and the nature of stories that are embedded in culture (Dutta, 2008).

Central to the CCA is the understanding that communicating about health involves the negotiation of shared meanings that are embedded in socially constructed identities, relationships, social norms and structures (Dutta, 2008). The concept of negotiating shared meanings is very important in health communication because if a health message is imposed on people or just presented to them as an option, no significant impact can be expected from that intervention. It is not just information that people are looking for when it comes to health issues, but rather ways in which health strategies can be implemented in their everyday lived realities. The CCA recognises that people are not just passive receivers of health messages. In his work, Servaes (2008) explores practical ways of creating enabling environments for development to occur. One of the ideas that Servaes (2008) highlights is to use a holistic approach to create a supportive environment that recognises the complex interplay of factors that determines behavior as well as individual's perspectives, in which culture plays a critical role. With the role of culture highlighted as central not only to health communication but also to development initiatives at large, we can state that communication about health issues cannot isolate culture as this is where people's values, beliefs and perspectives are largely influenced. Airhihenbuwa (1995) brings forward the notion that culture should be the pivotal domain in the new era of HIV and AIDS prevention and cure.

The concept of "culture" in this approach refers to the active participation of community members in the making of shared meanings (Dutta, 2008). It can be said from this definition that culture involves recommendations and ideas that are made communally and then become unspoken "truths" and "prescriptions" within a community. Communities or groups have different beliefs and expectations from their members. Further, Dutta (2008) highlights that it is this participation from which shared meanings, values and practices are created. People influence and are also influenced by their cultural context. The emphasis here is looking at how influential culture is on members of a community and on people's views of the word

around them. Cultural perspectives on health are established by day-to-day interactions of its members as they come together to develop their interpretations and discourse of illness, health and wellbeing. Within the HIV and AIDS field, Bowen and Michal-Johnson (1990) state that culture should be a central organising concept in developing programs of HIV education and assessing their outcomes. Bowen and Michal-Johnson (1990) acknowledge in the above quote the crucial role that culture has on HIV programs, thus highlighting the fact that HIV programs that ignore cultural aspects when sending HIV messages will inevitably be limited in effectiveness.

Nkwi and Bernard (2012) write about "culture, behavior and AIDS in Africa", and they explore behavior influenced by culture that contribute to the HIV and AIDS epidemic in Africa. These two authors state that as developments of HIV and AIDS take place in Africa, there is a need to first ask: what are the practices that increase HIV, and how can these be discouraged (Nkwi and Bernard, 2012). They further propose that culturally appropriate interventions are needed to face the evolving HIV epidemic in Africa, and this can be done by creating norms that prevent people from engaging in behaviors that put them at risk of HIV infection (Nkwi and Bernard, 2012). At the centre of bringing about positive developments in people's well-being and promoting healthier behaviors is culture which informs behavior, perspectives, attitudes and values.

Central to the CCA, as briefly mentioned, is the process of questioning dominant paradigms in the field of health: these dominant paradigms determine the meanings of health, problematizing of health and how to address health issues to serve the interest of the status quo (Dutta, 2011). The dominant paradigms in health influence or rather dictate how health interventions are carried out: an example of this would be the West-centric concept of targeting individual beliefs with the assumption that diseases and health are located on the individual level (Dutta, 2011). Airhihenbuwa et al. (2000) also expresses this idea in their work by stating that health issues have in the past been addressed from individualistic perspectives where the person has pre-eminence over their environment, and they alone can solve health problems regardless of their context. The CCA interrogates this notion by proposing that people are located within realms of collective decision making and collective responsibility for sharing health. This approach states that the family, community and society are sites of negotiating health decisions, and that looking at the individual as an isolated entity in health issues is impractical (Dutta, 2011). Kreuter and McClure (2004) strongly

advocate that culture be placed at the centre of planning campaigns, ensuring that messages brought to people are culture sensitive and appropriate. (Dutta, 2011: 135) articulates the same idea:

> *Culturally sensitive health promotion programs operate on the basis of extracting certain sets of tangible characteristics from the culture, closely examining these characteristics and then adjusting the messaging strategies of health interventions to be aligned with the characteristics of the population identified in the formative research*.

The CCA suggests that in the processes of developing a health communication program, intervention or campaign, the researcher needs to keep within a people's or community's cultural framework (Airhihenbuwa, 1995). This is the grounding of an approach that does not want to change people and prescibe behavior, but rather seeks to understand and meet people within their culture context (Dutta, 2008). Kreuter and McClure (2004) state that cultural characteristics of any group may be directly linked with health related priorities, behaviors, perspectives, decisions, or acceptance and adoption of educational health messages. The CCA suggests that when a researcher enters a community to study or investigate a health care issue, she or he should listen and engage in dialogue with members of a community instead of entering the field as an expert (Dutta, 2008). This enables people to feel free in expressing their views and lived realities in an authentic way because when the researcher engages members of a community with the aim of listening and engaging, she or he creates a sense of freedom.

The concept of listening and engaging in dialogue with people was the motive of the focus group sessions that I implemented in this study. As the researcher, I wanted to understand female's perceptions, attitudes and preferences towards microbicides as HIV prevention methods. I chose to engage in focus group sessions as opposed to interviews because I wanted the female students who were part of this study to be in an environment where there are other females, by doing this creating a comfortable environment to engage in dialogue.

One of the main premises of the CCA with regard to health communication emerged from the interaction of three concepts that are central to this theory, namely, (1) structure, (2) culture and (3) Agency (Dutta, 2008).

Structure

Structure refers to the organizations, institutional frameworks, and ways of organising rules and roles that constrain or enable people to access health care facilities or engage in health-related behavior (Dutta, 2008). These structures may refer to transportation services, medical services, basic sanitation, shelter and any other basic health related facility. When looking at the South African context, there are various structures that the government has put in place for people to access medical care such as hospitals, clinics, mobile clinics, ambulances, campaigns for health promotion and many other structures. What is important to know about these structures is that they can be enabling or constraining. Enablement or constraint means that these structures can assist people (which is the primary purpose) or they can be limiting, causing some communities or contexts not to have access to health care services. Structures actually define and limit what healthcare services are available to a group of people, and one of the driving forces of the CCA is to gain understanding into structures that can limit the access to healthcare resources for members of a community.

Within the context of this study, the research units and organisations that sponsor and develop microbicide clinical trials are also structures which assist in the availability of microbicides. Such organisations include CAPRISA which aims to assist people by providing empirical data on the development of microbicides. If a future microbicide is made available, then healthcare services including clinics are structures that will assist people to access the microbicides as new HIV prevention technologies. Structures encompass units such as hospitals, transportation, or services that aid people in accessing healthcare services, and in this instance, healthcare services pertaining to microbicides as HIV prevention technologies.

Culture

Culture, as highlighted above refers to a dynamic interplay of meanings created by members of a community. Culture is one of the strongest frame- works that influence an individual: the way in which people define and understand illness, health and wellbeing is influenced largely by their cultural context. Cultures are different in their view of concepts and behaviors; this is why it is important to implement culture sensitive approaches when new developments are underway as there is a growing demand for culture sensitive interventions. The CCA informed the decision to use focus groups as a means of collecting data for this research. I

set out to understand women's perception, attitudes and preferences within the cultural context of female students.

Agency

Dutta (2008) explains agency as the capacity of cultural members to endorse their choices as well as participate in negotiating with the structures they are in. It is therefore the ability of communities, groups or individuals to participate in a variety of actions to challenge or work with the structures that constrain their lives (Dutta, 2008). In the health communication context this would refer to the involvement of groups or individuals in determining health agendas and also being part of developing solutions to health problems that they may be facing. The concept of agency is important because it is here that the process of negotiation takes place in health communication. It is through the vocalization of statistics that the development of microbicides was developed; this is evident in an article written by Stein (1990) which articulates how the notion of developing women-controlled HIV prevention methods started to gain recognition. Stein (1990) expresses that, during this period, voices that articulated this idea were few but as the years went by, the idea of having women-controlled HIV prevention methods gave birth to the field of microbicides.

In the work of Dutta (2008), the three concepts (structure, culture and agency) are said to be intertwined and create a platform to listen to individuals who are usually marginalised. For the purpose of this research, these concepts are important because hearing various women's attitudes, perspectives, preferences and opinions about microbicides as an HIV prevention method is a critical objective. Given the purpose of this study, it did not have access to a wide variety of women; rather the group of women involved in the research process are given a platform to share their views and opinions towards the tenofovir gel and the dapivirine ring. The researcher shared knowledge about these microbicide products and also asked the women involved in the study about their current methods of HIV prevention, their preferences around these and also their views of PrEP methods of HIV prevention. This then creates a space for women who would usually be excluded from a development process such as this one to exercise their agency through interrogating the knowledge presented to them and informing a health communication initiative.

The CCA is a very broad theoretical framework that covers various issues and can be used in a number of fields, not only those of health communication. Dutta (2008) lists characteristics of the CCA as follows: voice and dialogue, structure, context and space, values, and criticism. For the purpose of this study I will only explore the first four of these characteristics:

Voice and dialogue

The emphasis in this framework is to create a space for dialogue for those who have been marginalised. In the context of HIV prevention developments, the marginalised are women. The CCA seeks to give a space to those who are marginalised to voice out their perspectives, attitudes, values and opinions on issues of health (Dutta, 2008). By doing this, the CCA encourages the researcher to engage in dialogue where she or he gains a sense of understanding of the community's perspectives and how health meanings are constructed (Dutta, 2008). The focus groups in this study served as platforms whereby young women could engage in dialogue, expressing their attitudes, values, preferences and perceptions towards microbicide as HIV prevention technologies. The focus groups were also mediums in which young women could become involved in discussions from which they are usually excluded.

When analysing the approaches that have been employed in South Africa that address HIV prevention issues, there is a growing need to move away from just putting out messages to creating a space for those most affected by the pandemic to be heard (Panos, 2013). According to reports from Panos (2013), the most effective responses to HIV and AIDS are those that emerge from the communities, it is the interventions that have involved the members of communities which have proved to be effective. This suggests that when new HIV prevention technologies are being developed, potential users of microbicides should be involved.

The development of biomedical products usually does not include dialogue with people for whom the products are designed. In this small scale study, most of the respondents had not heard or known about microbicides prior to this research. This research is the first comparative study on microbicides to be conducted at UKZN; furthermore, this study is at the forefront of research endeavours that have sought to investigate women's perceptions and attitudes towards microbicides as HIV prevention methods.

Structure

Structure refers to organisations and systems that determine how society is organised, how it functions and who gets access to healthcare services (Dutta, 2008). The emphasis is on gaining a sense of understanding of how structural processes in healthcare settings limit community contribution (Dutta, 2008). What the CCA is concerned about is how structures in society limit people from exercising agency. The CCA looks at structures as sites that restrict individuals and communities from engaging in health care issues in an instrumental way but this is not always the case, as there are structures in society that provide platforms for communities to be part of health care programs, interventions or projects.

Structures can encourage or limit certain health behavior in individuals: in the context of this study, these institutions are through MTN, CAPRISA and ASPIRE - these are the structures conducting studies to develop microbicides. The literature that has informed this study looks closely at the structures within the field of microbicides as HIV prevention methods with the purpose of understanding currently available methods of HIV prevention. I explored closely clinical trials conducted by what can be referred to as the most influential structures within the field of microbicides, namely, CAPRISA, ASPIRE and MTN. The purpose of exploring these structures was to understand who or what informs dominant paradigms within the field of microbicides as female HIV preventative measures.

Context and space

Context and space refers to the local and immediate surroundings within which cultural members make choices and are part of the day to day life experiences of the community members (Dutta, 2008). This is a critical point because this is where individual's preferences, values and acceptance levels of any phenomenon are shaped. The context and space in which one is embedded influences the behavior and lived experience of an individual. Dutta (2008) also makes the point that contexts are intertwined with the structures that the community is in, structures can therefore constrain contexts in which communities are situated. In this study, the use of the product will be influenced by the context women are in; whether women live at home with parents, or in their own spaces (i.e. residence).This study is also interested to see if findings will reveal what influence context and space have in women's attitude, preferences and acceptance of the tenofovir gel and the dapivirine ring as a method for HIV prevention. One can predict that context and space will have a significant influence regarding

which microbicide product women prefer to use to protect them against HIV because the application of these two products is very different. Context and space can encourage or discourage an individual from using a particular HIV prevention method, for example, in some cultural contexts condom use is not encouraged (Tallis, 2012).

The questionnaires that were distributed set out to investigate the responses from students living at home in comparison to students living in residences at the University or renting apartments. It can be proposed, according to the CCA, that the context in which students live has an influence on preferences and attitudes towards HIV prevention methods such as microbicides. The CCA suggests that structure and context influence an individual's attitudes, values and preferences; this is the notion that is adopted in this comparative study.

Values

The CCA proposes that values are central to the way in which people conceptualise problems and the solutions which they use to address these problems (Dutta, 2008). Further, values act as a lens through which people identify problems. Therefore, what may appear to be a problem to a certain culture may not be seen as a problem in another cultural context. The problems of health issues is also not free from a cultural lens; cultural values are not only linked to the way we identify health problems, but also with how we solve these health issues (Dutta, 2008).

In keeping with the theme of this study, one of the main questions investigated is whether UKZN female students believe that they are at risk of contracting HIV through sexual intercourse, this will influence perceptions towards new HIV prevention methods to which they become exposed. The values that UKZN students have will influence their attitudes, preferences and acceptance levels of microbicide products. The focus group sessions as well as the questionnaires also set out to investigate and understand female student's values regarding HIV and AIDS, and safe sex practices. It was important for this research to investigate and understand the values of females because it is these values which inform their preferences, attitudes and perceptions towards microbicides as HIV prevention methods. The contextual values from which female students view HIV and AIDS, will inform their perceptions towards developing prevention methods. It can be proposed that if students do not believe they are vulnerable to HIV infection, then they will not see the need for developing HIV prevention methods i.e. microbicides.

These CCA characteristics inform my study as they draw attention to the root issues that influence attitudes, perceptions and acceptance levels from women towards HIV prevention methods. The knowledge generated by the work of Dutta (2008) enables the researcher to not only holistically explore biomedical HIV prevention technologies, but also allows for critical thinking. This theoretical framework encourages my study to pose questions and not rely on assumptions about women's values and attitudes towards HIV prevention. There is an increasing awareness in the importance of culture in the field of health communication and there is also a vast space in which health communication interventions can contribute to new developments in HIV and AIDS prevention, helping to curb the increasing HIV and AIDS epidemic.

Criticism of Culture-Centered Approach

Like any framework, the CCA is not free from criticism of its discourse. Firstly, within the South African context there is a broad spectrum of cultures, with eleven official languages and because of this diversity in culture, developing culture sensitive health intervention may be challenging. HIV and AIDS is a national problem in SA, it is an epidemic that cannot be located in one cultural context but rather it affects society at large. The fact that there are so many cultures within South Africa makes the development process of health interventions challenging because there is a wide cultural spectrum that the intervention must consider and reach out to. This is not to say, however, that culture sensitive approaches cannot be developed in South Africa for health issues.

Secondly, the notion of the researcher entering into a community to engage in negotiations of meaning through the process of dialogue with community members is not always possible in some contexts. In some communities, members may show resistance in entering into meaningful dialogue with a researcher, even when the researcher enters the community with an attitude to learn (as suggested by the CCA). The CCA proposes that the researcher should listen and engage in dialogue with members of a community instead of entering the field as an expert (Dutta, 2008). This will not be possible in a context where community members refuse to engage in dialogue with the researcher.

Thirdly, the CCA portrays the idea of challenging and interrogating dominant discourses in health as a simple mission, yet in reality this is a complex task. This is not to say that it is not

possible to challenge dominant discourses in health through agency, but the process can be an elaborate one depending on the level of power exercised by those who have imposed these discourses. For example, if a health issue that is challenged by a group of people is influenced by the constitution, it will prove to be a challenge oppose.

Empowerment Theory

> *The converse of vulnerability is empowerment. An empowered person is able to make free and informed decisions, and act according to these decisions. In contrast, a vulnerable person, due to lack of information, skills, opportunities or other external circumstances, is unable to make informed decisions freely*
> (Tallis, 2012: 25)

As research has brought confirmation that women are the most vulnerable to HIV infection, with young girls in particular being disproportionally infected with HIV compared to their male counterparts, it is necessary that tools that will empower women are developed. Tallis (2012) proposes that empowering women will address the issue of vulnerability; this is a notion worth considering because women are faced with the challenges of not being able to make free and informed decisions concerning their sexual health. Women need to be given power so that they can be active agents of their own sexual health. It is important to first define power when studying the concept of empowerment. Foucault and Gordon (1980) state that power is only meaningful in social interactions; it is established in a network of social interactions. Further, Foucault and Gordon (1980) assert that power is not possessed but rather it is exercised and circulated in a social setting. These philosophers were interested in examining how power operates in day-to-day lives of people and institutions. They explore power not as exclusively oppressive but also as productive causing new behaviors in people to emerge (Foucault and Gordon, 1980).

According to Melkote and Steeves (2001), real change cannot be experienced unless power disparities between the marginalised and grass roots level and those who make policies are addressed. The concept of empowerment is shared between various disciplines that hold different definitions: in this study, a definition by Melkote and Steeves (2001) is utilized as these theorists study empowerment with- in the development context. This study looks at

empowerment of women within the developmental process of new biomedical HIV prevention methods, namely microbicides "…empowerment is defined as the process by which individuals, organizations, and communities gain control and mastery over social and economic conditions…" (Melkote and Steeves, 2001:37).

As HIV prevention tools that promise to empower women, microbicides may give women a sense of agency over their sexual health. Taking from Foucault's definition of power, microbicides may give women the ability to exercise "power" over their bodies within a sexual relationship. Giving women an option of not depending on their male partners for protection against HIV infection, translates to empowering them; giving them the resources that will lead to informed decisions. Within the empowerment theory, empowerment is positioned as addressing problems of people who are powerless. Within the South African context many women lack the ability to protect themselves against HIV infection; many women are in sexual relationships where they cannot negotiate safer sexual practices: in these sexual relationships, the power to make decisions is within the hands of male partners. Moreover, there are several factors that contribute to the lack of power women experience: social, cultural, economic and biological factors (as discussed in the previous chapter).

There are three levels of empowerment highlighted by Lee (2001) that describe the different types of empowerment within the empowerment approach: personal level, interpersonal level and political level. Below we will explore these three levels of power, identifying their attributes and dispositions.

The Personal Level

Within this level, power is looked at from a personal and individualistic dimension. Within this level, the idea of how dealing with negative judgments such as oppression of race, class or gender disparities may lead to people having low self-worth, vulnerability and challenges brought by institutional racism; classism is also emphasised (Lee, 2001). According to Lee (2001) oppressed people must be the ones who ensure that these forms of oppression (ie racism, classism and gender disparities) are removed, and that they are free, refusing oppression and joining others to work against this domination. In essence then, what is being proposed here is that empowerment is not given to a particular people but rather people should take and exercise power themselves. There is a need for agency in the people who are oppressed, vulnerable or powerless. Significantly, Lee (2001) articulates the fact that people's

personal experiences may combine with oppression to constrain personal empowerment or to enable it.

On a personal level, it is the responsibility of women to ensure empowerment, and exercise it accordingly. In relation to this study, women need to have a sense of agency, taking initiative to protect themselves against HIV infection. Microbicides are simply tools that are designed to give women the ability to exercise agency.

In keeping with this research, this level of empowerment is crucial as microbicides are HIV prevention technologies that need to be used by women; women need to be the active agents in using these biomedical tools to empower themselves. Moreover, microbicides cannot be obligatory for any woman but rather it is women who need to empower themselves by taking initiative to use these products.

The Interpersonal Level

Within the interpersonal level, power is defined as the ability to influence others to reach desired means or goals (Lee, 2001). This power is usually exercised over people by their family, social group, and culture. It is very important, then, to understand the context in which people are situated because these contexts may have a strong influence or rather have power over people. Empowerment is exercised when people come together in small or big groups to plan and take necessary actions towards goals; this raises people's consciousness about oppression and a heightened understanding of empowerment through group action (Lee, 2001). Collective action for empowerment is emphasised in this level moving away from viewing the individual as independent.

It would be incorrect for one to assume that women are independent of their immediate cultural context and interpersonal interactions. It is on this basis that this research explores female students' perceptions within their day to day context; it is in these discursive spaces that their perceptions are constructed and developed. It is within these social contexts that power is exercised over women, family, friends, culture, or any social group, usually exercise power over women by informing even the perceptions and attitudes towards ideas and concepts. Therefore it is important for this study to highlight the importance of power within the interpersonal level because this is where perceptions and attitudes are shaped.

The Political Level

According to this approach, oppression is ultimately a political problem that needs political solutions (Lee, 2001). The empowerment theory brings in the concept of power in the lives of women in a positive light: it assumes that power is not limited but rather that it can be generated through social interaction (Gutierrez et al., 2000). Political power refers to the ability to influence the distribution of resources in a community through various forms; this power is gained through collective action (Gutierrez et al., 2000). When looking through the HIV prevention lens, this translates to collective work that will impact the conditions that cause women to be vulnerable to HIV infection. As has been discussed in previous chapters, women are vulnerable to HIV due to several factors which include being economically disadvantaged; this needs to be addressed through collective action.

Whilst personal, interpersonal and political power are all relevant, this study will focus particularly on personal power which involves an individual seeing herself as an effective and capable person (Gutierrez et al., 2000). In relation to HIV prevention, this could entail understanding ways in which women can have health status autonomy through safer sexual practices.

Empowerment orientated interventions enhance wellbeing while aiming to solve problems and provide opportunities to people (Perkins and Zimmerman, 1995). The Empowerment theory asserts that empowerment includes both the process and the outcomes; this suggests that the development that leads to empowerment is in itself empowering. Perkins and Zimmerman (1995) propose that the empowerment process at the community level can include collective action to gain access to resources, while empowerment outcomes include resource mobilization skills. Similar to these notions is Pettit's, (2012) description of empowerment; empowerment is not only a means to achieve development but rather an end in itself, a process driven by those who have previously been denied opportunities. Empowerment therefore entails participating with others to mobilize resources that are needed. In keeping with this study, empowerment for women will necessitate the mobilization of biomedical technologies such as microbicides, once these products are licenced and available. Within the context of this research, the empowerment process can include the active participation in research that will inform future microbicides.

Microbicides as empowering tools

Empowerment involves enabling people to gain access or control over resources, information, choices and opportunities so that they are able to improve their current situation (Pettit, 2012). This implies that empowerment will enable women to have access to resources that will lead to an improved way of living. Rapport (1984) proposes that empowerment strengthens people's competencies, invoking behavior that will lead to social change. Microbicides as HIV prevention technologies have been introduced as empowering tools for women, enabling women to be active in their sexual health. When evaluating microbicides as tools of empowerment, the first aspect to note is that these prevention technologies present a method of HIV prevention that gives the woman the ability to initiate safe sex practices without her partners' consent.

The availability of microbicides will help women gain control over their sexual health and enable them to take initiative in the process of HIV prevention. Currently, women are in the position of being the most vulnerable to HIV infection when compared to their male counterparts; it is therefore only relevant to have biomedical technologies such as microbicides in development. In the context of gender inequality, HIV prevention methods such as microbicides must be prioritized as they have the potential to empower women. To address the issue of women being vulnerable, Tallis (2012) has proposed empowerment as an inverse of vulnerability, stressing the matter of enabling women to make informed decisions.

The use of the Empowerment Theory and the CCA equip me as the researcher to consider issues of power dynamics and cultural elements in the study of biomedical research. The CCA advocates that the appropriation of power by biomedicine draws attention away from the socio-cultural roots of health problems to the individual level of health (Dutta, 2008). Therefore the CCA allowed me to explore biomedical HIV prevention technologies through a cultural lens, and by doing this bringing balance to the power discrepancies in health related problems. The agreement of the CCA and the Empowerment Theory lies in their activism for the appropriation of power and the contestation of norms which prescribe women subordinate roles to men. By employing the CCA and Empowerment theory, my dissertation aims to have a holistic perspective towards female's students' perceptions, attitudes and acceptance levels towards microbicides. Both the CCA and the Empowerment theory are the theoretical basis that validates my study's design, data collection and data analysis. The following chapter will outline the methods employed in this study to collect and analyse data.

Chapter 4: Methodology

The scope in which a methodology should comprehend is:

> *When we talk of research methodology we not only talk of the research methods but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method or technique and why we are not using others so that research results are capable of being evaluated either by the researcher himself or by others* (Kothari, 1985: 8)

This chapter elucidates in a systematic manner the research methods that were employed by the researcher, as well as the philosophical foundations of these methods. The following chapter will present and describe the research paradigms, the research design, the sampling frame, data collection and data analysis procedures. Therefore this chapter will expound on how the researcher 'planned' the research. Lastly, this chapter will assess issues of validity, reliability and ethical considerations involved in this study.

Methodology Map	
Ontological Assumption	Nominalist
Epistemological Assumption	Interpretive Social Science (ISS)
Theoretical Perspective	Qualitative Research Approach & Quantitative Research Approach
Sampling Technique	Non-probability Sampling Convenience Sampling
Methods of Data Collection	Questionnaires and Focus Groups
Data Analysis Package	Thematic Analysis

Table 4-1: Methodology Map

Research Paradigm and Design

Interpretive Social Science

This research is centered around the subject matter of female students' perceptions, attitudes, and preferences towards HIV prevention methods, specifically microbicides. The ontological perspectives adopted in this research are referred to as a nominalist stance, which states that our experience of the world (physical and social) relies heavily on our cultural interpretations (Neuman, 2011; Chilisa, 2012). Ontology refers to the philosophy of what exists; it is concerned with the nature of being, whereas epistemology is the understanding of how we know the world around us, how people come to understand reality (Neuman, 2011). Therefore, this study implemented an interpretive paradigm, which in the social sciences is referred to as Interpretive Social Science (ISS).The ISS is mainly concerned with discovering how people construct meaning within their contexts ie natural surroundings (Neuman, 2011). This is the philosophical basis of the study at hand: the researcher is interested in studying what female students' perceptions, attitudes and possible acceptance levels of microbicides as HIV prevention methods. This dissertation is concerned with what informs these preferences, and how female students come to "make meaning" of the reality around them.

The ISS asserts that the researcher must take into great consideration people's reasons for their perceptions, as well as the social context in which these perceptions are shaped (Neuman, 2011; Chilisa, 2012). For the purpose of this research, the subject matter of inquiry will be looked at through this lens, with the aim of comprehending what women's perceptions are towards microbicides, and what informs these perceptions. Crotty's (1998) definition of ISS includes the idea that the researcher is concerned with the culturally derived and historically situated interpretations of the social world. This definition encompasses the philosophical foundation of this dissertation which has sought to not only determine women's preferences towards microbicides, but also to understand what cultural and contextual factors influence these perceptions. Microbicides promise to give women a degree of control over safe sex practices, therefore it is imperative for social scientists to understand women's preferences, attitudes and possible acceptance levels of microbicides as HIV prevention methods, so as to ensure that when microbicides are available, they meet the desired preferences of women. The ISS also accommodates the theoretical framework employed in this research, namely, the CCA. Acknowledging the cultural and contextual influences on female's perceptions towards HIV prevention methods will be crucial in the development of

new HIV prevention methods, in that new prevention methods can be designed to be contextually appropriate. Within the ISS paradigm, facts are viewed to be context specific, with the understanding that people's ideas of reality and their experiences are subjective (Neuman, 2011; Chilisa, 2012). ISS is located within qualitative methods of research, emphasizing the notion of studying a phenomenon in great detail in order to acquire a profound understanding (Neuman, 2011).

This study employed a mixed method approach towards the research inquiry, which included qualitative and quantitative methods of research. A mixed methods approach refers to a research methodology that is inclusive of more than one method of conducting research with a study which arguably increases the reliability and validity of a study. Within the context of this study, it proved to be constructive to employ a mixed methods approach as this allowed me to explore and study a phenomenon with a relatively larger group of female students, in an interpretive manner. As the researcher, I wanted to utilize the best of qualitative and quantitative methods of inquiry with the intention of achieving optimal results. Therefore, this intention was facilitated by the use of 100 self-administered questionnaires to gain preliminary data that would inform the focus groups. Even though this study is located within the ISS, and the questionnaires are within positivist paradigm, the questionnaires were utilized through a flexible procedure.

Dyll-Myklebust (2011: 35) refers to a concept called "hybrid-approach". As she explains, this approach incorporates the idea of employing a multi-faceted data collection and analysis process. The notion of the "hybrid-approach" is similar to the idea of employing a flexible approach to research, removing conventional barriers that restrict the researcher from applying data collection and analysis methods that run across the qualitative and quantitative frameworks. Given this study's questions and objectives, as the researcher, I wanted to collect preliminary data from the questionnaires that would inform the focus groups, yet analyze the questionnaires data in a qualitative manner. Sometimes the circumstances of a particular study demands that both qualitative and quantitative methods of inquiry are employed in order to meet the objectives and questions of the study: this results in the utilization of a mixed methods approach (Bless et al., 2013). It is on this basis that this research adopted a mixed methodology.

Qualitative and quantitative Research

This research deals with subjective variables such as attitudes, preferences, interpretations, perceptions and notions from several women. On this account, it was appropriate to utilize qualitative methods of research. A holistic working definition of qualitative research is:

> *Qualitative research is a form of long-term first hand observation conducted in close proximity to the phenomena under study. The research is, ideally, performed in a naturalistic setting with emphasis on everyday behaviour and is often descriptive in nature*.
> (Jankowski and Wester, 1990: 44)

The social context is considered to be significant in qualitative research; the researcher is not only concerned with the data collected, but also with the context in which the data was collected. This study was contextualized within the University of KwaZulu- Natal (UKZN), Howard Campus, with the intention of specifically studying the perception of female students in this context. With HIV prevalence rates at their peak within the age group of 25-29, and with University institutions being largely populated with this age group, it was pertinent to contextualize this study within a university setting (Shisana et al., 2012). In qualitative research, social context is emphasized because meaning of an action or perceptions greatly depends on the context in which it occurs (Neuman, 2011).

This study employed qualitative methods of research in order to collect in-depth data on female perceptions towards microbicides as developing HIV prevention technologies. However, whilst this study is largely qualitative, it also adopted a quantitative process to get preliminary findings to inform the design of the qualitative process. Therefore s a mixed methods approach is utilised.

There was a need for the researcher to use a detailed method of collecting data in order to ensure that thick-descriptive data is collected. The aim of the dissertation is to produce descriptive data that will address the following questions:

- What are the attitudes of females (university students) towards HIV prevention methods that are currently available i.e. the condom (male and female condom)?

- What are these women's preferences when it comes to HIV prevention methods? Do they want to use female condoms (taking initiative in the process of safer sex) or do they prefer their male partners to wear male condoms (trusting their partners to initiate safer sex)?
- What are the possible acceptance levels of microbicide products, specifically the tenofovir ring and the dapivirine ring as possible HIV prevention methods by these females?

It is evident from the above questions that relevant answers would be obtained by largely focusing on qualitative research, rather than quantitative research. Unlike qualitative research, quantitative research is usually concerned with questions about 'how many' or 'how much' i.e. quantitative research is interested in statistical values (Green and Thorogood, 2004). Qualitative approaches, on the other hand, focus more on the depth of understanding. Furthermore, this approach to research is appropriate for studying attitudes, perceptions and behaviors (Bouma and Atkinson, 1987; Neuman, 2011). Quantitative data was solicited by questionnaires to establish attitudes, perceptions and acceptance levels towards microbicides, as well as HIV prevention methods that are currently available. Quantitative research was employed because it allows for the researcher to identify similar responses, as well as different responses or any relationship between responses (Bless et al., 2013; Struwig and Stead, 2013). Moreover quantitative research allows the researcher to engage with a larger number of people which can enhance results. However it is important to acknowledge the fact that quantitative research may result in exaggerated results which lack descriptive explanations.

It is therefore on these philosophical grounds that the researcher selected a mixed method approach for this study; concepts such as attitudes, preferences and acceptance are subjective and therefore best studied with a qualitative approach, yet there was a great need for me to first collect quantitative data that would inform the qualitative data collection. Qualitative research is characterized by collecting data in its natural setting, focusing on participants or 'actors' perspective, understanding the social context in which a phenomenon occurs. Primary data is usually in the form of 'thick' descriptions, and qualitative research offers a deeper and more personal approach to research (Bouma and Atkinson, 1987; Creswell, 1994), whereas quantitaive data allows the reasercher to study a phenomenon with a large sample.

The overall goal of the research approach utilized in this study is to analyse the perspectives and perceptions of female students towards microbicides. As prescribed by qualitative research, the researcher in this study emphasises the idea of understanding participants (respondents) viewpoints and their ideas pertaining HIV prevention methods. According to Bouma and Atkinson (1987), the essence of qualitative research is to view situations or events from the perspective of the people being studied: how do they view the world and what do they think? In this case, the female students from UKZN are studied in order to gain a deep understanding of what their perception are towards microbicides as HIV prevention methods.

Setting

Primary data gathering for this research study commenced between December 2014 and March 2015 in Durban, KwaZulu-Natal. Data gathering included self-administered questionnaires and focus group sessions at UKZN Howard Campus with female participants. The University of KwaZulu-Natal was formed in 2004 from a merger between the University of Natal and the University of Durban Westville[12]. UKZN consists of five campuses; Westville Campus, Medical Campus, Edgewood Campus, Pietermaritzburg Campus and Howard College Campus. Due to technical constraints, the researcher decided to focus on one of the five main UKZN campuses, which is the Howard Campus. Situated in Durban, Howard Campus offers a full range of degrees, with students from an array of cultural backgrounds; this ensured that the researcher had a variance in the sample population. Howard College is also the largest of the five campuses, with the largest number of residential students.

Sampling

When selecting a sample, two major mistakes must be avoided:

"*The first is to conduct sampling in a sloppy or improper manner; the second is to choose a type of sample inappropriate for a study's purpose*" (Neuman, 2011: 242)

[12] www.ukzn.ac.za

The participants in this research were selected according to a non-probability sampling technique referred to as convenience sampling. In non-probability sampling, participants are selected in an arbitrary manner and this lies heavily on the researcher's judgment (Struwig and Stead, 2013). In qualitative sampling, the goal is not necessarily for a representative section of the population to assess, but rather the goal is for a deeper understanding about processes, behaviors, social event and people's perceptions (Neuman, 2011). Thus Qualitative research is concerned with participant's relevance to a research topic, and not necessarily their representation of the population. For the purpose of this study, I employed this philosophical assertion, and selected participants according to respondents' relevance rather than their representativeness of the general population. This study is in no way interested in yielding accurate estimations, but rather in keeping with the aim of this study, the researcher is interested in studying female perceptions, attitudes and possible acceptance levels of microbicides. This is the rationale in soliciting non-probability sampling.

Convenience sampling entails selecting participants on the basis of their availability, convenience and accessibility (Struwig and Stead, 2013; Neuman, 2011). This sampling technique does not in any way aim to present statisitical findings, therefore participants are selected according to their availability, and relevance to the study. The researcher selected female students from UKZN Howard Campus according to their availability, accesability, convenience, as well as their willingness to be part of this study. All the necessary legal permissions from the campus registrar was obtained before particiants were recruited for this study. It was important that the potential participants displayed willingness to be part of this study to ensure that they engaged and participated in the reasearch accordingly. The rationale for this sampling technique was the researcher's aim to study female students attitudes, perceptions, and possible acceptance levels of developing HIV prevention methods, therefore there is a need for participants to have a certain level of willingness in order to contribute valuable information towards the study. Because this study selected convenience sampling, the findings can not be generalised; however the findings reveal deep insight into the area of interest.

The target demographic was narrowed by the fact that this study was interested in female student's perceptions; therefore sampling was restricted to female students. Participants were selected according to the researchers' perceptions on the participant's relevance to the study.

Questionnaires were administered in several areas on the Howard Campus, for example; the Malherbe Library, Music Library, the cafeterias, the garden areas, study areas etc.

Methods of data collection

Data collection was dependent on the administration of 100 questionnaires and two focus group sessions. The questionnaires were self- administered with the purpose of gaining preliminary data that would inform the focus group sessions. Neuman (2011: 506) "*In qualitative research, we start looking for patterns or relationships while collecting data. We use results from early data analysis to guide subsequent data analysis to guide subsequent data collection*". It was on this basis that questionnaires were administered for preliminary data, the researcher had the intention of planning the focus group sessions according to data that emerged as imperative from the questionnaires.

The questionnaire served as preliminary data to inform further data collection for the focus group sessions; the focus group session outline was compiled by the researcher with the assistance of her supervisor (see Appendix 4). Participants were asked if they were willing to voluntarily fill in the questionnaire, hence a consent form was attached in front of the questionnaire. The questionnaire consisted of both closed-ended questions and open questions. According to Struwig and Stead (2013) open-ended questions refer to questions that participants are free to answer in their own words, expressing any and all views about the research topic. The rationale for including open-ended questions was to allow participants to elaborate their views.

Focus groups are planned discussions with a group of participants; they are facilitated by a researcher for the purpose of collecting in-depth views and opinions about a research topic. A definition that is applicable for this study describes focus groups as informal discussions that are planned in order to elicit participant's perceptions towards specific issue (Krueger, 1998). According to Struwig and Stead (2013), focus groups sessions usually consist of 4 to 12 participants who voluntarily discuss issues that relate to the subject matter of the research. Two focus group sessions were conducted in order to collect thick-descriptive data on female student's perceptions towards developing HIV prevention methods for women. The first focus group included eight participants, and the second focus group session consisted of four

participants. The focus group sessions were recorded with the consent of all the research participants, and these recording were later transcribed for the purposes of analyzing the data.

Data Analysis

In qualitative research, data analysis does not formally begin once all the data has been collected but rather data analysis is initiated prior to the formal collection, and the process is seen as continuous (Struwig and Stead, 2013).

Data collected through the 100 questionnaires was manually analyzed, meaning the researcher read through every questionnaire, and formulated tables that would categorize all the collected data. Data from the questionnaire came in a voluminous form, and therefore there was a need for the researcher to select and capture information that was theoretically significant. The researcher also divided the questionnaires into two groups: students living at home with their parents, and students living at a University residence or renting off-campus. This was to evaluate if there is a significant difference in perceptions towards HIV prevention technologies from students residing at home and those not staying at home. According to the Culture-Centred Approach, the context and space in which one is located influences the behavior and lived experience of an individual, as well as their perceptions (Dutta, 2008). A total of 30 questionnaires were filled in by students staying at home with their parents, and 70 of the questionnaires were filled in by students living at a University residence or renting off-campus.

The primary concern and purpose of the questionnaire was to gain an understanding of what female students perceptions are towards HIV prevention methods that are available, as well as perceptions towards microbicides as developing prevention methods. This is the focal point from which data from the questionnaires was analysed: from this point, the researcher would gain a deeper understanding of the research interest which later contributed as a guide in subsequent data collection in the focus groups. Once data from the questionnaires was cleaned, analysed and assertions could be developed, the researcher used this to design a focus group session outline. For the purpose of this study thematic analysis was employed to analyse data collected.

The data from the focus group was analysed using manual thematic analysis. This simply meant that no software was used to analyse data, but rather the researcher manually goes through the data. According to Braun and Clark (2006), thematic analysis is a qualitative technique used for identifying, analysing, and reporting patterns ie themes within data. This method of analysing gives the researcher the platform to understand the data in detail, eliciting meaningful assertions about the research interest. A theme captures something important about the data in relation to the research question (Braun and Clark, 2006). It can be established from this definition that the researcher needs to have a deep understanding not only of the subject matter, but also of the data collected in order to draw out meaningful themes from the data. Data analysis involved printing out all the transcriptions from the focus groups, reading and identifying themes, then grouping the various comments from the participants according to their respective themes. This was a detailed process guided by the phases of hematic analysis proposed by Braun and Clark (2006).

In keeping with the epistemological assumption of this study, ISS aims to acquire in-depth knowledge of other people's perceptions, and appreciate the wide diversity of "lived human experience" (Neuman, 2011). This was the driving force behind data analysis, where the researcher sought to identify patterns in participant's responses and contributions, and from here the researcher created meaningful and relevant themes.

Nine themes were identified by the researcher; (1) *focus groups as platforms for dialogue*, *a Culture-Centred Approach*, (2) *female students perceptions towards HIV prevention methods*, (3) *female student's attitudes towards microbicides as HIV prevention methods*, and (4) *female student's attitudes, preferences and acceptance of the tenofovir gel and the dapivirine ring*. (5) *Gaps in knowledge and behaviour in HIV prevention*, (6) *power dynamics in HIV prevention*, (7) *cultural issues*. These themes were selected and analysed following the phases of thematic analysis proposed by Braun and Clark (2006).

Phases of Thematic Analysis	
Phase	Description of the process
1. Familiarize yourself with your data	Transcribing data (if necessary), reading and re-reading the data, noting down initial ides.
2. Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes	Checking in 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.
5. 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.
6. Producing the report	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Table 4-2: Thematic analysis- Adapted from Braun and Clarke (2006: 87)

The phases proposed by Braun and Clark (2006) were applied in this study in the following manner:

1. Firstly, the recordings from the focus groups were transcribed. Next the researcher read through the data several times in conjunction with listening to the focus group recordings, so as to familiarize herself with the data.
2. The researcher then coded the transcribed data by writing codes on the axis of the transcriptions, taking note of key points that were emerging from the data.
3. The researcher had volumes of codes, the codes were then collated; the next step was to develop the themes according to their relevance to the research interest.
4. The themes that were developed were then reviewed to see if they were relevant and to also coordinate overlapping themes.
5. Next, the researcher looked at each theme, cleaning it up and refining it with the purpose of developing clear definitions and appropriate names for each theme.
6. The final step included reviewing the data to extract key examples that could be used in the final report. This data was then presented, explained and analyzed in relation to the research questions and literature.

Validity and Reliability

It is imperative to know whether a study is 'truthful', meaningful and how well an idea 'fits' with reality (Neuman, 2011). In research, the concept of validity has proved to be a challenge to define within qualitative research: validity is usually defined within the scope of quantitative research. However, validity is an important factor even within qualitative research as it ensures "truthfulness" within that research interest. In qualitative research the researcher is more interested in the authenticity and 'truth' in the collected data, rather than realizing a 'single truth' (Neuman, 2011). In other words, the researcher does not believe that there is a single truth; instead the researcher wants to study people's accounts of reality, social life and perceptions. In this study, this was the theoretical foundation for conducting this research. In this context, validity is ensured by providing thick description of empirical data collected, making connections between volumes of data.

For the purpose and nature of this study, the concept of reliability is articulated in the following words by Morgan and 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*."

The research was consistent with the presented description of reliability. This chapter ensured that reliability was upheld in an orderly academic manner by making sure that a detailed methodological map of this research study is obtainable.

Ethical considerations

Since human beings are the objects of study in the social sciences, this brings its own unique ethical problems to the force which would never be relevant in the pure, clinical laboratory settings of the natural sciences. (Strydom, 1998: 23)

Addressing ethical issues is imperative when conducting research in the social sciences. When dealing with human being as the objects of study, the researcher must ensure that participants are protected against any form of harm. Participants can be harmed in various aspects when involved in research: in the case of this study the researcher had to ensure that participants were protected from emotional harm. Strydom (1998) proposes that participants can be harmed in a manner that is not obvious to both the researcher and participant, yet this can have far-reaching consequences. The nature of this study required that the participants be willing to be involved in this research, and be open to engaging in conversations pertaining to sexual encounters, HIV prevention methods, as well as HIV and AIDS in South Africa.

In this study, ethical consideration was important; firstly, ethical clearance was obtained from the UKZN Humanities & Social Science Research Ethics Committee, protocol reference number- HSS/0501/014M. Before the submission and approval of the ethical clearance, the researcher was required to present her research proposal before a panel of Professors and Doctors within the same discipline. Thereafter, the researcher refined the research proposal until it was suitable to submit for ethical consideration.

Every respondent who was involved in this research was also required to sign a consent form which stipulated what the research entailed. Attached to the front of the questionnaire was a consent form which articulated clearly the purpose of the research, what it required of the participant, as well as a section stipulating that the respondent should in no way feel obliged to answer questions they were not comfortable with answering. The consent form also explained that participants can, at any point decide to stop with their involvement in the research and this will in no way have disadvantages. A similar consent form was administered before the focus group sessions began, further seeking permission from the participants to be recorded.

Chapter 5: Quantitative data presentation and analysis

The purpose of this chapter is to encapsulate and present findings on female student's perceptions towards HIV prevention methods that are currently available, as well as microbicides. As explained in the methodology chapter, this study employed a mixed methods approach in collecting data, which comprised a questionnaire that was administered at the University of KwaZulu-Natal (UKZN) Howard Campus, as well at two focus group sessions that were also administered at UKZN Howard Campus. The questionnaires in this research study were administered to get preliminary data for the focus groups. In the first section of this chapter, data from the questionnaire will be presented and analysed.

This dissertation makes use of both quantitative and qualitative techniques' of approaching research. Moreover the study goes beyond conventional mixed method approaches of collecting and analysing data by adopting a liquid and unfixed approach. Govender (2013) refers to "blended research design", where methodologically, there is a mixture of rigid and flexible research processes: the research has embraced this notion by combining quantitative methods of collecting data with quantitative techniques of analysing data. The questionnaire is a qualitative technique of collecting data which was analysed using qualitative technique.

A total of 100 questionnaires were filled in by female students from UKZN, Howard Campus; however, some respondents did not answer all the questions within the questionnaire. The missing value range is very low and does not affect the overall results from the questionnaire. The tables presented in this chapter were developed from the data collected from the questionnaire.

Furthermore the data below is presented in a manner that reflects two major groups of female students; students living at home with their parents, and students living at a University residence or renting off-campus. This is to evaluate if there is a significant difference in perceptions towards HIV prevention methods from students living at home and those not staying at home. According to the Culture-Centred Approach, the context and space in which one is influences the behavior and lived experience of an individual, as well as their perceptions (Dutta, 2008). A total of 30 questionnaires were filled in by students residing at home with their parents, and 70 of the questionnaires were filled in by students living at a University residence or renting off-campus.

Demographics

Race group		
Black	70	70%
White	5	5%
Coloured	11	11%
Indian	14	14%
Total	100	100%

Table 5-1: Race distribution of research respondents

The questionnaire reflects the fact that majority of the students at the University of KwaZulu-Natal, Howard Campus are from the Black population. Seventy percent of the respondents who filled in the questionnaire are Black, fourteen are Indian, eleven percent are Coloured, and five percent are White. Research has proven that in South Africa, the Black population, especially females have the highest HIV prevalence rates (Shisana et al., 2014). It is therefore crucial that Black student's perceptions towards HIV prevention methods and developing HIV prevention methods are understood. However, this does not necessarily mean that the perceptions towards HIV prevention methods by other race groups are of less significance. Nonetheless, even though I employed convenience sampling, my sample representation is in relation to the UKZN racial breakdown. In 2012 it was reported that 64% of students enrolled are black

Students' preferences in regard to HIV prevention methods

Most trusted HIV prevention methods			
Students living at home with their parents		**Students living at a University residence, or renting off-campus**	
Male condom	10	Male condom	17
Female condom	0	Female condom	4
Ensuring your partner has had Medical Male Circumcision (MMC) and using a male condom	15	Ensuring your partner has had Medical Male Circumcision (MMC) and using a male condom	13
Only ensuring you partner has had Medical Male Circumcision (MMC)	0	Only ensuring you partner has had Medical Male Circumcision (MMC)	0
Abstinence	16	Abstinence	34

Table 5-2: Most trusted HIV prevention methods

Respondents were given an option of selecting more than one HIV prevention method that they trust the most. According to the data collected, abstinence is the most trusted HIV prevention method for female students. However, this may not be an indication that female students actually abstain from sexual intercourse, but rather, this reflects that most of the female respondents trust abstinence for HIV prevention. It was discovered later in the focus groups that even though female students believe that abstinence is an effective means of protection, they are sexually active. This notion confirms previous research that was conducted at UKZN which established that students do not believe that abstinence is a realistic HIV prevention method (Moodley, 2007).

The data also indicates that female students are aware that MMC on its own does not offer the necessary protection, with an almost equal number of students living on campus and with parents suggesting MMC with condom use offers better protection. The findings from this small sample also challenge the notion that women residing with parents or family at home were more likely to abstain than students living away from home. According to the data, the

female condom is generally not trusted by female students. In the group of students living at home, no one indicated that they trust the female condom as an HIV prevention measure.
The data indicates that women are more likely to consider the use of female condoms when residing away from home. However, of the group of female students residing on-campus or renting off campus, only four students indicated that they trust the female condom; this is a low number. This reflects the fact that female students do not trust the female condom, and is contrary to research that suggests the female condom is trusted by women and empowers women to protect themselves against HIV infection (Ogunlela, 2013). This is important data to consider when new HIV prevention technologies are developed: this data reflects the fact that some prevention measures may be perceived to be effective and empowering in theory, yet in reality people do not perceive the prevention method as trustworthy.

HIV prevention methods that are currently available are adequate?						
Students living at home with their parents			**Students living at a University residence, or renting off-campus**			**Total %**
Yes	19	63%	Yes	37	53%	56%
No	11	34%	No	30	43%	41%
No answer	0	0%	No answer	3	4%	3%

Table 5-3: Adequacy of HIV prevention methods

When students were asked if they thought that the HIV prevention methods that are available are adequate, majority of the respondents stated that available prevention methods are adequate.
Sixty three percent of students living at home believe that the available prevention methods are sufficient, while thirty four percent believe that prevention methods that are available are not sufficient.

Fifty three percent of the group residing on-campus or renting off-campus believes that the HIV prevention methods that are available are sufficient, while forty three percent believe

that the prevention methods that are available are not sufficient. This data reflects the idea that most students believe that the HIV prevention methods that are available are sufficient. However, it was later discovered in the analysis of the questionnaire that respondents felt that there is a need for more HIV prevention methods for women in particular. As discussed in *Chapter two*, HIV prevention methods for women are limited, and there is a need to develop HIV prevention methods particularly or women.

In addition, a significant number of respondents are not satisfied with the HIV prevention methods that are available (43% from the group of respondents residing away from home). This was an important finding because it validates research which claims that there is a need for more HIV prevention methods for women.

HIV prevention methods for women: enough is NOT enough

There is a need for more women controlled methods for HIV prevention						
Students living at home with their parents			**Students living at a University residence, or renting off-campus**			**Total %**
Strongly agree	17	57%	Strongly agree	34	49%	51%
Agree	8	27%	Agree	29	41%	37%
Disagree	4	13%	Disagree	2	3%	6%
Strongly disagree	1	3%	Strongly disagree	4	6%	5%
No answer	0	0%	No answer	1	1%	1%

Table 5-4: Need for more women controlled methods for HIV prevention

The table 5-4 shows that most of the female respondents feel that there is a need for more HIV prevention methods that can be can be controlled by women. Among the students living at home, fifty seven percent felt strongly that there is a need for HIV prevention methods that

women can control, twenty seven percent from this group also felt that there is a need for more prevention methods for women, thirteen percent disagreed with this suggestion, and three percent strongly disagreed.

The group of students living away from home showed similar observations; this confirms that generally female students believe that there is a need for more HIV prevention methods controlled by women. This is a key finding which confirms research that advocates a growing necessity for HIV prevention methods that empower women to have autonomy over their bodies and also have control over their sexual health (Tallis, 2012; Ramjee, 2011; Stein, 1990). Such research findings also uphold views that male condoms are not sufficient as the most effective HIV prevention method, as they rely on men's willingness and ability to use the condom (Kelly et al., 2015). There is a need for HIV prevention methods that can be controlled by women.

A point of significance is the fact that students previously indicated that they felt that HIV prevention methods that are available are adequate, yet when asked specifically about prevention methods for women, perceptions changed drastically with more students expressing that there is a need for more prevention methods for women. It is evident from these findings that female students believe that there is a need for more HIV prevention methods that are controlled by women. Above all, these finding confirm notions that have been established for more than two decades, namely that there is an indispensable need for HIV prevention methods that are controlled by women (Stein, 1990).

Female condoms = women empowerment?

Female condoms empower women because they place women in positions where they can negotiate safer sex.						
Students living at home with their parents			**Students living at a University residence, or renting off-campus**			**Total %**
Strongly agree	13	43%	Strongly agree	27	39%	40%
Agree	14	47%	Agree	25	36%	39%
Disagree	1	3%	Disagree	15	21%	16%
Strongly disagree	2	7%	Strongly disagree	2	3%	4%
No answer	0	0%	No answer	1	1%	1%

Table 5-5: Female condoms and women empowerment

Female students were undecided about their perceptions of the female condom. Contrary to what respondents indicated earlier in the questionnaire, most respondents feel that the female condom empowers women because it places women in position of negotiating safe sex practices. Forty three percent of the students staying at home strongly agreed that female condoms empower women, yet this group of respondents had earlier indicated that they do not trust the female condom as HIV prevention method. This suggests that regardless of the fact that women believe that the female condom can empower them by giving them the opportunity to negotiate safe sex practices; in reality they do not use the female condom, and they do not trust it as an effective prevention measure. These finding are consistent with the notions proposed by Lee (2001). Lee (2001) proposes that empowerment on an interpersonal level is important; he states that empowerment is a collective concept. Therefore, even if female students believe that female condom is empowering, this will not necessary translate to students trusting female condoms because the social and cultural context in which they are situated will directly affect whether they actually use female condoms. Students staying at university residents or renting of-campus showed similar trends.

Microbicides as new HIV prevention technologies

Female students who would use an HIV prevention product that contains an active ARV drug?						
Students living at home with their parents			**Students living at a University residence, or renting off-campus**			**Total %**
Yes	20	67%	Yes	42	60%	62%
No	9	30%	No	17	24%	26%
Not sure	1	3%	Not sure	11	16%	12%

Table 5-6: HIV prevention method containing ARV drug

Sixty seven percent of the students residing at home and sixty percent of the students staying at a university resident or renting stated that they would use an HIV prevention method that had antiretroviral (ARV) drugs. Students residing at home were more open to the idea of using an HIV prevention method that involves the use of ARV-based products. This key finding suggests that females are generally open to new HIV prevention methods, including biomedical prevention technologies. This finding maintains the trend that there is a need for more HIV prevention methods.

According to these findings, students residing at home are more likely to be open to the idea of using an HIV prevention method that contains an ARV drug. Students residing away from home proved to be more reserved regarding the use of an HIV prevention method containing an ARV drug, with more students in this group (30%) indicating that they would not use an ARV-based drug.

Between the tenofovir gel and the dapivirine ring, which of these two products would be more convenient to use?						
Students living at home with their parents			**Students living at a University residence, or renting off-campus**			**Total %**
tenofovir gel	15	50%	**tenofovir gel**	51	73%	66%
dapivirine ring	15	50%	**dapivirine ring**	16	23%	31%
Not sure	0	0%	Not sure	3	4%	3%

Table 5-7: Convenience of use – tenofovir gel and dapivirine ring

The respondents understood that both these microbicide products have not been licenced, and if product licensing transpires in the future, the likelihood is that they would have to be used in collaboration with a condom. When asked which microbicide they would use between the tenofovir gel and the dapivirine ring, overall more students chose the tenofovir gel *as* an HIV prevention method. The data shows that students staying at away from home are more likely to select the tenofovir gel for prevention rather than the dapivirine ring, whereas students staying at home are more open to considering use of the dapivirine ring. A driving factor for these findings is the fact that use of the ring is more discreet than the gel. Therefore students residing with family at home prefer an HIV prevention method that will not be seen by parents or family. From these findings, it can be established that adherences to a product can possibly be dependent on where people reside. An individual's context has a great influence on preferences, as well as adherence to a product.

The dosing strategy for the tenofovir gel demands more systematic user behavior: this can be a driving factor for students who state that this microbicide is not convenient to utilize. Past studies indicate that the dosing strategy for the tenofovir gel *is* one of the critical factors contributing to poor adherence to the product; studies suggest that women find it challenging to adhere to the dosing regimen of the gel. The recent FACTS 001 study established that most women who were part of this microbicide clinical trial study did not adhere to the study

product as instructed a finding which highlighted the great need to investigate women's different needs and preferences[13].

The availability of microbicides in a ring form has led some in the field of HIV prevention to perceive that there will be improved adherence to microbicides, compared to the gel (MacQueen et al., 2014; Dieffenbach and Fauci, 2011). This is largely because the ring has the potential to simplify the dosing regimen, and is less user-reliant.

In which other forms would you prefer microbicides to be available?						
Students living at home with their parents			**Students living at a University residence, or renting off-campus**			**Total %**
Injection	12	40%	Injection	29	41.4%	41%
Pill	14	47%	Pill	18	26%	22%
Cream	2	6.6%	Cream	15	21.4%	17%
None	2	6.6%	None	8	11.4%	10%

Table 5-8: Preference of other forms of microbicides

When asked which other forms women would prefer to have microbicides available, forty percent of the students staying at home selected the injection, forty seven percent chose the pill and six point six percent preferred the cream. Students residing away from home had similar, but slightly different preferences compared to students living at home. The data reveals that females residing away from home are more likely to choose the injection for HIV prevention, compared to those staying with family at home who would likely choose the pill. These findings are not definite determinants of which prevention method women prefer the most, but rather they reflect the notion that women's preferences towards HIV prevention methods vary. Understanding young women's' preferences towards HIV prevention methods is critical for the development of these biomedical technologies. When women's preferences are explored and studied, it will ensure that future microbicides will be relevant for women.

[13] http://www.aidsmap.com/Disappointing-result-for-tenofovir-gel-microbicide-shows-that-young-women-still-lack-HIV-prevention-methods-they-can-use/page/2948252/

Central to the CCA is the notion that health related issues involves shared meanings in socially constructed identities, relationships, social norms and structures (Dutta, 2008). Therefore, according to the CCA, exploring women's' preferences towards microbicides is an important development step towards a future microbicide product.

Microbicide characteristics are important when studying attitudes, acceptability and preferences; women's needs and preferences are different, and developing HIV prevention measures should address these various needs. Therefore while developments in new microbicides are being made, it is vital to understand that women's preferences vary. Furthermore, it is important to note that because preferences in HIV prevention methods vary, the issue of uptake and acceptance towards microbicides will depend also on women's preferences.

Research suggests that development of relevant and effective microbicides depends on understanding women's preferences in various microbicide characteristics (Hammett et al., 2000). Lessons from the introduction of female condoms also lead to this understanding: just because there is a new HIV prevention method for women, does not mean it will be used (Hammett et al., 2000). Therefore, in keeping with these result, the high interest in having microbicides available in an injection form should be taken into consideration as development of effective microbicides is still underway.

Knowledge about microbicides

Students who had some degree of knowledge regarding microbicides prior to this questionnaire.					
Students living at home with their parents			**Students living at a University residence, or renting off-campus**		
Yes	10	33.3%	Yes	33	47%
No	20	67%	No	35	50%
No answer	0	0%	No answer	2	3%

Table 5-9: Degree of previous knowledge regarding microbicides

The table 5-9 reveals that most respondents did not know about microbicides prior to the administration of this questionnaire. Sixty seven percent of the students residing at home, and fifty percent of the students residing away from home indicated that they had not known about microbicides prior to the questionnaire. The high percentage of students who did not know about microbicides prior to this questionnaire serves as a limitation to this study, and has been discussed in the previous chapter.

It was discovered that students residing away from home are more likely to know about microbicides compared to students living with family at home. Even though microbicides are still in their developing phases, students residing at University residents indicated that they had some level of knowledge about microbicides prior to the questionnaire. This indicates that students residing at home are not as well informed about HIV prevention methods as students living in University residences.

Summary

The questionnaire shows that most students do not know about microbicides. The endorsement of microbicides as HIV prevention methods that have the potential to empower women has been low thus far. The lack of knowledge towards microbicides among female

students indicates that information on microbicides is not easily available. Recent studies indicate that marketing microbicides will be critical in order to avoid stigmatization of the product, as well as promote acceptance of microbicides (Ryan et al., 2015). Understanding these dynamics may contribute to effective introduction of microbicides when they are licensed and available.

Preliminary data from the questionnaire established some key findings about the sample's perceptions towards HIV prevention methods that are currently available, as well as microbicides. Perceptions towards HIV prevention methods varied between the two groups of students (those residing with family at home, and those living at UKZN residences or renting).

It was noted that the male condom was the most trusted HIV prevention method, but the questionnaire data then revealed that female students were discontented with the male condom only. Overall, female students clearly expressed that they were not satisfied with the HIV prevention methods that are available. However, even though students stated that the HIV prevention methods that are available are adequate, there is a need for prevention methods for women in particular. This finding is derived from respondents' indication that there is a need for more women-controlled methods of protection, suggesting that female students are open to new HIV prevention methods designed for women.

Key findings from the questionnaire data included the fact that a higher percentage (62%) of female students asserted that they would use microbicides if they were available as HIV prevention methods; furthermore 66% of the female students stipulated that they would prefer using the tenofovir gel as opposed to the dapivirine ring.

Moreover, alternative forms of microbicides that were preferred by female students included an injection and a pill. It thus is stated by the researcher that this affirms the notion that there is a need for microbicides to be available in several forms to suit the different needs and preferences that women have for HIV prevention methods. Research studies conducted in South Africa suggest that microbicides will meet diverse needs which go beyond those that have been identified, therefore this calls for microbicides to be made available in various forms to meet various needs as well as preferences (Orner et al., 2006). The following chapter presents in-depth and comprehensive data on these key findings.

Chapter 6: Qualitative data presentation and analysis

Introduction

In this chapter, research findings from two focus group sessions will be presented, analysed and discussed with the purpose of addressing the key questions and objectives of this dissertation, as well as discussing emerging findings from the research. Focus group A comprised female students who lived at the UKZN residences or who rented an apartment, focus group B only included female students residing at home with their parents. For the purpose of this dissertation, the researcher also sought to investigate whether context was an important factor in student's perceptions towards HIV prevention methods, and preferences in microbicides. In qualitative research, data analysis entails the segmenting of data into relevant categories with which the researcher can work in order to make relevant elucidations of the data. This process of segmenting the data into relevant categories was done through a method referred to as thematic analysis. Thematic analysis was employed for the purpose of data analysis, drawing themes from the rich data and conceptualising the findings.

The themes include; (1) *female student's perceptions towards HIV prevention methods*, (2) *female student's attitude towards microbicides as HIV prevention methods*, and (3) *female student's attitudes, preferences and acceptance of the tenofovir gel and the dapivirine ring*. (4) *gap between knowledge and behaviour in HIV prevention*, (5) *power dynamics in HIV prevention*, (6) *cultural issues*. These themes will be discussed in a comprehensive manner, focusing also on the interactive processes within the focus group sessions.

Focus groups as platforms for dialogue

The theoretical framework that informs this dissertation is the Culture-Centred Approach (CCA). This study is established on the theoretical notion that health promotion programmes must be designed and implemented to suit a particular context according to its cultural prescriptions within that context. The process of engaging in dialogue with the cultural members of a particular context to gain their perceptions, understandings and attitudes of health-related issues is central to the CCA. The CCA seeks to give space to those who are marginalised, a platform to voice out their perceptions, attitudes, values and opinions on issues of health (Dutta, 2008). In keeping with this, the CCA encourages the researcher to

engage in dialogue where they gain a sense of understanding of the community's perspectives and how health meanings are constructed (Dutta, 2008).

The development of new HIV prevention methods is not exempt from this; the CCA advocates that such health developments should include the voices of the members of the community. Professionals within the field of microbicides have articulated that there is a necessity to engage women in conversations about microbicides in order to facilitate an effective introduction of this HIV prevention method once it becomes available (Lanham et al., 2014). For the purpose of this study, the researcher implemented these theoretical pillars by conducting focus group sessions with female UKZN students. The focus groups served as platforms whereby young women could engage in dialogue, expressing their attitudes, values, preferences and perceptions towards HIV prevention methods, and more specifically towards microbicides as developing HIV prevention methods.

Recent studies have suggested that there is a need for social scientists to investigate factors that may contribute to the acceptance, uptake, and adherence of microbicides as HIV prevention technologies (Kelly et al., 2015; MacQueen et al., 2014). It then becomes essential that the perceptions of those who will potentially use microbicides are ascertained. The CCA suggests that by giving a 'voice' to those who are central to the health development; the people at grass-root levels, and the stakeholders, promoting health-related issue will be more effective and relevant (Dutta, 2008). In the context of this study, UKZN female students' perceptions towards microbicides as HIV prevention methods are investigated in a culture-sensitive approach. This was done with the aim of establishing findings on women's attitudes and possible acceptance levels towards microbicide products, within the KwaZulu-Natal University context.

The focus group sessions were approximately three hours in duration; the facilitator ensured that the setting in which the focus group session was taking place was a private, casual and relaxed environment for the participants, given the sensitivity of the topic. This was a very important element for the researcher, as it was necessary to make the participants feel as comfortable as possible. Creating a space where people feel safe and free to express their opinions as openly and honestly as possible was important for this study, and therefore the researcher did this to the best of her ability.

Female condoms- a parallel to microbicides

The questionnaire that was administered led the researcher to the understanding that female students' perceptions towards HIV prevention methods are different, showing diversity in perceptions. Female students used the focus group sessions as a platform to share information and perceptions of HIV prevention methods. In both focus groups, participants displayed a high level of knowledge about HIV prevention methods; this finding corresponds with findings from the questionnaire.

Endorsement of female condoms- problematized

Participants expressed that their concern about HIV prevention methods was that there are not enough methods of prevention available; additionally, participants expressed their beliefs that the male condom is the most promoted HIV prevention method. During the focus group session, participants strongly expressed the concern that even though there are female condoms, they are not promoted and are not as easily accessible as the male condom and therefore, many people do not know about the female condom as an effective HIV prevention method.

> Respondent 1: *"Again I feel like when it comes to female condom, there's so much of, there's no advertising, marketing for it. It's just like 'ok if you know about it then you will go and get it' and you know..."*

> Respondent 2: "*So we just trust male condoms and people are just so comfortable using males condoms, they came first and they were advertised. So much that they don't even sell female condoms, you get them for free. So how unreliable is that? You know, my status and everything, so I'm not going to go to a clinic and pick a female condom. Whereas a male I go to the store and I buy it, whatever type brand whatever. And another thing, male condoms there are so many. They flavoured they this they that. Females it's just that one. I'm not going to trust that."*

The female participants in focus group B felt that male condoms are the most trusted and used HIV prevention method because they are the most promoted, easily available, and they were introduced before the female condom. Most of the participants also expressed that they trusted the male condom more than the female condom. These findings verified findings from

the questionnaire where it was noted that the female condom was the least trusted method for HIV prevention (see data from questionnaire). Consistent with previous research (Ogunlela, 2013; Tallis, 2012), the majority of respondents felt that there was a definite predisposition against the female condom, and the lack of endorsement and accessibility to female condoms confirms this notion.

In focus group B, there are similar findings: male condoms are perceived as HIV prevention methods that can be trusted because they are endorsed and easily available. This strongly suggest that in order for HIV prevention methods to be trusted, accepted and used, there will be a need for health communication campaigns that will introduce, educate people and promote the use of an HIV prevention method. Research has highlighted this point by establishing that there is a positive correlation in the "promotion of a product" and "positive perception" linked to that product (Mantell et al., 2005). Mantell et al. (2005) propose that inadequate attention to the design, packaging features, overall product marketing, and poor introduction plans may result in low levels of acceptance of a particular product.

In support of the above, recent research on microbicides has established that marketing microbicides will be critical in avoiding stigmatization of the product, and that creating a platform for product-awareness will be a necessary prerequisite in the acceptance and uptake of microbicides (Ryan et al., 2015). Lessons must be drawn from women's perceptions of current HIV prevention methods in order to aid the successful introduction of new HIV prevention methods. Lastly, research conducted in South Africa supports these findings: it was discovered that community members in a particular context wanted detailed information about microbicides; they highlighted the need for product-awareness, as well as a widespread of product accessibility (Orner et al., 2006). On this point, the CCA encourages that development of a health product must include the articulations of those who are potential users, those who are at the grass root levels in order to address potential problems related to the product being developed (Dutta, 2008). Therefore, taking into consideration these findings will be beneficial for the development of microbicides as HIV prevention methods.

Availability and accessibility of the female condom- barriers of prevention

The comments by the respondents echo the fact that the male condom is the most trusted HIV prevention method, whereas the female condom is perceived to be ineffective. This discussion traced the difficulties faced by females regarding HIV prevention methods. The

notion that female condoms are ineffective can be linked to the fact that the female condom as an HIV prevention method is not promoted; many people do not know where to get female condoms, or how to use the female condom. A study conducted at UKZN (Howard Campus), in 2013 established the same findings regarding female condoms, namely, that availability and accessibility of the female condom is a challenge that women face (Ogunlela, 2013).

> Respondent 1: "*there is not enough stuff out there. Is it [female condom] promoted as much as the male condom is being promoted?*"
>
> Respondent 2: "*ok, I only know of the female condom in terms of preventing females [HIV prevention]. Apart from the… I think it's not effective, in the sense that uhh, because females also need the consent of their partners when uhh, in terms of a prevention. So it's not effective in that sense*."
>
> Respondent 3*:* "*People don't know how it works!*"
>
> Respondent 4: "*I know exactly how! My gynecologist has gone through it with me. She's gone through the twisting and inserting… but have I actually…? I've asked about it* [female condom] *once in a chemist and they said they didn't have it. I've seen two adverts in the past, I'd say in the past 5 years. I will speak about it because I love tracking what people are talking about. People look at me with a blazed over look; there are female condoms IN THE WORLD!"*

These findings also confirm the assertion that Tallis (2012) established, which states that one of the major limitations of the female condom as a women-controlled method of protection is that it is distributed at a far lower scale than the male condom, and it is expensive. The lack of promotion and availability of female condom is reflected by the following findings; in 2009 only 5 million female condoms were distributed in South Africa as opposed to the 450 million male condoms that were distributed in the same year (Tallis, 2012). According to the Empowerment Theory, empowerment involves enabling people to gain access over resources, information, choices and opportunities so that they are able to improve their current situation (Pettit, 2012). If female condoms are not made available or easily accessible for women then female condoms will inevitably fail to empower women because empowerment involves giving people access to resources.

Female condoms- Fe[Male] empowerment?

Respondent 2 also noted a significant limitation of the female condom and that is the fact that even though the female condom is a women-controlled method of protection, it still requires negotiation and consent from one's partner. This is a serious limitation to the effectiveness of the female condom: even though this prevention tool is essentially designed for women, it still requires consent from a sexual partner. The female condoms effectiveness therefore depends on the willingness of one's partner to agree. This finding is consistent with other studies that have established that the use of the female condom still demands that women negotiate use with their male partners (Van Devanter et al., 2002). Therefore the female condom is not essentially "female controlled". Women need prevention measures that will empower them to initiate safer sex practices that do not necessarily need consent from their sexual partners. Rapport (1984) advises that empowerment strengthens people's competencies: for women this means that there is a need for HIV prevention methods and technologies that will enable women to protect themselves from HIV infection.

Another barrier in the use and perceptions towards the female condom is that many females do not know how to use it. Regardless of the fact that these participants are all at tertiary level of their education, most of them were not aware how to use a female condom. Not being able to use the female condom can also be said to be a contributing factor in the negative perceptions towards the female condom. Overall, from focus group A and focus group B, no one expressed positive perceptions towards the female condom.

> Respondent 1: "*I think there is a stigma attached to female condoms. The fact that we don't have female condoms available in different sizes. They don't have them in different sizes you know as if saying that all female vaginas are big."*

This statement confirms the finding of a study conducted at UKZN (Howard Campus) in 2013 which established that the size of the female condom was a challenge in the acceptance and use of the female condom by female students (Ogunlela, 2013). Factors such as the form and appearance of a prevention method therefore play a critical role in its acceptance and uptake by potential users.

Male condom- tried and trusted

The discussion concerning HIV prevention methods developed questions for the researcher regarding other prevention methods that were not mentioned or considered by the

participants. HIV prevention methods are not limited to female and male condom use for every sexual encounter, rather there are also other available means to decrease the chances of HIV infection such as: ensuring that your partner has undergone MMC, frequent testing and abstinence from sexual intercourse. These findings suggest that for some females, the only means of HIV prevention that they consider is the use of male or female condoms. This contradicts findings from the survey, where a significant number of participants indicated that "abstinence" was the most effective means of ensuring protection against HIV infection. However, it must also be taken into consideration that one of the driving forces behind this is that research has established the fact that the condom is the most effective. The male condom has shown to be 95% effective when used consistently and correctly, and 70% effective when not used consistently (Ramjee, 2012). This may be a driving force behind the high level of trust people have for the male condom.

The discussion surrounding perceptions of HIV prevention methods was dominated by negative understandings about the female condom. Discussions surrounding the female condom continued for longer than the researcher had planned or anticipated; this displayed the high level of distrust and frustration that participants have towards the female condom. At this point, the researcher had to introduce another point for discussion in order to halt the participant's over-focus on the female condom. This was common in both focus groups. This underscores the need to understand what constitutes an empowering HIV prevention tool for women, so that developing female-initiated prevention may be effective

Female students' perceptions towards microbicides

Since 1987, advocates for microbicides as HIV prevention methods that women can use, have been working tirelessly to draw attention to the need to develop HIV prevention methods that can be used by females (AVAC, 2015).

More prevention methods for women = More women empowerment

The focus group sessions conducted during this research, as well as the questionnaire conducted reaffirm the notion that there is still a great need for HIV prevention methods that can be "controlled" by women, and that do not need the consent of their male partners. A respondent from focus group A expressed the following sentiments regarding this discussion:

> Respondent 4: "*but they're* [female condom] *not out there as the male condoms. For me, that automatically says it's the man… the man! You're still giving him the power…*"

This respondent expresses frustration at the lack of HIV prevention methods that women can use, she highlights an important element and that is the concept of power dynamics in HIV prevention methods. The concept of 'power dynamics', as well as 'gender-related issues' in HIV prevention methods emerged as important themes within the data, which will be discussed below. This particular respondent brings out the important point that there are no HIV prevention methods that give women the power; rather, there are prevention methods that "give him [men] the power". The Empowerment Theory asserts that health interventions that are oriented around empowerment will enhance the wellbeing of individuals while aiming to solve problems and provide opportunities for those previously disempowered i.e. vulnerable (Perkins and Zimmerman, 1995). Therefore, HIV prevention methods that aim to empower women need to not only address the issue of giving women power, but also the problems pertaining to HIV prevention for women, including male dominance.

Microbicides have been proposed as biomedical tools that women can utilize to protect themselves against sexually transmitted diseases, more especially HIV. These biomedical technologies promise to give women some degree of autonomy, by giving them an HIV prevention measure that does not necessarily need the consent of one's sexual partner. Within the South African context, where unequal sexual power is common, this prevention tool has the potential to address key problems within HIV prevention because many women are subjected to sexual relationships where they have little or no voice to negotiate safer sexual practices with their male partners (Chersich and Rees, 2008).

Several microbicides have gone through clinical trials to test effectiveness and safely in protecting women against HIV infection during sexual encounters. The focus group discussion was based on the fact that there are limited studies in KwaZulu-Natal that investigate female perceptions towards microbicides as HIV prevention methods. The questionnaire conducted during this research shows that over 60% of the participants indicated that they would use a microbicide product as an HIV prevention method.

Covert use of microbicides

Female students showed a high level of interest in microbicides as an HIV prevention method. The female students who were part of focus group B expressed that they believed microbicides are relevant. These findings confirm those of previous studies conducted in South Africa (Orner et al., 2006). Several factors emerged as motivation for female students to be optimistic towards the use of microbicides. The covert characteristic of microbicides appealed greatly to participants in the focus group.

> Respondent 1: "*I think these products are relevant because it like, unlike a female condom, it's discreet*"
>
> Respondent 2: "*I also think they are relevant because no one knows, it's my little secret. Like I'm not going to tell people, so then I can actually use it and my boyfriend won't know about it…*"
>
> Respondent 3: "*I also think both* [the tenofovir gel and the dapivirine ring] *are relevant provided that awareness comes with it because what's the point of them being approved in South Africa, or in the medical world or whatever you call it and yet we don't know about it*."

According to these three participants, microbicides are relevant HIV prevention methods because they can be used covertly. There may be several contributing factors as to why participants said microbicides are relevant, one of these factors being the element of "being discreet". An interesting discourse emerged from this discussion, and that was the notion that females have the option of not disclosing to their partner or anyone else that they are using a microbicide as an HIV prevention measure. More than two participants expressed that they felt like microbicides were relevant prevention methods for women because women would then have the option of not telling their partner about using the product.

However, it must be acknowledged that one of the limitations of focus group sessions is that a participant's views may influence the views of other participants who may have disagreed with a notion initially. The notion of being "discreet", "secretive" and "private" can be associated with the understanding that females need an HIV prevention method that does not require their male partner's consent. Most of the participants were impressed with the covert

use that microbicides could offer. Given that in the South African context, women generally have negative experiences of negotiating safe sex practices with their partners, the covert characteristic of microbicides seems even more appealing. Other studies have discovered that women prefer to use microbicides covertly for various reasons including: fear of partner, fear of stigmatization, and fear of appearing untrustworthy (Terris-Prestholt et al., 2013).

Stein (1990), made the contributing understanding that development of HIV prevention for females should consider several factors: will the female find motivation of applying the barrier before every sexual encounter? Will their partners notice the barrier device and if so will they accept the introduction of this barrier method? The discussion in the focus group supports the importance of points made by Stein (1990). The context of a relationship will determine whether women are comfortable with disclosing the use of a microbicide, and this is a crucial factor that will influence acceptance, uptake and adherence to microbicides as HIV prevention methods.

However, there were participants who questioned the notion of using an HIV prevention method without the knowledge or consent of their sexual partner, or keeping it a secret. One of the participants from focus group B stated:

> Respondent 1: "*And also, should come with women being acceptable in taking a stand in protecting themselves. Why must I be discreet about the fact that I'm taking the V-gel? Why must I be discreet about the fact that I'm using a female condom? Why would I be shunned upon if I'm in the female bathroom and I take a female condom? For males it's acceptable but for females it's like...*"

In focus group A, a similar concern surfaced:

> Respondent 2: "*I want to talk about that the female would use it secretly without her partner knowing, I think already that could be an issue in relationships. The partner might assume that you are cheating on them if they find it. Maybe not communicate it that way ukuthi* [that] *we know that you guys don't really have an option in the relationship but rather place a value on the fact that it's good for him and it' good for you as opposed to saying "hide this!" place it in a way so that it doesn't come with an attachment of 'you have to lie to your spouse"*"

These two participants raised important points that need to be addressed when developing HIV prevention methods for women. The first respondent expresses her sentiments against the notion of keeping the use of a microbicide a secret; she raises the question of why women should even be in a position to look for HIV prevention methods that can be kept a secret. In the light of this question, it is evident that there are women who are in sexual relationships where their partners would forbid the use of products such as microbicides, therefore using the product covertly should be an option for women who would prefer to do so.

Overall, the option of covert use of microbicides should be left at that, simply an option for women. Women have variable sexual relationships; the option of using microbicides should depend on the dynamics of the relationship. Most importantly, there are studies that have established the fact that the type of microbicide formulation will directly affect the feasibility of using the product covertly (Lanham et al., 2014). For example, the lubrication properties of the gel be might be more noticeable to one's sexual partner than the ring (Lanham et al., 2014). Furthermore, the packaging and storage of the product will affect whether women can use the microbicide covertly: in the case of the gel, the quantity that women may need to store for use can become a hindrance in using the product without the partner's knowledge.

Involving men in wo[men] empowerment

When discussing perception surrounding microbicides as an HIV prevention method for women, an interesting suggestion was made by one of the participants in focus group A:

> Respondent 1: "*Can we have… it's just a thought. What would happen if microbicides are… let's say it's a man's responsibility to carry microbicides for you? Guess what? We would all use them.*"
>
> Facilitator: "*huh, do you think so*?"
>
> Respondent 1: "*yes!*"
>
> Respondent 1: "*trust me! Because if it is Tom who is bringing the microbicide then we will all use them.*"

Respondent 2: "*No she right. Because it's like the condom, every time it's always, "do you have it" the guy will never ask you. Yeah the guy will never ask you to bring a condom as a girl. Never, because he knows that the responsibility is on him*."

Contrary to what participants had been expressing about the great need for HIV prevention methods that women can initiate and control without the consent of their partners, these two participants felt that the support of men in ensuring acceptance of microbicides is important. Respondent 2 mentioned that the responsibility of carrying protection is placed on men. This statement is accurate when looking at the condom as an HIV prevention method, there is a general notion that it is men's responsibility to carry a condom.

Research, as well as findings from these focus group sessions indicates that generally women place the responsibility of carrying a condom on the man within a sexual relationship; these are gender-related social norms (Weiss et al., 2000). The notion of placing the responsibility on the male partner to initiate safe sex practices is a socially constructed notion. This key finding confirms recent research to the effect that partner disclosure about microbicides will influence acceptance, uptake and adherence to microbicides (Kelly et al., 2015; Gafos et al., 2013; Lanham et al., 2014). Consistent with this understanding is the fact that during the CAPRISA 004 clinical trial, it was discovered that partner disclosure about microbicide use showed a modest increase in adherence to the clinical product (Mngadi et al., 2014).

Several studies also confirm that partnership dynamics are significant in acceptance and adherence to microbicide by women (Kelly et al., 2015). Therefore, even though microbicides are hailed to be 'women-controlled', support from a sexual partner will encourage acceptance and adherence.

Interestingly, most participants felt that the responsibility of carrying protection or initiating an HIV prevention method should be shared; there should not be social recommendations that discourage women from being part of this process. At the beginning of this focus group session, a respondent discussed the notion of men having the responsibility of carrying a condom and being the initiators of HIV prevention options:

> Respondent 1: "*if we look at former campaigns or just interventions from the past, responsibility has commonly been placed on the males. So for them to always have the responsibility of carrying a condom around or some sort of a preventative method with them… And I think if the emphasis is going to be shifted now from men taking responsibility unto women, then there should be a body of knowledge that would meet that sort of gap that has been identified.*"

The above statement introduces an interesting contradiction in the participant's perceptions towards HIV prevention methods. This respondent echoes the need for HIV prevention campaigns or programs that will inform and educate people about female responsibility in HIV prevention. This respondent argues that HIV prevention campaigns have previously emphasized that men should take responsibility of carrying a condom. Most of the participants in both focus groups strongly expressed that women should have the platform to be catalysts in the HIV prevention options within their relationships; only two participants expressed otherwise.

Microbicides in different forms -A wider variety that will address various needs

Microbicides should be available for women in various forms. Participants from focus group A expressed the desire to have microbicides available in various forms and not just available in a gel, or ring form.

> Respondent 1: "*I don't think it's a bad idea to have it if you have it in various forms, so again it's that thing of your preference. So the reach is much wider. Some people don't like injections, and some people don't even donate blood because of the needle. They know it's necessary to do it but they don't do it because of that process. So I think having it* [microbicides] *in various forms will help them reach… and make their reception better*."

Participants supported this statement; they echoed that the introduction of microbicides as HIV prevention methods should be available in various forms to suit women with different needs and preferences. This leads to the issue of there being a need for HIV prevention methods that are context specific; this issue emerged as a discursive theme, and will be discussed. In keeping with current research, these findings affirm the notion that there is a

need for a several forms of microbicides to be made available to meet the various preferences that women have towards HIV prevention methods.

A serious question was raised regarding the relevance of microbicides. A respondent from group A raised a question of whether microbicides as an HIV prevention method for women, was a true reflection of the current problems in our society:

> Respondent 1: "*Even though the emphasis is on the problem and not the solution, do you think that the solutions are a real reflection of what the problems are? Like these, these…*"
>
> Facilitator: "*microbicides*?"
>
> Respondent1: "*yes, these microbicides, yes, are they really going to be practical? [*are microbicides*] really reflecting what's going on*?"

A concern regarding the development of microbicides was raised by one of the participants who questioned whether microbicides are relevant, and whether these biomedical tools reflect problems concerning HIV prevention. This concern is related to questions of whether microbicides will address the underlying problems such as unequal gender-power relations, and complex socio-cultural issues which exacerbate women's disproportionate vulnerability to HIV infection.

Overall, females from both focus groups articulated that they would use microbicides if they were available. Generally, findings from this small sample reflected positive perceptions towards microbicides as HIV prevention methods. The first point was that the participants felt that microbicides are relevant HIV prevention methods for women. Also, the option of being able to use the microbicides discreetly and without the consent of a sexual partner appealed greatly to most focus group participants. There was a suggestion however that the acceptance levels of microbicides could be higher if these prevention measures were introduced by the male partner in sexual relationships. Then there were suggestions that microbicides should be introduced and available in several forms to suit women with different needs and preferences.

Research studies on women's preferences towards HIV prevention suggest that placing a variety of options for women to protect themselves against HIV infection will be an effective

way to curb the HIV and AIDS epidemic. Studies that focus on females perceptions towards microbicides are insufficient.

Female student's attitudes, preferences and acceptance of the tenofovir gel and the dapivirine ring

At the beginning of the focus group, the facilitator introduced and showed the participants the tenofovir gel and the dapivirine ring. Prior to the focus group, the participants had not seen the tenofovir gel and the dapivirine ring, so this was an opportunity for the participants to see and feel two microbicide products. Additionally, the facilitator explained how each of the products are used and applied, also explaining the differences between the dapivirine ring and the tenofovir gel. The participants were given an opportunity to ask questions concerning the use of the two products; the facilitator addressed the questions, while emphasizing the point that both the products are still undergoing clinical trials.

Dapivirine ring – the "practical option"

Perceptions towards the dapivirine ring varied among respondents. When the facilitator asked the respondents which of the two microbicides do they think is the most practical for them to use, all participants in group A, responded that the dapivirine ring would be the most practical form of HIV prevention for them. The time frame in which one can have the dapivirine ring was perceived as the most appealing characteristic. The respondents said that it was convenient and practical to have an HIV prevention method that could last up to three weeks. Discussions from focus group A involved the following:

> Respondent 1: "*I say the ring because firstly the time frames for the ring…with the ring there's that three week period. There is no planning of in an hour or two or twelve, you have to be prepared and what-not. You just consciously know as a woman that it's 3 weeks now*"

> Respondent 2: "*We have to be practical about it. Now I'm saying I love the ring because it's practical, it makes more sense to me as a female*."

The dapivirine ring was seen to be a "practical" method of preventing HIV infection. According to discussants, their idea of being "practical" involves the convenience of being able to have an HIV prevention method that can last for a longer period. Moreover, it was stated that the ring is practical because they would not have the burden of having to remember and adhere to the product for every sexual encounter, but rather they would only have the responsibility of remembering to insert a new dapivirine ring after three weeks. The issue of having a prevention method that is convenient came up as a major theme, and will be discussed below.

Research studies strongly suggest that the development of a long-acting ARV based ring may facilitate better adherence to microbicides, as they require less user behavior compared to the gel (MacQueen et al., 2014). Studies also show that women may prefer the use of a ring due to its simple application process: this is supported by the findings from this small sample (Hardy et al., 2007).Furthermore, a ring will be easier to store without one's partner noticing, since women will only need one ring every three weeks. All of these factors contribute to perceptions that the ring is "practical" as suggested in the focus groups.

In focus group B, similar comments were made about the dapivirine ring:

> Respondent 1: "*I think the ring would be more, I don't want to say convenient but, more like... easier to adhere to* [Facilitator]…"

Discussants in both focus groups said that the dapivirine ring was the most convenient to use because it offered protection for a longer period. Adherence to the dapivirine ring was perceived by the students to be easier. This point is very relevant because research shows that one of the greatest challenges faced by women in microbicide clinical trials is the issue of adherence to a product. In a clinical trial study- FACTS 001, it was discovered that more than fifty percent of the females enrolled in the study failed to adhere to the study product, which then affects the effectiveness of the product (CONRAD, 2015). However, the positive responses towards the dapivirine ring contradicted data revealed by the survey. The questionnaire showed that from the female students residing at UKZN residences, only 23% stipulated that they would prefer to use the dapivirine ring. It was discovered from the questionnaire that students residing at home were more likely to prefer using the ring.

Healthcare services- a barrier to prevention

The issue of healthcare workers on the use of HIV prevention methods was an interesting point raised during the focus groups. A few participants indicated that if using the dapivirine ring involved going to the clinic to get the ring inserted, then that would be a point of discouragement. Some of the focus group respondents expressed that their previous experiences of going to the clinic to get help regarding birth control and HIV prevention measures were not pleasant. The statement below clearly depicts the level of distrust that female students have towards clinic nurses, to the point of affecting their perceptions. This key finding also confirms suggestions made by previous studies; that products that required multiple trips to the clinic would be unlikely to be used as compared to other methods of prevention (Tanner, 2008).

Participants in focus group A raised some concerns regarding the use of the dapivirine ring:

> Respondent 1: "*Now, disadvantages of the ring; if I have to go see sister whoever, I don't want to mention names, there by the clinic, who judges you when you go because you have a painful abdomen….The minute you say I have to go and see that lady [a nurse]; I'd rather not use those. Can you get trained on how to use it on your own rather than having to go to the clinic? Then I can buy and use two in two months. It's empowerment! I would be empowered because I'm doing it myself. So then TRAIN ME THOROUGHLY SO I DO NOT HAVE TO GO THERE. Then tell me how I'm going to take it off, you know what I'm saying? Then let's look at that. It's super...*"

Tenofovir gel - challenges in adherence

When discussions concerning the tenofovir gel as an HIV prevention method arose, a common trend for both focus group sessions was evident; most of the female participants expressed their anxieties about the dosing regimen of the tenofovir gel. When introducing both the ring and the gel to the respondents, the facilitator explained the dosing regimen for the gel. The CAPRISA 004 before and after dosing strategy is referred to as BAT- 24, the gel is applied 12 hours before anticipated sexual intercourse and within the next 12 hours after sexual intercourse, with a maximum of two doses within a 24 hour period (CAPRISA, 2010).

When asked if the students would consider using the tenofovir gel as an HIV prevention method, one of the respondents issued this comment:

> Respondent 1: "*I think I'd honestly forget to put the gel on, like for real, I'd forget.*"

The concern for this respondent is the issue of adherence to the product; she states that she would forget to use the gel. Prior research on the issue of adherence to microbicides in a gel formulation suggest that this is a serious problem, which in clinical trials can influence the product's effectiveness in preventing HIV infection (Abdool Karim et al., 2010). If people do not use microbicides as instructed, the product will not be effective; therefore the product formation is important when considering acceptability (Venables and Stadler, 2011).

One of the respondents from group A questioned whether the use of the gel was practical, particularly in rural areas:

> Respondent 2: "*So in Northern KZN these men are dominant in their households, they want to have sex and I don't know, but I just have that perception that they want to have sex whenever. So what happens when the guy is coming back home from work and you haven't applied the gel. Is it practical?*"

This comment echoes concerns about adherence to the gel: students questioned whether women would be able to adhere to the gel because of the strict application regimen. This respondent is questioning whether using the gel would be practical in an environment where women are not aware when they will engage in sexual intercourse with their partners in a context where men can demand sex from their female partners at any given time, leaving the woman unaware when to apply the gel.

Tenofovir gel - for a particular woman

There were students from group B who suggested that the gel would be more practical for a particular type of woman:

> Respondent 3: "*But I also think it's for your very disciplined woman. Disciplined in the sense that, you know you get women that are very structured in their lives. 'I am the director of Anglo- American, my time is from 8am in the office to 6pm I know*

Monday, Wednesday and Friday I'm going to go see my man from 8 o' clock till 10pm'. Life is structured."

Because of the strict application regimen, this respondent suggested that the gel would be more likely to be used by women who have 'structured lives'. It became evident that the characteristics of the microbicide products are very important, and that their characteristics would appeal to the needs and desires of different women.

Similar points were raised in focus group A:

Respondent 1: "*I think that the gel would be used by married women*."

Respondent 2: "*I agree*"

Respondent 1:" *because married women have a routine. Your husband is already a person… I mean he's your husband! You know him. He can even be there while you do it. Do you understand?"*

During the focus group sessions most of the female students clearly stated that they would prefer to use the ring as opposed to the gel because the application regimen for the gel appeared as a challenge.

Power dynamic in HIV prevention methods

During the focus group discussions "power dynamics" were identified as important factors in HIV prevention. Gupta (2000) suggests that power dynamics are fundamental issues that underlie gender and sexuality, and the focus group sessions proved to support this notion. Participants associated having access to HIV prevention methods such as the condom as being "given power":

Respondent 1:"*If you look at campus bathrooms, there are condoms for men. Why aren't these condoms for females? To me it's like we educate, we give the men the power. Yes I know it sounds feminist, probably my feministic tendencies coming out*

but I feel like we still give men the power to determine whether or not safe sex can happen for us or not."

Students from focus group A, noted that female condoms are not as easily accessible as male condoms are; specifically they highlighted the fact that, unlike male condoms, female condoms are not available in campus bathrooms; this fact was aligned to gender-power relations. The fact that male condoms are available for men was directly linked to giving men power. The argument presented here was that women lack power, women lack access to the female condoms, this was conceptualised as evidence of women 'not having power'. This particular respondent concluded that men are given power to determine safe sex practices. Another respondent articulated a similar concern:

Respondent 2: "*You see the adverts on billboards they are advertising male condoms and so forth. It's…. I would say, on a scale of one to ten, males are given more power about nine out of ten. Females are given four out of ten. It's as if females are... less important as opposed to men when it comes to that moment* [sexual encounters] *because of how society has portrayed it to be*."

The above comment reiterates the idea that promotion and endorsement of the male condom is closely associated with power dynamics; women in the focus group articulated that men are given power in the context of sexual relations through the promotion of the male condom.

Microbicides are presented as empowerment tools for women. In both focus group sessions, all the respondents generally thought that microbicides have the potential to empower women in protecting themselves from HIV infection. Certainly, this is not to say that any prevention tool can substitute for addressing societies patriarchal practices that foster gender-power inequality. With this understanding, there was a strong acknowledgment that microbicides have the potential to give women some degree of control over safe sex practices, which then translates to giving women power as well as autonomy over their sexual health.

Respondent 1: "*I just think that it's relevant because it gives females hope and that is one if the biggest issues for me…So to me it works in the sense that you giving females power which we lack so badly and not just in the South African context but in the African context. Even in our patriarchal society*"

The above respondent echoes that within the South African context, women lack power. The main concern expressed by respondents was the lack of power women have currently, especially with issues concerning HIV prevention. Respondents' conceptualization of "lack of power" ranged from a shortage of prevention methods to the poor accessibility and endorsement of the female condom.

> Respondent 1: "…*you don't have power. The minute I take it without him knowing, it doesn't make it different… you cannot say I have power by doing this thing secretly. At the end of the day you're still saying "no, no, Brian doesn't have to know." You know what I'm saying? You are doing it behind Brian's back. What happens to that power to*…?"

Using microbicides secretly i.e. without your partner knowledge, means that you are not empowered. Participants in focus group A expressed that if women still feel they need to conceal their use of a microbicide to protect them again HIV infection, this implies that they are not empowered. Moreover, the growing knowledge of HIV prevention and gender power relations suggests that the development of biomedical products that propose to give women power without male cooperation, will likely be ineffective because they will not address the underlying issue that exacerbate female vulnerability to HIV infection (Jewkes, 2009). Power dynamics play a significant role in the intensifying HIV and AIDS epidemic; women who lack power within sexual relationships are more vulnerable to HIV infection, these are central factors that cannot be ignored as HIV prevention methods are being developed (Pettifor et al., 2004).

Even though the development of microbicides was a response to power inequality in sexual relationships, as well as gender norms that exacerbated female vulnerability to HIV infection, a growing body of knowledge suggests that men must be involved in HIV prevention methods that set out to empower women (Lanham et al., 2014; Venables and Stadler, 2011; Kelly et al., 2015; Dayton et al., 2014). It is becoming evident that male support in microbicide use by women will promote acceptance, uptake and adherence to these biomedical prevention tools. Findings from this small sample support previous findings, with the strong suggestion that men should be the initiators of microbicides; however this may present challenges in the South African context. In order for microbicides to be relevant HIV prevention technologies within the South African context, there is a need to explore the social

and cultural context in which these products may be rolled out in the future. The involvement of men in the development of microbicides for women is an important area that needs further study, according to the CCA; health related interventions need to be developed in a culturally sensitive manner in order for the health intervention to be aligned with the characteristics of the population (Dutta, 2011). Therefore, there is a fundamental need to explore whether male involvement in microbicide development will be culturally relevant within the South African context.

Gap between knowledge and behavior

The data from the focus groups confirmed the understanding that there is an interesting relationship between individual's knowledge and behavior, even though people are informed about HIV and AIDS , and have a high level of knowledge about HIV transmission, there is still a high level of risky sexual behavior. A respondent from focus group A said:

> Respondent 1: "*For me, it's almost as if there is this gap between what we know, and what we actually do. So even if these gels are coming out, the ring is coming out, how are we… I don't know. How will they actually… are we really going to use them? And you know… at the back of my head I'm have those questions. Cause we're all saying yes this is awesome, but …*"

This response expresses concern regarding the use of microbicides as HIV prevention methods; this respondent articulates the fact that there is a gap between what people know and how people behave. This concern highlights the idea that even when microbicides are available for women to use, women may not use these products. There is an apprehension that the licensing and availability of microbicides may not translate to the effectiveness of these prevention products because of the discrepancy between awareness of prevention methods and the utilization of these prevention measures.

Research supports this controversy: in various contexts, women and men engage in risky sexual behavior in light of knowledge and awareness of HIV and AIDS (James et al., 2004; Abdool Karim, 2005). A study which investigated individual's sexual behavior discovered

that despite the wide acceptance and positive attitudes towards condoms, both males and females avoided use of a condom during sexual encounters (James et al., 2004).

Other comments concerning this point included the following:

> Respondent 2: "*and it just boils down to the individual. You can tell me that 'listen if you jump over there, there is fire' and then I walk away and you go and jump in there I am not responsible because I've told you. I've empowered you, I've given you that knowledge but if you decide not use that knowledge, what can I do?*"

From this respondent's perspective, the choice whether to use an HIV prevention method should be left to the responsibility of the individual; the argument here is that prevention methods should be made available for women, regardless of the fact that some women may not use the prevention measures.

> Respondent 3: "*There can be a thousand ways to prevent but if I choose not to use them then I don't. You know. It's not about how many, how much is available buts it's about me deciding to use it, that type of thing. You know. If you tell me to abstain I'm not going to do that type of thing. But if you tell me to condomise, I don't want to use a condom that type of thing.*"

Like most of the respondents, this student echoes the argument that the availability of an HIV prevention methods does not translate to the utilization of that prevention method. However this respondent brings to the surface an interesting point that the utilization of an HIV prevention method is largely dependent on an individual's choice, not necessarily on awareness of a prevention method. It is for this reason that prior research has suggested that there is a need to develop culturally sensitive programs to introduce new HIV prevention methods; people's choices are shaped and influenced by their socio-cultural context, particularly in the African context (James et al., 2004; Airhihenbuwa and Webster, 2004).

Cultural Issue

Central to this study is the cultural context in which women's attitudes and preferences towards HIV prevention methods are shaped and fostered. Most HIV prevention campaigns and programs have given inadequate recognition to the complex cultural and social factors which directly influence sexual behavior and decisions (Chersich and Rees, 2008; Singhal, 2013; Greene et al., 2010). The Culture-Centered Approach advocates the notion that health development campaigns must not ignore the collective decision making matrices in which individuals are embedded, including the family, community and the broader cultural context (Dutta, 2011). These theoretical pillars are further supported by the findings from this small sample.

African "gender-roles"

When the participants were asked if they thought that the use of microbicides by women would be culturally acceptable in the South African context, responses were more or less the same.

> Facilitator: "*Ok so I would like us to actually speak about this whole culture element. What cultural factors will contribute towards the fact that women are using these products …? Do you think culturally these would be acceptable*?"

> Respondent 1: "*No. Especially in the African community you know? The males are like 'oh so you think you are in control now' they sort of like now...we as women we actually have a say to something they don't like, something they don't want you know? Because they are so comfortable in being in control type of things, so I don't think they will easily accept it…The males are going to be thinking now 'ok women want to have a say' type of thing you know? I don't know yeah...i hope you get what I'm trying to say that it will be highly unaccepted.*"

This respondent is expressing the challenges that may be faced by women, particularly Black African women, when introducing the use of microbicides into their relationships. This respondent is noting the gender-related issues that may arise within the "*African community*" context. Currently HIV prevention in heterosexual relationships largely relies exclusively on

the use of the male condom, this method of prevention is dependent on the male's willingness and ability to use the condom. The use of microbicides in the African context may be opposed and challenged by cultural prescriptions that endorse patriarchal practices where women are expected to play subordinate roles within sexual relationships. In other words, in contexts where men are assumed to be in control of practices in sexual relationships, the notion of having women initiate the use of an HIV prevention method may encounter various contestations.

It is evident that new HIV prevention methods such as microbicides require their own nuanced approach to gender-related issues. Studies investigating male-involvement assert that the support of men in microbicides use by female partners will enhance adherence to microbicide use (Venables and Stadler, 2011). Culture plays a critical role in determining peoples' health preferences and decisions, particularly in the African context where the family and community influence an individual's health choices (Airhihenbuwa and Webster, 2004). There are cultural context whereby the introduction of products that emphasise the women's control of their bodies and women empowerment can be threatening to men (Mantell et al., 2005). Therefore cultural ideologies that support male resistance to the use of microbicides by women need to be taken into consideration while microbicides are still in their developmental phases.

Sex- a "forbidden" topic

One of the key points that surfaced during the discussion on "culture" was the fact that in many African cultural contexts, talking about sex and any sexual interactions is perceived as socially unacceptable. This respondent is expressing their sentiment that within these cultural contexts where talking about sex is unacceptable, there is also a need to ensure protection against sexually transmitted diseases. These issues are areas that need to be explored when developing new HIV prevention methods so that the introduction of these methods may be acceptable for a particular target group i.e. Black African women. In advocating for a culturally-sensitive approach to HIV prevention, Singhal (2013) metaphorically- speaking states that HIV prevention strategies need to shift focus from the tree to the forest. This translates to the notion that HIV prevention strategies need to go beyond focusing on the individual, but rather need to examine the broader socio-cultural context in which individuals are embedded.

Respondent 2: "*In the African culture we are very much still stuck in back in the day, those days where 'we are so afraid to talk about that I am having sex'. I am having sex, be ok with it and...as much as our parents would love for us to start having sex when we married as we did back in the day, it's not happening. But what we are supposed to try to do is preventing more of us getting children and having AIDS and having STD's and all of that*…"

Prior studies suggests that there is a critical need for assessment of microbicide acceptability in order to address issues surrounding cultural norms, and how cultural norms affect sexual practices (Hammett et al., 2000). Attaining this understanding will ensure the effective roll-out and acceptance of microbicides. It would be an error to promote the use of microbicides without studying how these biomedical products can be facilitated and communicated in a culture-sensitive manner.

Convenience of HIV prevention methods

Throughout the two focus group sessions the issue of 'convenience' in HIV prevention methods emerged as an important theme. It became evident that participant's perceptions towards HIV prevention methods were driven by the issue of 'convenience', in other words, they raised questions such as: is the prevention method easy to access, is it easy to apply or insert, is it comfortable, and is there a simple regimen to follow?

Respondent 1: "*The gel most definitely...because...I don't want to say something very crude but I don't think I could stick stuff* [the ring] *up my part...I'd worry about it falling out, it would be uncomfy."*

Respondent 2: "*Yes and it* [ring] *really looks uncomfortable. I'm not even sure if it's sitting right may be I've positioned it not correctly...I can't even see what's going on down there. I just pushed it up and I'm not sure where it went to type of thing."*

When considering the use if the ring, these two participants articulated that they perceive that using the ring would be 'uncomfortable'. This was the first reservation these two participants articulated about the ring as an HIV prevention method. These findings suggest that when an

HIV prevention method is being developed, factors such as comfort and convenience should be considered to ensure that the product appeals to potential users. This is in keeping with findings that emerged earlier in the focus group where discussants expressed that one of the frustrating nuisances in using the female condom was that it looked complicated and uncomfortable.

However, there were respondents who felt that using the ring would be more convenient because of its long-term use.

> Respondent 3: "*I think the ring would be more, I don't want to say convenient but, more like... You don't have time to put on the gel and it's in there for like three weeks*."

This respondent expressed that she would prefer using the ring because she would not have the burden of remembering to use the gel or setting time aside to apply the gel. This perception was not exclusive to one participant: there were others who expressed that using the ring would be more convenient because of the simple regimen it requires. There are recent studies that have analysed long-acting microbicide rings that may simplify use instruction, therefore facilitating adherence (MacQueen et al., 2014).

Summary of findings

The data collected in this research revealed several issues pertaining female students perception, attitudes and acceptance levels towards microbicides as developing HIV prevention methods. Below, is a summary of the findings:

- Most students believe that abstinence from sexual encounters is the **most trusted** methods of HIV prevention, followed by the use of a male condom for every sexual encounter. Interestingly, even though students believe that abstinence is the most effective measure of HIV prevention, this does not necessarily translate to students abstaining from sexual encounters.
- Female students displayed negative attitudes towards the female condom. Data revealed that the female condom is the **least trusted** HIV prevention measure; even

though students strongly stated that the female condom empowers women to protect themselves from HIV infection.

- Most respondents indicated that there are insufficient prevention methods that women can use. Students feel that there is **a need for more HIV prevention methods** specifically for women. There was a persistent suggestion from the respondents that there is a need for "female-controlled" methods of prevention.
- **Acceptance levels** towards microbicides as HIV prevention methods that can be 'controlled' by women were high, with most respondents indicating that they would personally use microbicides.
- **Perceptions and attitudes** towards the dapivirine ring and the tenofovir gel were drivers. The questionnaire exposed that students residing away from home were more likely to prefer using the tenofovir gel, whereas students residing at home were more open to using the dapivirine ring. The focus group sessions revealed that overall; more students were more open to using the dapivirine ring, r than to using the *tenofovir gel.*
- Female students indicated that they would want microbicides to be available in other forms, with most respondents stating that they would want microbicides for HIV prevention to be in the form of **an injection.** Second to this option was a pill, then a cream. This was a strong suggestion that microbicides should be developed in several forms in order to meet a variety of women's needs and desires for an HIV prevention method.
- **Covert use of microbicides** was the most appealing characteristic for respondents.
- **Male involvement** may be necessary when introducing microbicides in the South African context to ensure better acceptance and uptake of the microbicides products, however their involvement should not in any way overshadow the notion of women empowerment.
- **Product characteristics** are critical as they will influence adherence and acceptance of microbicides by potential users.
- Microbicides must be developed in **several forms** in order to appeal to the needs and desires of various women.
- Microbicides must be developed so that they are **culture—sensitive;** cultural factors that can discourage women from using these biomedical prevention tools need to be factored into the product development and design.

Chapter Seven: Conclusions

This study sought to determine female students' perceptions, attitudes and acceptance levels towards microbicides as developing HIV prevention technologies for women. Through a comparative analysis of female students' preferences between the dapivirine ring and the tenofovir gel, this study sought to explore and understand the relationship between product characteristics and women's acceptance of and preferences towards developing HIV prevention methods. The Culture-Centered Approach (CCA) proved to be an appropriate framework to examine the attitudes and acceptance levels of female students towards microbicides; this approach leads to the understanding that in order for microbicides to be relevant and effective for women, these biomedical tools must be culture-sensitive and contextually fitting. Central to the CCA is the notions that the best approaches to HIV prevention are not those that simply put out messages and give tools, but rather those that first create a space for voices of those most affected to be heard.

Questionnaires and focus group sessions were employed to collect data for this study. The focus groups ensured that the students' perceptions and attitudes towards microbicides are deduced from dialogues pertaining HIV prevention methods.

In this chapter, conclusions from this research study are presented. Limited recommendations are also provided. Given that this is a low-scale mixed methods study, extensive recommendations cannot be made in order to avoid overstepping academic boundaries. Several conclusions were drawn from this study. Firstly, it emerged that the female condom is an excellent parallel for examining acceptability of microbicides as both these prevention measures promise to empower women to be able to protect themselves against HIV infection. Secondly, the students who were part of this study believed that microbicides are relevant as there is a need for 'women-controlled' methods of HIV prevention. It was also discovered that male-involvement in microbicide development and introduction may be beneficial in ensuring better acceptance levels.

The findings in this study also suggested that the formulation in which microbicides are developed is important as product characteristic will influence acceptability of the products as well as adherence. It was also discovered that cultural issues may impact the acceptance and uptake of microbicides: the cultural factors that were raised are power and gender related.

The respondents aired concerns that in some African contexts, men will feel intimidated by an HIV prevention method that promises to empower women. These notions led to one of the key findings in this study which is the suggestion that male involvement in microbicide development can foster better acceptance and uptake of these biomedical tools. Findings from this small-scale study reveal that UKZN female students strongly believe that there is a pivotal need for 'female-controlled' methods of HIV prevention, and that microbicides are practical biomedical tools that can empower women.

Preferences between the dapivirine ring and the tenofovir ring varied. Data from the questionnaires revealed that female students were more likely to prefer using the gel, whereas data collected from the focus groups strongly suggested that female students would prefer utilizing the ring for protection. Female students who indicated that they would prefer the ring instead of the gel emphasized that their choice was largely influenced by the easy adherence regime of the ring. The data revealed that the dosing regimen of the gel was a challenge for female students: they were concerned that they would fail to adhere to the product as it required consistent and frequent use. This is an important finding as the effectiveness of the product will depend on whether women can use the products recurrently and correctly.

Lessons we can learn from the female condom

The key findings of this study reveal that the most trusted HIV prevention method by female students is the male condom, and the female condom is the least trusted. The data collected from the questionnaires revealed that even though respondents believed that the female condom empowers women by allowing them to negotiate safe sex practices with their partners, respondents clearly indicated that they do not trust the female condom. This data reflects that fact that prevention measures may be credited to be effective and empowering in theory, but people may not perceive it as trustworthy. Belief that a prevention method is empowering does not necessarily translate to its utilization: a number of factors contribute to the uptake and utilization of a prevention method. This study also established that respondents believed that they are at risk of HIV infection; respondents believe that they are vulnerable to HIV infection.

Several factors emerged as contributing to female student's negative attitudes towards the female condom. These include: poor endorsement of the female condom, limited access to the female condom and characteristics (size) of the female condom. Even though respondents indicate that they thought female condoms were empowering, negative perceptions towards female condoms were noted: respondents echoed their concerns that the female condom is not endorsed as much as the male condom, with little if any media coverage focusing on educating people about the female condom. Moreover, it was raised that female condoms are not as easily accessible as male condoms. Participants in the focus groups persistently displayed negative attitudes towards the female condom.

The dialogues from the focus groups suggested that in order for HIV prevention methods to be trusted, accepted and utilized, there is a need for health communication campaigns to introduce, educate people and promote the use of the prevention method. These findings support prior studies that advocate a positive correlation in the "promotion of a product" and "positive perceptions" towards the product (Mantell et al., 2005). In relation to microbicides that propose to empower women to protect themselves against HIV infection, communication messages must be designed which position the introduction of microbicides in a way that will avoid negative perceptions. Lessons must be drawn from women's perceptions of current HIV prevention methods in order to aid the successful introduction of new HIV prevention methods.

Data also showed that one of the barriers to female condom use is the fact that even though this prevention method is 'female-controlled', female condom use still requires negotiation and consent from a sexual partner. Therefore, the effectiveness of the female condom depends on the willingness of a partner to consent. This discussion lead to the respondents raising the issue that there is a need for female-controlled methods of HIV prevention.

There is a need for 'women-controlled' methods of HIV prevention

Data collected from the questionnaire revealed that 88% of the respondents felt that there is a need for 'women-controlled' methods of prevention; the focus group sessions showed similar findings with respondents stating that there aren't even methods of prevention that women can use. This clear need for prevention methods that women can control leads to the vast

majority of respondents agreeing that microbicides are practical biomedical tools that women can utilize in protecting themselves against HIV infection.

The high level of reported interest in microbicides suggests that these developing biomedical tools are relevant and significant in HIV prevention. The positive attitudes that respondents displayed were accompanied with suggestions that microbicides should be developed in several forms, including injections and pills. Data from both the focus groups and the questionnaire indicated that respondents desired other formulations of microbicides to be developed. The findings from the focus groups suggest that having microbicides available in several formulations may be beneficial in addressing the different needs and preferences that women have. Overall, this small-scale study supports prior empirical evidence from studies on microbicide acceptability, that assert that even in the absence of licensed microbicides women are interested in using microbicides (Mantell et al., 2005; Tanner, 2008).

Product characteristics determine acceptability and attitudes towards microbicides

Acceptability of the study products were found to be closely linked to product characteristics. The data revealed that product characteristic has a great influence on the acceptability and attitudes towards microbicides. The possibility of being able to use an HIV prevention method without the consent and knowledge of one's sexual partner appealed greatly to some respondents. It became abundantly clear that product characteristic would be a driving factor in acceptance and uptake of microbicides. It was suggested in the focus group that several other forms of microbicides should be developed, which would offer different characteristics.

It became evident that different formulations of microbicides would appeal to different women. Data from the focus group and the questionnaires illustrate the fact that the dapivirine ring appealed to some women because of its characteristics, while the tenofovir gel also appealed to other female students. It is not clear what factors inform women's preferences towards different microbicide formulations, but perhaps relationship dynamics are a major factor as some women insisted that they would use a microbicide which could be used covertly. Moreover, it can be deduced that the type of microbicide formulation (pill,

injection, ring, gel etc.), will most likely affect the possibility of using the product without a partner's knowledge.

Culture gender-norms challenge microbicides

The findings from this study highlighted the critical need for more HIV prevention methods that women can control. Respondents felt that women-controlled methods of HIV prevention were particularly important in the South African context, where women sometimes struggle to negotiate safe-sex practices with their male partners. The vast majority of respondents strongly believe that there is a need for more prevention methods that women could use; however several cultural dynamics that could challenge these notions were raised. It became evident that gender norms challenge this need for an HIV prevention method that women can control.

Findings uncovered that cultural issues will play a critical role in the acceptance and attitudes towards microbicide as HIV prevention methods. Certainly there is a social discourse that men have dominant roles within sexual relationship, but this discourse is more intense within African cultures. Respondents raised the challenge of men within the African culture feeling threatened and perceiving the introduction of microbicides as contradicting the male-leader role that is entrenched within most African cultures. It emerged from the data that the gender roles which afford men positions of dominance in sexual relationships will be a challenge in the acceptance of microbicides. The overall impression was that the introduction of microbicides must take into consideration cultural issues that can prove to be a barrier in the acceptance and uptake of these biomedical products.

Male involvement in Wo[Men] empowerment

Despite most respondents expressing positive attitudes towards microbicides as a prevention tool that can be used covertly, it became evident from the focus groups that male involvement in the development and introduction of microbicides may be necessary. It was interesting to discover that there were respondents who strongly believed that the covert use of microbicides could lead to poor adherence and low levels of acceptance within sexual relationships.

Emerging findings from microbicide studies are bringing greater attention to the possibility of involving men in clinical trials, and in this small-scale study some respondents felt that microbicide could be accepted if these biomedical products are introduced in a manner that involves men. These ideas were raised as the vast majority of respondents agreed that women usually place the responsibility of carrying 'protection' on their male partners. This finding proved to be controversial as some respondent were attracted to the use of microbicides because this prevention tool could be used covertly.

What emerges here is the idea that while some women will desire to use microbicide products covertly, others may feel more comfortable disclosing microbicide use to their partners. This study's findings suggest that male involvement in the development of microbicides is a concept worth studying, however this should be done is such a way that it will not remove the fundamental vision of an HIV prevention method that empowers women. More research still needs to be conducted to better understand how microbicides can be introduced in different sexual relationships.

Further considerations and directions for future research

The most recent and significant results from PrEP clinical trials show that a monthly vaginal ring that contains dapivirine reduces HIV-1 infection among African women (Baeten et al., 2016). Findings from this clinical trial highlight the need for further research to be considered, these are emphasized in this study. Several areas of interest emerged from this study which require further research. The involvement of men in the development of microbicides for women is an important area that needs to be studied in order for future microbicides to be rolled out in an effective and relevant manner. Findings from this research study suggest that involving men in the development of microbicides may be necessary when introducing microbicides in the South African context to ensure better acceptance and uptake of microbicides products., However, their involvement should not in any way overshadow the notion of women empowerment.

The second suggestion to consider in microbicide research studies relates to communication, promotion and sharing of information about microbicides. While there are no microbicides that are currently available, preparation for a future microbicide introduction must be underway. Microbicide clinical trials may lead to the licensing and roll-out of a microbicide

in the near future. Therefore there is a need for the foundation of a future microbicide to be laid out, researchers in the social sciences as well as in the biomedical field need to work together to inform and educate people about these biomedical technologies. Most of the respondents who were part of this study indicated that they had not heard about microbicides prior to this study, as a prospective HIV prevention method, this is not ideal. The relevant stakeholders should actively ensure that the public at large is informed about the developments of microbicides through media and academic platforms. Marketing the study products should create an accepting environment for women top use these biomedical technologies.

Thirdly, this study discovered that the covert use of microbicides is a controversial concept that needs further research to understand whether it is ideal to design and develop microbicide products to suit covert use.

Limitations

This study had several limitations: in this section major limitations will be presented. Firstly, the sampling technique employed in the research restricted the findings from being generalizable. The data collected from the questionnaire is not tested for reliability, in terms of portraying a good representation of all female students, it is not an accurate representation. Non-probability sampling limits research findings from being generalisable to the whole population. Therefore the perceptions towards microbicides and HIV prevention methods established in this research cannot be taken as a reflection of the entire population of KZN. Secondly, the respondents who were part of this research had not been exposed to the products under investigation. This serves as a limitation because women's perceptions and attitudes may be largely influenced by the fact that they have not used these products and also that these products are still under clinical trials. Perceptions towards products that are still under clinical trials will differ from perceptions towards products that are already licensed and available. Furthermore, most respondents expressed that they had never heard or known about microbicides prior to this study; this could impact on their perceptions, attitudes and acceptance levels.

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Appendix A- Focus group schedule

Focus group guide

Research title: A comparative study of student's attitudes, preferences and acceptance levels towards microbicide products; The Tenofovir gel and The Ring at UKZN

SECTION A – 15 minutes

Introduction (by facilitator)

1. Warm welcome to everyone and introduction of the facilitator to all the participants.
2. Facilitator asks each all the participants to briefly introduce themselves and a mention of one of their hobbies (ice breaker).
3. Purpose of the focus group stated by the facilitator

The purpose of this focus group discussion is to explore women's perceptions and possible acceptance levels of microbicides, which are new biomedical HIV prevention technologies. Specifically, this focus group sets out to investigate which of the two microbicides; *Tenofovir gel* and *Dapivirine ring* do women prefer and what informs these preferences. The discussions from this focus group will be of great benefit in understanding women's attitudes towards HIV prevention methods. We are interested in what women want and need to safely and effectively protect themselves from contracting HIV. Everything discussed here will be treated as confidential.

4. Explaining of ground rules.

It is encouraged that everyone be part of the discussions in a respectable manner; anyone can contribute after the previous speaker is done talking. Freedom of expression is acknowledged with the understanding that this may be exercised in a respectable manner; no one may make reference to individuals who are not present in the discussion. Everyone should express their own opinion as there are no wrong or right answers. The focus group will have duration of 1 to 2 hours with a break in-between for a light lunch.

5. Read out consent form, and then participants may sign their consent forms.

SECTION B- 15 minutes

Recognition of the problem and need for microbicides

1. The problem: brief explanation of the fact that women are the most vulnerable to HIV infection.
2. An introduction of microbicides and specifically the *Tenofovir gel* and the *Dapivirine ring*
   a) Application of the gel BAT-24 (show images)
   b) Application of the ring (show images)
3. Facilitator shows the ring and the gel, passing them around so that participants may see and feel the products (participants may not open the products)

SECTION C- 15 minutes

Discussion on HIV prevention

1. What do you think has caused women to be more vulnerable to HIV? Do you believe that they are more vulnerable to HIV infection than males?
2. Do you think women are in control of protecting themselves from sexually transmitted diseases including HIV?
   a) Do you think men are in control of safe sex practices?
   b) Do you think women have adequate means of protecting themselves against HIV infection?
3. As a female student in Kwa-Zulu Natal, do you think you are at risk of HIV infection?
4. Currently female condoms are the only female-controlled method of HIV prevention available to women. Do you think the female condom is an adequate means of protection for women?
   a) Why do you think many women do not use female condoms for protection?
   b) What are your own perceptions of the female condom?

SECTION D- 30 minutes

Discussion on microbicides

1. As a female student in Kwa-Zulu Natal what do you know about microbicides as a HIV prevention method?

2. The *Tenofovir gel* and the *Dapivirine ring* are different in form and application, which from the two would you prefer to use? Why?
    a) What kind of women would use the ring? What kind of relationship would she be in?
    b) What kind of women would use the gel? What kind of relationship would she be in?
3. Do you think the BAT-24 strategy for application of the gel is simple to adhere to? What are the successes or challenges/setbacks of this dozing strategy?
4. What are your perceptions of the application of the ring? Do you think women will adhere to this method of application?
5. In your own opinion what are cultural factors that will affect how people respond to microbicides?
    a) Between the ring and the gel, which microbicide do you think will be more culturally acceptable?
6. If you had to use a microbicide, what would be the ideal microbicide?
    a) What form would it come in? Cream, pill, injection etc…
    c) In terms of traits smell and feel etc…
    d) In terms of when it is applied?
    e) Should it also have contraceptive properties?

Conclusion: Thank you for your participation is the discussion, if you have any questions please ask me and I will answer to the best of my ability.

Appendix B- Focus group consent form

Consent form

Thank you for taking part in this research study. Your participation will be of great value towards the research study entitled "*A comparative study of student's attitudes, preferences and acceptance levels towards microbicide products; The Tenofovir gel and The Ring at UKZN*". This study is conducted by Phiwe Nota (Student number: 2010510013) towards her M.sc degree.

Please note that your participation in this focus group is voluntary, should you not want to be part of the discussion you may withdraw from the focus group at any point in time. Your withdrawal from the focus group will not disadvantage you in any way.

With your permission, this focus group session will be recorded using a sound recorder during the focus group. This will be transcribed; however your name will not be used in the written research report.

If you would like to participate in focus group please provide your full name and signature.

I, _____ have agreed to participate in the workshop and agree that the discussion may be recorded.

Date: _____

Signature: _____

Should you have any questions about this study you may contact the student conducting this study:

Phiwe Nota

Centre Communication, Media and Society
University of KwaZulu-Natal,
Howard College Campus

Email address: makaulaphiwe@yahoo.com
Cell: 0735304189

Should you have further questions please contact the supervisor for this study:

Dr Eliza Govender
Email: govendere1@ukzn.ac.za
Tell: 031 260 1044

Appendix C- Questionnaire consent form

Informed consent

Researcher	Phiwe Nota	0735304189	makaulaphiwe@yahoo.com
Department	Centre for Culture and Media in Society (CCMS)	+27-31-2602505	http://ccms.ukzn.ac.za/
Institution	University of KwaZulu-Natal (UKZN) Howard College Campus Masizi Kunene Avenue Durban, 4000	Flat 508 The Gables 174 Victoria Embankment Durban 4001	www.ukzn.ac.za
Supervisor	Dr Eliza Govender	+27-31-2601813	Govendere1@ukzn.ac.za
Chair, UKZN Human Sciences Research Committee	Dr Shenuka Singh	+27-31-2608591	singshen@ukzn.ac.za
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.			

Dear Participant

Thank you for taking part in this research study. Your input will add significant value in to the research project titled "A comparative study of women's attitudes, preferences and acceptance levels towards microbicide products; The *Tenofovir gel* and *The Ring*".

This study aims to explore the various attitudes female students at University of KwaZulu-Natal, Howard College have towards microbicide products for HIV prevention. This research is conducted by Phiwe Nota (Student No: 210510013) towards her Master of Social Science degree.

Please be advised that that you may choose not to participate in this research study and would you wish to withdraw at any stage, you have the full right to do so and your action will not be of any disadvantage to you in any way.

Your participation in this research will be through filling out a questionnaire or taking part in a focus group discussion; these will be arranged to ensure minimal disruption to your schedule. The information obtained will be treated as confidential; pseudonyms will be used in identifying respondents or participants when necessary. This will be safely stored at the University of KwaZulu-Natal, Howard College Campus.

Signed consent

• I understand that the purpose of this interview is solely for academic purpose. The findings will be published as a thesis, and may be published in academic journals.	**Yes** ☐ **No** ☐
• I understand I will remain anonymous. (Please choose whether or not you would like to remain anonymous.)	**Yes** ☐ **No** ☐
• I understand my name will be quoted. (Please choose whether or not you would prefer to have your remarks attributed to yourself in the final research documents.)	**Yes** ☐ **No** ☐
• I understand that I will not be paid for participating but a souvenir will be given.	**Yes** ☐ **No** ☐
• I understand that I reserve the right to discontinue and withdraw my participation any time.	**Yes** ☐ **No** ☐
• I consent to be frank to give the information.	**Yes** ☐ **No** ☐
• I understand I will not be coerced into commenting on issues against my will, and that I may decline to answer specific questions.	**Yes** ☐ **No** ☐
• I understand I reserve the right to schedule the *time* and *location* of the interview.	**Yes** ☐ **No** ☐
• I consent to have this interview recorded.	**Yes** ☐ **No** ☐

*** By signing this form, I consent that I have duly read and understood its content.**

_____	_____	_____
Name of Participant	**Signature**	**Date**
_____	_____	_____
Name of Researcher	**Signature**	**Date**

Appendix D- Questionnaire

Dear respondent,

This questionnaire is designed to gather authentic information on student's perceptions of microbicide products: tenofovir gel and the dapivirine ring. Please only tick one relevant answer.

Thanks for your participation.

Introduction:

The term microbicide refers to substances that are under clinical trials that could be used by women to reduce the risk of HIV infection through sexual intercourse (AVAC, 2013). There are no microbicides that have been licenced and available yet, but biomedical researchers hope that in the near future these products may become available as an HIV prevention method for women.

Currently, the only microbicide products that show significant HIV risk reduction are; The tenofovir gel and the dapirivine ring (AVAC, 2013). The tenofovir gel is a varginal gel with 1 % tenofovir, which is an ARV drug (Centre for the AIDS Programme of Research in South Africa- CAPRISA, 2010). This gel works by preventing the HIV virus from reproducing itself in susceptible cells (Durden, 2011). This varginal gel is applied before and after sexual intercourse by the female. In past studies, the tenofovir gel has shown a 39% lower risk of being infected with HIV, and a 51% lower risk of being infected by genital herpes among women who used this product (CAPRISA, 2010). As mentioned above, this product has not been licenced but is still going through trials to verify the positive results of past studies.

The dapivirine ring, is a vaginal ring made from silicone, it contains an ARV called dapivirine (AVAC, 2013). This vaginal ring fits into the vagina and slowly secretes the ARV drug throughout a four-week period which protects the susceptible cells from HIV infection (AVAC, 2013). This microbicide product is still going through trials to verify its safety and effectiveness.

Please refer to the attachment at the end of the questionnaire for a more detailed description of the tenofovir gel and the dapivirine ring.

PART A

1. Demographic data

1.1 Age	**17-20**	**21-29**	**30-39**	**40-49**

1.2 What is your race group?	**Black**	**White**	**Indian**	**Coloured**	**other**

1.3 Marital status		**Married (Living with husband)**
		Married (Not living with husband)
		Not Married (living with boyfriend)
		Not married (not living with boyfriend
		Separated/ divorced
		Widow
		Single

1.4 What category of student are you?		**Full-time student**
		Part time student
		other

1.5 Which year of study are you currently in?		**First year**
		Second year
		Third year
		Post graduate

1.6 Where do you reside while on session		**On-Campus residence**
		Off-campus residence
		Rental house/room off campus
		Off- campus with parents
		Off campus with Friends

2. Level of Knowledge on HIV/AIDS

2.1 In the course of this year, which of the following sources have you found to be personally useful in obtaining information on HIV/AIDS?		**Campus HIV/AIDS support Unit**
		Student organizations
		Religious groups on campus
		Friends
		Other

2.2 Are the following questions true or false?			
HIV causes AIDS.	**True**	**False**	**Don't know**
You can reduce chances of HIV transmission by using a condom.	**True**	**False**	**Don't know**
You do not have to use a condom for every sexual intercourse encounter in order to protect yourself.	**True**	**False**	**Don't know**
HIV can be spread through the air.	**True**	**False**	**Don't know**
Traditional healers can cure HIV.	**True**	**False**	**Don't**

			know
You can reduce chances of HIV infection by having fewer sexual partners.	**True**	**False**	**Don't know**
You can reduce chances of HIV infection by being faithful to your partner.	**True**	**False**	**Don't know**
You can become infected with HIV by touching someone who is infected.	**True**	**False**	**Don't know**
A person who is raped can receive drugs from the clinic to reduce the chances of HIV infection.	**True**	**False**	**Don't know**
Sexually transmitted diseases can increase the chances of HIV infection.	**True**	**False**	**Don't know**
Women are more vulnerable to HIV infection then men.	**True**	**False**	**Don't know**
A woman cannot get HIV if she has sex during her period.	**True**	**False**	**Don't know**
Female condoms can help decrease a woman's chances of getting HIV.	**True**	**False**	**Don't know**
A person can get HIV from oral sex.	**True**	**False**	**Don't know**

3. Knowledge, attitudes and preferences of HIV prevention methods

3.1 Which of the following HIV prevention methods do you trust most		**Male condom**
		Female condom
		Ensuring your partner has had Medical Male Circumcision (MMC) and using a male condom
		Only ensuring you partner has had Medical Male Circumcision (MMC)
		Abstinence
		None

3.2 Do you think the HIV prevention methods that are available are adequate?		**Yes**
		No

3.3 Do you know about the female condom?		**Yes**
		No

3.4 If yes, specify how did you get to know about the female condom?		**Friends**
		Clinic
		Billboard
		TV
		Leaflets and information booklets
		Articles in magazines or newspapers

3.5 Female condoms empower women because they place women in positions where they can negotiate safer sex.		**Strongly agree**
		Agree
		Disagree
		Strongly disagree

3.6 Men are in control of safe sex practices		**Strongly agree**
		Agree
		Disagree
		Strongly disagree

3.7 Women are in control of safe sex practices		**Strongly agree**
		Agree
		Disagree
		Strongly disagree

3.8 There is a need for more women controlled methods for HIV prevention		**Strongly agree**
		Agree
		Disagree
		Strongly disagree

4. Microbicides as a new HIV prevention method

4.1 Do you know what Antiretroviral (ARV) drugs are?		**Yes**
		No

4.2 Do you know what ARV drugs are used for?		**Yes**
		No

4.3 How long should people on antiretroviral drugs stay on treatment?		**For the rest of their lives**
		As long as they want
		Until they feel better
		Don't know
		Other

4.4 Have you heard about microbicides prior to this questionnaire?		**Yes**
		No

4.5 If yes, where did you hear/or read about microbicides as a possible HIV prevention method?		**TV**
		News papers
		Internet
		Radio
		Personally from an individual
		None of the above

4.6 Would you use an HIV prevention product that contains an active ARV drug? Why?

4.7 From that which you have read and which the researcher has explained to you about the *Tenofovir gel* and the *Dapivirine ring*, which of these two products would you consider using as an HIV prevention method?

4.8 The *Tenofovir gel* and the *Dapivirine ring* are different in application and appearances, which of these two products do you think would be more convenient to use?

Dapivirine ring		***Tenofovir gel***	

4.9 If microbicide products were to be made available in other forms, which of the following would you prefer?

	Injection
	Pill
	Cream
	None

Dapivirine Ring

Insertion of Ring

1. Wash your hands with soap and dry them on a clean cloth.

2. Get in the position that is most comfortable for you to insert the ring.

3. Hold and press the sides of the ring together, you may find it easier to insert the ring if you twist it into the shape of the number 8.

4. Use your other hand to hold open the folds of skin around your vagina.

5. Place the tip of the ring in the vaginal opening and then use your finger to push the folded ring gently into your vagina.

6. Push it up towards your lower back as far as you can, If the ring feels uncomfortable, it is probably not inserted far enough into your vagina. Use your finger to push the ring up as far as you can into your vagina.

7. The ring should now be in your upper vagina. Wash your hands when you are done.

Questions and answers:

What does the ring feel like when it is inserted?

Although some women are aware of the ring in the vagina, most women do not feel it once it's in place.

Can the ring get lost inside me?

No. The ring cannot be pushed too far up or get lost inside the body.

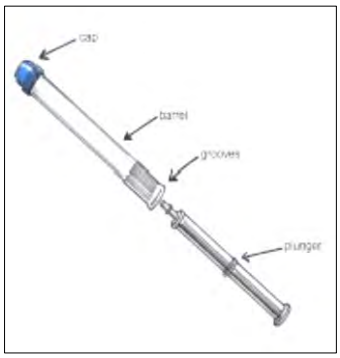
Will the ring fall out?

This is not common, but may happen. If women are worried that the ring has slipped out, they can always use their finger to check that it is still inserted. If the ring falls out, it should be rinsed in clean water and may be reinserted.

Will women or their partners feel the ring during sex?

Some women and their partners may feel the ring in the vagina during sex. While women or their partners may be able to feel it, it is safe to leave it inserted during sex. (All the information that has been provided was taken from the MTN 020 study and can be accessed on the following website: http://www.mtnstopshiv.org/studies)

Tenofovir gel



Inserting the gel

1. Remove the applicator from its wrapper.
2. Put the plunger into the barrel of the applicator by placing the small end of the plunger into the open end of the barrel.
3. Pull off the cap from the applicator.
4. Use your other hand to fold back the skin that covers the opening of your vagina.
5. Place the rounded tip of the applicator to your vaginal opening. Gently push the applicator into your vagina.
6. Using your forefinger, push the plunger right into the barrel. This will make sure that all the study gel is pushed out into your vagina.
7. Carefully remove the applicator from the vagina. Only the gel is to remain in your vagina.

Questions and answers:

When would be the best time to use the gel and how many times in a day can you use it?

Use the gel when you know you will have sex. You need to put the first dose of the gel anytime within **12 hours before** sex. The second dose of the gel you need to apply anytime within **12 hours after** sex. You cannot insert the gel more than twice within a 24hour period (this method of application is referred to as the BAT24 strategy).

Can the gel be used by women who are pregnant?

So far research has not been done on the effects that the gel may have on women who are pregnant and therefore this product is not to be used by pregnant women.

Can the gel be used in conjunction with a condom?

Yes, it is strongly advised that you use a condom correctly for every sexual intercourse even when using the gel.