



# **Fertility and Conception options for HIV-serodiscordant Couples In Sub Saharan Africa**

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<p>Abstract:</p> <p>The purpose of this study was to explore the safer conception methods available for HIV-serodiscordant couples in Sub Saharan Africa and the role of health care systems through nurses concerning informing and advising the couples on the methods. The research questions were: 1) What are the safer conception methods available for HIV-serodiscordant couples in Sub Saharan Africa? 2) What is the nurse's role in helping the couples achieve conception while reducing transmission risk of HIV to the uninfected partner? A literature review was done for the study in search for the answers to the research questions. The search for articles was done in EBSCO, CINAHL, PubMed, SCIENCE Direct databases and in google scholar. The search phrases used are: HIV-serodiscordant couples AND conception, HIV-serodiscordant couples AND conception AND care. The conceptual framework for understanding HIV risk behavior in the context of supporting goals among HIV- serodiscordant couples by Crankshaw et al (2012) was used to guide this study. Content analysis of the chosen 10 articles was done using Graneheim &amp; Lundmans 2004 approach. The findings show that there are low cost safer conception methods that can be used along with interventions thereby helping the couples conceive and lowering the risk of transmission in Sub Saharan Africa. However, some methods are not feasible due to the resource constraints experienced in this region. Information on the available methods and how to use them is lacking leaving the couples at risk due to lack of knowledge. The nurses' role in informing and educating the couples on the issue was cited as important as information would motivate the couples to use the methods. Structural, cultural and social contexts where individuals and couples are placed were found to influence effectiveness and use of the safer conception strategies.</p>	
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## **Acronyms**

**AIDS** -Acquired Immunodeficiency Syndrome

**ART** -Antiretroviral therapy

**ARVs** -Antiretrovirals

**CD4**- Cells-White blood cells also known as T-cells which protect the body from infections

**HIV**- Human Immunodeficiency virus

**HIV-serodiscordancy** - Couples with one person HIV positive and one who is HIV negative

**ICSI** – Intracytoplasmic sperm injection

**IUI**- Intrauterine insemination

**IVF** – In vitro fertilization

**STIs**- Sexually transmitted diseases

**Viral Load** -The measure of HIV virus in an individual's body

**WHO** - World Health Organization

# 1 INTRODUCTION

The human immunodeficiency virus/aids pandemic has affected people all over the world irrespective of race, culture and religion. According to the world health organization (2015) there are 36.7 million people living with the virus. The report continues to explain that the effects of the disease has been felt world over with Sub Saharan Africa being the worst affected by the epidemic. Tanser et al (2013) noted that antiretroviral therapy (ART) has enabled individuals living with HIV to live healthier lives even with the virus. With the large population of those infected being in their reproductive years, Mantel et al (2009) argued for the right of men and women affected by HIV to choose parenthood. The authors noted that people living with the virus also have desires to conceive and raise families like their counterparts who are not affected by the virus. Since conception and reproduction are a major human desire, and given that according to WHO (2009) the right to conception is a basic human right with every person being able to enjoy it irrespective of their HIV status if they wish to, this study therefore is aimed at exploring the measures that have been put in place to help HIV-serodiscordant couples to have children using safer conception methods in Sub Saharan Africa. HIV-serodiscordance is described as an ongoing relationship where one partner is infected with HIV virus and the other one is not.

This thesis is based on the knowledge that HIV-serodiscordant couples desire to have children as parenthood is personally, culturally and historically rooted (Pintye et al, 2015). However even though according to Saleem et al (2017) safer conception methods for HIV-serodiscordant couples do exist, the authors have argued that most affected people do not know of the safer conception methods and or how to effectively use them to have good outcomes. This leads to fear of attempting to conceive due to risk of infecting the other partner or in most cases engaging in risky behaviour to satisfy the couple's reproduction desires. The study looks at the methods available for HIV -serodiscordant couples in Sub Saharan Africa. Information concerning HIV-serodiscordancy in Finland was not available through Arcada's database as well as in google scholar which lead to emphasis being laid on Sub Saharan Africa and also due to the fact that the largest number of people affected by HIV live in Africa. Goggin et al (2014) noted that nurses usually encounter ethical dilemmas when it comes to HIV-serodiscordant couples and conception.

According to the authors this comes from the initial goal of preventing transmission to the uninfected partner or to the desired child which now due to the development of effective ART and other interventions is also possible even during conception. The nurse's role in informing and educating the patients and their partners is shown by the authors to go hand in hand with the success of the conception plans and prevention of risky behaviour.

In the introduction chapter the justification for the thesis is briefly presented. The background chapter looks at some misconceptions that have been shown by other authors and problems that arise with serodiscordancy. In the theoretical framework chapter, the conceptual framework that has been adopted for this study is discussed briefly. The methodology chapter looks at the research technique that has been used by the researcher. In the findings chapter the outcome of the data analysis is presented and in the discussion these findings are expounded and discussed in detail. The final chapter which is the conclusion and recommendations chapter looks at the conclusion drawn from the study looking also at the limitations of the study and recommending on areas where improvements should be made so that the fertility desires of this population are met while also reducing transmission risk of HIV to the uninfected partner.

## **2 BACKGROUND**

The HIV virus has evolved over the years but the common modes of transmission and the risk factors that predispose individuals to the virus have not changed. HIV-serodiscordancy is when partners in a stable relationship are not concordant in their sero-status.

### **2.1 Epidemiology of HIV**

Hall, Song & Rhodes (2008) noted that epidemiology of the human immunodeficiency virus infectivity has altered greatly from the start of 1980s where it started as an outbreak mainly among in youthful gay men in the United States and among sexually active heterosexuals in some countries of Africa. Currently this epidemic has had significant demographic multiplicity affecting people all over the world. Since HIV was discovered almost three decades ago, HIV/AIDS has infected at least 60 million people and has been the leading cause of deaths in some parts of the world (UNAIDS, 2016). According to UNAIDS (2015), developed countries for example Finland continue to experience minimal new infections as there was a recorded number of zero new cases of HIV in that year and has been one of the countries with the least number of infections globally. However, developing countries have been worst affected by the HIV epidemic with the young adults in Sub Saharan Africa experiencing the highest rates of prevalence in comparison to the rest of the world. There were 1.8 million new infections in Sub Saharan Africa in the same year (UNAIDS 2016). Though research and development of antiretroviral therapy has seen the reduction of the HIV/AIDS related deaths, access to the treatments is not universal and the prospects of a cure and effective vaccination are not certain (Barouch, 2008).

### **2.2 Transmission of HIV**

Transmission of HIV has mostly been through three modes that is sexual, parenteral and mother to child. According to Merson et al (2008), sexual transmission has been the most common mode of HIV. The reason given by the authors is that most people do not know their status or the status of their partner when engaging in sexual relationships therefore the risk for infection is high. The authors noted that understanding and changing sexual



behavioural patterns in the context of prevalence of HIV is very important. Interventions that have been put forward have been to advocate for behavioural changes (partner reduction) and promotion of condom use. Couples' testing has been argued for before start of long term relationships or disclosure of HIV status to the partner (Merson et al, 2008).

## **2.3 Risk factors**

The main risk factors in the transmission of HIV are gender: Chances of a person becoming infected with HIV during one sexual act varies greatly and is dependent on many factors. According to Boily et al (2009) the male to female transmission risk is 2-3 times higher in comparison to female to male. The authors state that a woman can get infected from one encounter with an infected partner more easily than a man from a woman. Receptive anal sex carries more risk than receptive vaginal intercourse which implies the easy spread of HIV amongst men who have sex with men.

Viral Load: Sexual transmission of HIV is highly dependent on the infectiousness of the infected partner. Attia et al (2009) argued that high viral load in an infected person who is not on ART or using low therapy of the medication has greater possibility of transmitting the disease. The authors noted that effective ART reduces the infectiousness of a person as well as lowering the mortality rates of those infected with HIV and AIDS.

Sexually transmitted diseases: According to Kalichman, Pellowski & Turner (2011), presence of sexually transmitted diseases enhances transmission of HIV sexually and therefore control of these diseases has been a component in the reduction of HIV transmission. The authors continue to explain that presence of ulcerative ulcers which are common with STIs gives the virus easy and fast access into the blood stream after sexual intercourse.

Parenteral transmission: Bar et al (2010) noted that this is commonly due to sharing of needles by drug users. It can also be as a result of blood transfusion using infected blood. This has been addressed currently by screening of donor blood and avoidance of unnecessary transfusions.

Mother to child transmission: This involves transmission of HIV from mother to child during pregnancy, labor, delivery and also through breastfeeding. According to WHO

(2016) these transmission rates range from 15-45% if no interventions are given for protecting the child. The report continued to explain that the interventions involve ART therapy for the mother and a short course of ATRs for the baby after birth. An estimated 5.1 million children have been affected by HIV globally since the disease was first discovered (WHO 2016).

## **2.4 HIV-serodiscordant couples**

Merson et al (2008) noted that since the onset of the HIV pandemic in Africa, prevention crusades and approaches have been geared towards mostly deterring risky sexual behaviours mainly involving sexual workers and people having occasional partners. Yet Dunkle et al (2008) in their study pointed out that a large portion of HIV infections occur in stable relationships due to prior infection of one of the partners or due to infidelity during the relationship. The authors noted that it is more difficult in stable relationships to adopt preventive behaviours with a regular partner than with an occasional partner. According to Were et al (2008), in Sub Saharan Africa majority of HIV transmission takes place where partners are discordant and have no knowledge of their or their partner's sero-status. HIV-negative persons in committed discordant relationships are more likely (2 times) to be infected with the virus than persons in concordant HIV negative relationships. The fractions of couples in HIV-serodiscordant relationships vary from 5-31% depending on the country. As the authors observed in their study, HIV-serodiscordance is a phenomenon normally poorly understood by the people and even by some HIV counsellors and nurses. De Walque (2007) noted that HIV-serodiscordant couples are being viewed as important foundation of respondents of HIV vaccine and prevention experiments.

Misconceptions concerning discordance are extensive among HIV discordant couples in Africa. This is because there has been no concrete reason given as the cause of discordancy for couples who have been having unprotected sex and one partner is not infected with the disease (Chemaitelly et al, 2012). According to Chemaitelly et al (2013), some of the speculations that people have on HIV-serodiscordancy include that one's probability of getting infected is based on their luck in life and that this could end abruptly then they become infected. In some communities where religion is regarded highly HIV is viewed as punishment from God for being promiscuous. Some individuals believe that

the virus is hiding in the blood and will “come out” at some point and they would test positive just like their partners. Other thoughts that were expressed in their study include that the HIV- negative partner’s immune system has some unique traits different from the positive individual that they believed in Gods protection or the belief that transmission is caused by “rough sexual intercourse”. In these instances, “gentle sex” is said to be one way to protect HIV-negative partners from getting infected. These misconceptions lead to further risky behaviour. The writers further pointed out that in Kenya and Tanzania for example the percentage of HIV-serodiscordancy was almost equal to concordance. Their study also revealed that in the couples who were discordant it was mostly the man who was the infected partner. It has been shown that HIV-serodiscordancy where the woman is the infected partner is between 30-40% in most countries in Africa (Gitonga, Balindawa & Ndege, 2012).

## **2.5 Fertility and conception for HIV-serodiscordant couples**

According to Chadwick et al (2011), fertility and reproductive knowledge concerning HIV-serodiscordant couples are important matters in order for optimal general healthcare delivery services to be realised for this target group. In this case, there is need for the development and testing of safer conception strategies as many HIV-serodiscordant couples have unprotected sex in endeavouring to conceive. The authors further reiterated that there has been a shift in recent years in the international reproductive guidelines for people living with HIV and their partners to avoid conception and parenting to recognizing this as realistic goal for them. Although no conception methods have been proven to be 100% risk free of transmission except when there is possibility to use screened sperm from HIV-seronegative donor (when the male is the infected partner) or vaginal insemination (when the woman is the infected partner), there are several methods for conception in which the risk is significantly reduced with the HIV-infected partner being on antiretroviral therapy and other interventions being in place.

Individual and couple level knowledge of the safer conception strategies for HIV-serodiscordant couples greatly affects sexual behaviours of the couples as they endeavour to fulfil fertility desires. In this context Saleem et al (2017) highlighted the important role that nurses taking care of this population have in informing and educating the couples of the available safer conception methods and how to use them effectively. There are

challenges that accompany this as according to Brubaker et al (2009), the majority of individuals who attend HIV care and services rarely discuss their fertility intentions with their nurses. The authors further noted that when these discussions take place the nurse's tone sometimes becomes judgmental often discouraging individuals from child bearing regardless of their desires with the nurses focusing mostly on prevention of transmission through condom use. Due to misconceptions about HIV-serodiscordancy and the ethical issues that come with it mainly risk of transmission to the uninfected partner and or to the desired child if conception is to be advocated for, nurses have seemed to keep off from offering adequate information to HIV-serodiscordant couples wishing to conceive (Matthews et al, 2016).

### 3 THEORETICAL FRAMEWORK

In Sub Saharan Africa as with the rest of the world, individuals and couples choose parenthood for personal, cultural and social reasons. According to Schwartz et al (2012), many HIV-serodiscordant couples desire and have children inspite of the risk of HIV transmission. There is a very high risk of seroconversion for the uninfected partner when couples endeavour to fulfil their fertility desires without knowledge and usage of the available safer conception methods. The authors pointed out that this lack of information and access to the available methods leads to new infections contradicting the prevention strategies that have been the basis of fighting the spread of HIV. The World Health Organisation in the sexual and reproductive health and HIV/AIDS (2011) article showed that integrating reproduction health matters to the routine health services for people living with HIV is a priority in a bid to cub new infections. With this understanding, the conceptual framework for understanding HIV risk behaviour in the context of supporting fertility goals among HIV-serodiscordant couples by Crankshaw et al has been chosen to guide this study. The framework adapts the Information-Motivation-Behavioral (IMB) skill model of HIV preventative behaviour to address the structural, individual and couple level factors influencing safer conception attitudes and behaviour (Crankshaw et al, 2012).

The IMB model introduced by Fisher and Fisher (1992) noted that information, motivation and behavioural knowhow are the basic components of behaviour change therefore achieving the desired outcomes for patients living with chronic diseases. The nurse's role in this case providing information and educating the couples on the safer conception methods is a pivotal aspect in achieving the desired outcomes. The conceptual framework shows that a combination of understanding and using behavioural and pharmacological strategies will address fertility desires and help reduce HIV transmission risk for HIV-serodiscordant couples while considering the resource constraints experienced in Sub Saharan Africa. A simplified version of the conceptual framework is presented in the figure below with the whole framework being shown in the appendices.

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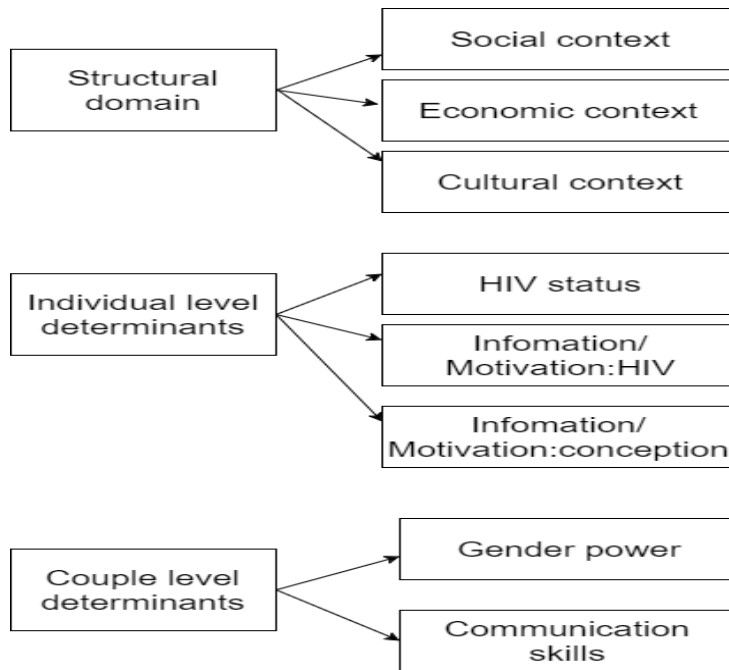


Figure 1. A simplified version of the conceptual framework by Crankshaw et al (2012).

### 3.1 The structural domain

Crankshaw et al (2012) described the structural domain of the conceptual framework as all the aspects covering the social, political, economic and cultural context in which individuals are situated. The health systems, laws and policies made by governments are also viewed as key elements in the structural content. Okeoma et al (2015) noted that health care system through nurses can influence conception related transmission risk by making information available on the safer conception methods that a couple can use when trying to conceive. Nurses attitudes towards HIV-serodiscordant couples that express desire to conceive should be willingness to guide the couples to fulfil their parenting desires while lowering the risk of transmission to the uninfected partner. Bekker et al (2011) underscored the need for a guideline for nurses to use when dealing with HIV-serodiscordant couples which will help ease the delivery of preconception counselling while at the same time ensuring quality care being offered. The authors noted that lack of guidelines leave nurses without clear direction on how to initiate discussions on fertility with the patients in their routine check-ups. These discussions should be done with both male and female patients with further recommendation for couples based counselling on fertility matters. Implementation and practice of the guidelines would also be hurdle that would have to be overcome. Laws and policies may influence in that the government should make antiretroviral therapy available to the infected partner and make the safer

methods for conception for the couples available by implementing cost efficient strategies.

Sovran (2013) explained that poverty in Sub Saharan Africa is a major issue when it comes to prevention of HIV transmission. Poverty is linked to lack of education and in this case affecting the lack of individual knowledge on HIV-serodiscordancy and prevention of transmission to the uninfected partner. Cultural and behavioural norms which contribute to HIV risk behaviour are looked at in this domain. Women are expected by the society to stay with their husbands as in most cases men are the breadwinners of the family. Sovran continues to explain that African culture and particularly women are believed to tolerate polygamous relationships and extramarital affairs from their partners and the cultural expectation that a man is free to be polygamous as long as he can provide for his family also falls into this category. In essence according to the authors, poverty, cultural and societal norms are closely knit when it comes to matters related to HIV. The different gender ideologies which people have in Sub-Saharan Africa surrounding manhood and womanhood in which women do not have autonomy in relationships is included in this domain.

### **3.2 Individual level determinants**

According to Mathews et al (2011), the individual level determinants are considered for both partners. The overall health, HIV status and the desire or intention of both the partners towards having a child influences their reproductive and HIV risk behaviour. A person living with HIV who's on ART will have an improvement in health and thereby may want to satisfy fertility desires. Information and motivation about HIV and conception also form an important part of individual factors affecting risk behaviour during conception. According to the authors the individual level information about HIV and conception is very important as the concept of discordance is not well understood by many people posing the risk of transmission. Individual motivation which includes a person's beliefs and attitudes towards the behaviour in this case referring to the safer conception methods will affect how the individual executes the behaviour change necessary to have the desired outcome. Mittal et al (2012) noted that the desire for a baby can influence a person's motivation to live without risking transmission to their partner or to themselves.

### **3.3 Couples based context**

According to Mittal et al (2012), couple level elements are drawn out in the context of the dynamics in which the relationship occurs. In Sub Saharan Africa gender power differences and communication abilities in most cases have a commanding impact on HIV transmission risk behaviours. In their study Kashesya et al (2010) showed that men have a lot of influence on conception matters. This is due to economic power that men have in relationships thereby showing dominance in fertility making decisions. The authors stipulate that the value of children to both partners with the men viewing children as a show of wealth and women view children as a bond to hold the marriage together comes up in this context. Children for most couples are seen to add value to a marriage as well as satisfying the social demands on the legitimacy of the marriage. Mindry et al (2015) showed that although HIV-serodiscordant couples want to have children, conception sometimes occurs without planning therefore showing the need for early discussions with the couples on fertility and safer conception methods available. In cases of gender violence, a combination of strategies are required to reduce a woman's risk of HIV infection (Mittal et al, 2012).

### **3.4 Summary of the conceptual framework**

This conceptual framework deals with the different factors that affect safer conception methods for HIV-serodiscordant couples. The authors have proposed that even though the framework was based on research done in South African settings that it can be adopted for any other country in Africa or any other place in the world. This frame-work can be used to inform nurses of the different domains and determinants that should be taken into consideration when guiding serodiscordant couples to achieve their desires for parenthood during preconception counselling. The role of patient education in the conceptual framework has been highly underscored showing the importance of the nurse offering information to the couples on the safer conception methods and also as a way of social motivation.



## **4 AIM AND OBJECTIVES OF THE STUDY**

Fertility desires for most people in Sub Saharan Africa are not altered even after a positive HIV diagnosis. As most of the people infected with HIV are young adults and almost half of HIV affected couple level relationships are serodiscordant, the need to address fertility matters is critical in the face of HIV transmission. Therefore, the aim of this study is to explore the safer conception methods that are available for HIV-serodiscordant couples in Sub Saharan Africa and the nurse's role in helping the couples satisfy their conception desires while also lowering the risk of transmission to the uninfected partner.

To meet the aims these questions have been posed:

1. What are the safer conception methods available for HIV-serodiscordant couples in Sub Saharan Africa?
2. What is the nurse's role in helping the couples achieve conception while reducing transmission risk of HIV to the uninfected partner?

## 5 METHODOLOGY

This is a literature review in which articles that have addressed this issue were reviewed to give an understanding to the subject and thereby answering the research questions. Studies that have looked at the nurse's role in informing and educating the couples about these methods were included to bring out the care aspect of the study.

### 5.1 Data collection

For the purposes of data retrieval, multiple search engines with a variety of key words being used were employed. Data retrieval was done in google scholar and Arcada's academic databases which include Academic Search Elite (EBSCO), Cinahl, Pubmed and ScienceDirect.

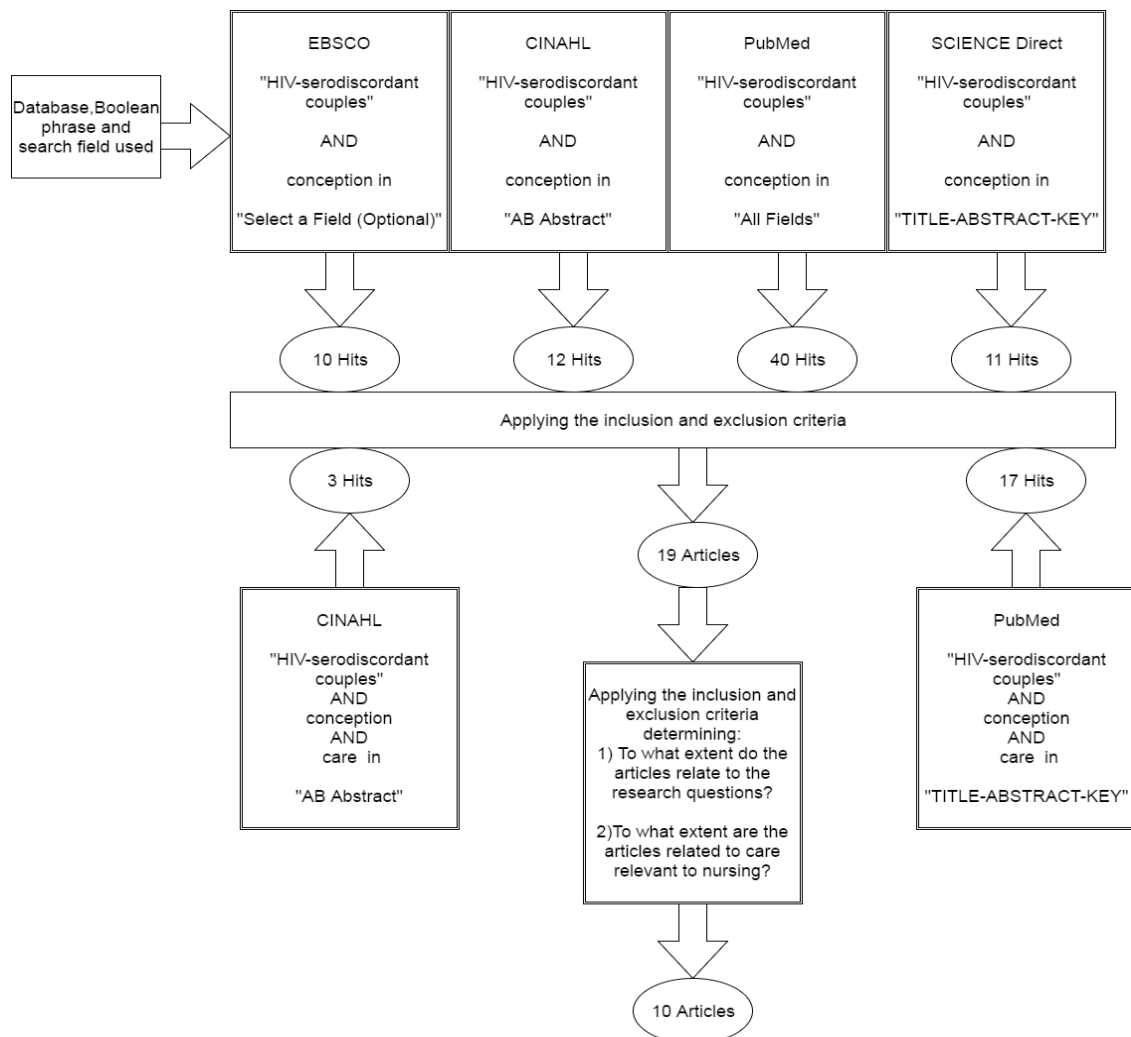


Figure 2. Flowchart detailing data collection and selection of the ten articles

The main search phrases were: HIV serodiscordant couples AND conception, HIV serodiscordant couples AND conception AND care. Reading through the abstracts and the contents of the articles, those which had one or more of the keywords and their relevance to the research questions in this study, 10 articles were chosen for further investigation. The following table details the inclusion and exclusion criteria used to select the ten articles.

*Table 1. Exclusion and inclusion criteria*

Inclusion criteria	Exclusion criteria
Articles in the English language	Articles in other languages
Articles that had the key words “HIV serodiscordant couples and conception” or had the keywords in the text	Articles that dealt with other matters concerning HIV discordancy
Articles whose focus was on Sub Saharan Africa	Articles whose focus was other parts of the world
Articles from 2007-to date	Articles older than 2007
Free full text articles	Articles which were not freely available

#### List of chosen articles

The following 10 articles were chosen based on the inclusion and exclusion criteria given in the table above.

1. Bekker. L., Black. V., Myer. L., Rees. H., Cooper. D., Mall, S., Mnyami. C., Conradie. F., Mahabeer, I., Gilbert. L. and Schwartz S. (2011). Guideline on safer conception in fertile HIV-infected individuals and couples. *Southern African Journal of HIV Medicine*.12(2).
2. Breitnauer, B. T., Mmeje, O., Njoroge, B., Darbes, L. A., Leddy, A., and Brown, J. (2015). Community perceptions of childbearing and use of safer conception strategies among HIV-discordant couples in Kisumu, Kenya. *Journal of the International AIDS Society*, 18(1), 19972.
3. Chadwick, R.J., Mantell, J.E., Moodley, J., Harries, J., Zweigenthal, V. and Cooper, D., (2011). Safer conception interventions for HIV-affected couples:

- implications for resource-constrained settings. *Top Antivir Med*, 19(4), pp.148-55.
4. Finocchiaro-Kessler, S., Wanyenze, R., Mindry, D., Bayeza-Kashesya, J., Goggin, K., Nabiryo, C. and Wagner, G. (2014) "I may not say we really have a method, it is gambling work": Knowledge and acceptability of safer conception methods among providers and HIV clients in Uganda, *Health Care Women Int*, 35(0), pp. 896–917.
  5. Heffron, R., Pintye, J., Matthews, L. T., Weber, S., and Mugo, N. (2016). PrEP as peri-conception HIV prevention for women and men. *Current HIV/AIDS Reports*, 13(3), pp. 131–139.
  6. Okeoma, M., Cohen, C.R. and Cohan, D. (2012) Evaluating Safer Conception Options for HIV-Serodiscordant Couples (HIV-Infected Fe-male/HIV-Uninfected Male): A Closer Look at Vaginal Insemination. *Infectious Diseases in Obstetrics & Gynecology*. Article ID 587651 pp. 1-7.
  7. Okeoma, M., Cohen, C.R., Murage, A., Ong'ech, J., Kiarie, J. and van der Poel, S. (2014) Promoting reproductive options for HIV affected couples in sub Saharan Africa. *BJOG*, 121(5), pp. 79–86.
  8. Okeoma, M., van der Poel, S., Workneh, M., Njoroge, B., Bukusi, E., and Cohen, C. R. (2015). Achieving Pregnancy Safely: Perspectives on Timed Vaginal Insemination among HIV-Serodiscordant Couples and their Healthcare Providers in Kisumu, Kenya. *AIDS Care*, 27(1), pp.10–16.
  9. Matthews, L.T., Bajunirwe, F., Kastner, J., Sanyu, N., Akatukwasa, N., Ng, C., Rifkin, R., Milford, C., Moore, L., Wilson, I.B., Bangsberg, D.R., Smit, J.A. and Kaida, A. (2016). "I Always Worry about What Might Happen Ahead": Implementing Safer Conception Services in the Current Environment of Reproductive Counselling for HIV Affected Men and Women in Uganda. *Biomed Research International Volume*, Article ID 4195762.
  10. Matthews, L. T., Smit, J. A., Cu-Uvin, S., and Cohan, D. (2012). Antiretrovirals and safer conception for HIV-serodiscordant couples. *Current Opinion in HIV and AIDS*, 7(6), pp.569–578.

## **5.2 Content analysis**

A content analysis of the ten articles was done through the approach introduced by Graneheim & Lundman (2004), which is described as a qualitative method of data analysis through a systematized process involving classification, evaluation, and unbiased verification of qualitative data. Using this method, this study uses the deductive content analysis which involves reading through the texts of the articles chosen for the literature review to attain an understanding and to obtain the manifest and latent meanings contained in the texts. The authors explained that the apparent meaning of the text is known as manifest content while the fundamental or bottom line of the text is known as latent meaning. The full text being read and reviewed is called unit of analysis in which case here it was the ten articles chosen. The phrases, words, texts or paragraphs that are related to each other in terms of their content and context are known as meaning units. Codes are markers that are put on meaning units for classifying them together. These codes that have similar content are then put together into categories. Themes consist of a sequence of categories that identifies a major element in the content analysis. The researcher first read all the ten articles that had been selected after the inclusion and exclusion criteria had been applied. The reading process was repeated and in this process meaning units were highlighted and coded according to the manifest content of the text. These codes were based on their relationship to the keywords used in the research. The keywords were highlighted with colored markers for easier identification when needed and for easier coding.

## **5.3 Listing and categorizing the codes**

During the data analysis process, the notes made in the margins in the first step were analysed and the information listed down processed again. Going through the information another time the pieces of information were put together with the related codes and then placed into their relevant categories. Emerging sub themes were then divided into categories as they came up during the analysing of the latent meaning of the data. Each of the articles was read one at a time to prevent the influence of the other articles on the researcher's understanding and interpretation of the data.

Table 2 Theme, sub themes and categories formed from the content analysis.

Theme	HIV-serodiscordant couples and conception			
Sub themes	Positive male partner: risk reduction practices	Positive female partner: risk reduction practices	Nurses role	Gender power dynamics and cultural factors
Categories	Antiretroviral therapy (ART) Pre-exposure prophylaxis  Natural conception Vaginal insemination	Antiretroviral therapy (ART) Pre-exposure prophylaxis Male circumcision Natural conception Sperm washing	Information Client education	Male dominance  Social norms Couple level communication

## 5.4 Research ethics

The researcher used the standard and instructions that have been laid down by Arcada University of Applied Science and the ethics rules that guide scientific writing. This was ensured by not copying the material written down in this thesis directly from a source. The writer referenced the information gotten from the articles and paraphrased it to ensure that rules against copy pasting were adhered to. In the process of data analysing, reading and assessing the articles individually so that the data from the different articles would be assessed individually in a bid to minimize the possibility of generalizing of the information in the articles. This was important as each of the articles introduced new information as well as expounding on what had already been found in the previous ones. In the whole process of presenting the methodology used in this thesis that is the data collection, analysis and interpretation the researcher has endeavoured to be objective to prevent bias and personal views.

## **6 FINDINGS**

The findings of the content analysis showed that there are low cost safer conception methods that HIV-serodiscordant couples in Sub Saharan Africa can adopt to reach their goal of reproduction while reducing transmission risk to the uninfected partner. Before these conception methods can be utilised, interventions should be put in place to optimise prevention of transmission of HIV. The findings showed that there are many factors affecting realisation of the fertility goals including the nurse's role in assisting the couples by giving information and education on the interventions and methods. Gender power differences, cultural and societal norms in Sub Saharan Africa were shown to greatly affect decisions concerning conception. Lack of knowledge of these methods and unavailability of some due to resource constraints were shown as impediments to their use by the couples.

### **6.1 Risk reduction practices**

These are the pharmacological and behavioural methods that couples can adopt in a bid to reduce HIV transmission risk to the uninfected partner during conception. They are divided into interventions and safer conception methods. Interventions that should be in place before conception plans are made are similar for when the man or the woman is the infected partner except for male circumcision when the woman is the positive partner in the relationship. According to Heffron et al (2016) before any safer conception plans are made, it is important for the HIV infected partner to have their viral load suppressed by use of effective ART. The CD4 count cells in the blood should be high as this prevents infection and sexually transmitted diseases should be screened for and treated if present. The authors explain that risk of transmission is minimized when the infected partner is on ART thereby having their viral load lowered and in some cases undetectable. Breitnauer et al (2016) noted the importance of the nurse educating the couples that even though the virus may not be detected in the viral assessment that it doesn't mean it's completely eradicated and as such the importance of continuation of safe sex practices was shown by the authors. Bekker et al (2011) stated that it would be ideal for the couple to wait for 3-4 months while the infected partner is adhering to the ART to give the medication enough time to lower the viral load completely and build up the immunity of the person. When the woman is the infected partner in the relationship, Okeoma et al

(2012) showed the need for the male to be circumcised as this hinders the virus from gaining quick access through the foreskin into the body. This is due to the foreskins susceptibility to tears and bruises during sex thereby producing ulcerations through which it is easier for the virus to enter a man's body. According to the authors adequate healing time should be given for the man prior to sexual activity to prevent tears and inflammation which could increase the risk of transmission. Mathews et al (2016) explained that pre-exposure prophylaxis involves a HIV-uninfected individual using antiretroviral medication for a period of time before and after having unprotected sex to minimize the risk of getting infected with the virus. The authors stated that use of topical gels containing microbicides which kills the virus once it gets into contact with it is also under investigation to be used alongside with the medication. Prophylaxis is to be used as intervention for the uninfected partner for when the man or the woman is the infected partner. Infertility was cited by Bekker et al (2012) as a factor that should be considered as many people living with HIV have to deal with such as tubal infertility has been observed in HIV-seropositive women while in HIV- seropositive men low sperm counts have been observed. These fertility issues may further be complicated by the fact that antiretroviral therapy has been linked to causing fertility problems in men and women taking them. In the light of this information there is need for screening for infertility before conception plans are made as this will reduce the risk of exposure to the uninfected partner in the methods where there is sexual contact (Chadwick et al, 2011).

Concerning the safer conception methods, Okeoma et al (2015) argued vaginal insemination as the most feasible method that can be used in low income settings such as found in Sub Saharan Africa for HIV-serodiscordant couples as it is cost effective. Okeoma et al (2012) explained that this process involves the introduction of semen into a woman's reproductive tract without sexual encounters in the fertile period during her cycle. Semen is collected in a water- based condom during sex or ejaculated into a clean container. The semen is shortly aspirated into a needleless syringe and deposited into the woman's vagina by herself or her partner. It does not need to be done in a health care facility thereby making it cost effective and no sexual contact therefore zero risk of transmission to the male partner. The authors showed that the couple would need education on how to perform the procedure from the nurse.

Matthews et al (2014) noted that when the woman is the infected partner, natural conception is an option for the serodiscordant couples in which sexual intercourse is timed



to the woman's fertile window. This is combined with interventions including that the man to be circumcised and preconception prophylaxis to be adhered to in reducing risk of transmission (Okeoma et al, 2012, Heffron et al, 2016). Okeoma et al (2014) showed that natural conception is also viable when the man is the infected partner, with prophylaxis being offered to the woman. The sex is limited only to the woman's fertile period. The authors explained that the use of screened donor semen is to be given as an option for the couple to completely eradicate the risk of transmission. Bekker et al (2011) noted that most of the research that has been done in Sub Saharan on safer conception methods for this population has centred on when the woman is the positive partner. This is because for HIV positive men in this region, safer conception methods for example sperm washing are expensive and must be combined with other high technology methods like IVF or ICSI for conception to take place. Due to poverty, the authors explained, most couples are not able to afford these methods. Sperm washing is available in developed countries for HIV-serodiscordant couples. Breitnaeur et al (2016) showed that there are religious, cultural, technical and religious barriers concerning the safer conception methods that have to be overcome through patient education.

## **6.2 Nurse's role**

Matthews et al (2016) showed that understanding HIV-serodiscordance and fertility desires are important aspects that contribute to a nurse's role in this context. In their study tension was revealed between the nurse's attitudes towards serodiscordant couples conceiving and the reproductive desires of the couples. It was also noted that the nurses in most cases have no problems counselling about condom use to prevent transmission as they did regarding safer conception methods. This is shown as most nurses discourage pregnancy in a bid to reduce transmission risks between the partners and from mother to child. According to Chadwick et al (2011), comprehensive health services for people living with HIV and their partners should address their fertility matters. Understanding the different factors that affect reproductive decision making and addressing the factors will help the nurses support the couples to have choices thereby lowering risk of transmission. Being informed and up-dated on serodiscordancy and the feasible methods that can be used by the couples to achieve pregnancy is an important aspect for the nurses (Okeoma et al, 2014, Kessler et al, 2014, Chadwick et al, 2011).

### **6.3 Gender power dynamics, cultural and societal norms**

Bekker et al (2011) showed that gender power dynamics has a lot of influence in Sub Saharan Africa where male partners have a crucial role in the reproductive decisions that are made by the couples showing the importance of including men in the counselling for safer conception methods and interventions. The authors stipulated that the cultural context in which the women are supposed to be submissive and not be in opposition of the decisions that their partners make places them at risk of contracting HIV in a bid to satisfy the desires of their partners and the social expectations placed on them. Most women in Sub Saharan Africa are dependent on their male partners for economic upkeep which results to male dominance even in the face of risk of transmission of HIV. Poverty therefore is a determining factor in the power play experienced in this region. Pintye et al (2012) noted that the indication when it was the woman who wanted to conceive it involved negotiation with the male partner in contrast to when the man was the partner who had the high fertility desires was observed in their study. According to Bekker et al (2011) children are viewed as a way to maintain relationships by women in Sub Saharan Africa and an indication of an individual's worth for the men, and as such the awareness of the safer conception methods would help the couples engage in risk reduction strategies in order to protect the desired child. Intimate partner violence affects many women, therefore education for both parties is important to bring understanding of how the factors that affect the relationship could affect their reproductive decisions and outcomes. This may happen if the woman is not able to conceive or due to other factors (Breitnauer et al, 2016).

## **7 DISCUSSION**

HIV infection and reproduction share an intricate relationship as they have a common ground that is sexual intercourse. As mentioned in the aim of the study, fertility desire in most people is not affected by HIV diagnosis and therefore doesn't cause significant results in reproductive behavioural changes. In HIV-serodiscordant relationships, reproduction desire mostly overrides transmission risk fears and as such safer conception strategies for HIV-serodiscordant couples are important aspects to effectively curb risk of HIV transmission between the partners when couples decide to fulfil their parental desires. The literature reviewed for this paper as well in the conceptual framework showed that there are low cost safer conception strategies available for HIV-serodiscordant couples in Sub-Saharan Africa with interventions being put in place alongside the strategies. Emphasis was laid on the importance of integrating reproductive healthcare in the routine care of HIV infected individuals to provide options for the couples to use while lowering the risk of transmission.

### **7.1 Interventions and safer conception practices**

As explained in the risk factors that affect acquisition or transmission of HIV, a fully suppressed viral load lowers infectiousness of the HIV infected individual. This is however dependent on the patient's adherence to the antiretroviral therapy as some individuals may not be consistent in the uptake. This allows the virus to continue replicating even though the individual is on ART. In this case when the couples are considering pregnancy adherence to ART by the infected partner is very important to lower the risk of transmission to the uninfected partner and the desired child. Lack of viral load assessment is an obstacle in Sub Saharan Africa as it may not be always available due to resource constraints thereby the couples may not know for sure that the viral load is suppressed making it risky to have unprotected sex. This should be taken into consideration as the information about the intervention is given to the couples (Okeoma et al, 2015). Pre-exposure prophylaxis involves the uninfected partner taking HIV medications continuously before and after exposure to unprotected sex to minimise risk of HIV acquisition. This should be done before the anticipated fertility days for the woman. Although one is protected by taking the medication 24 hours prior to the sexual act, it is advocated to start pre-exposure prophylaxis at least 2 weeks before the fertile

window. This means at the onset of menstruation days for the woman is an ideal time. It should be discontinued and couples encouraged to resume condom use as soon as there is a positive confirmation of pregnancy. Pre-exposure prophylaxis is affected by adherence as it works well when there is consistency of the drug intake. This happens when the HIV negative partner has high build-up of the antiretroviral drugs in their bloodstream, rectum and genital tract before exposure to HIV virus. If during the sexual act there is exposure to the virus, the ARVs stop the virus from entering the cells and replicating (Chadwick et al, 2011). Male circumcision is used as a risk reduction strategy when the woman is the infected partner and can have a success rate of 38-66% over a period of 2 years as the removed foreskin is considered a potential access point for the HIV virus. All the interventions involve both partners and should be discussed with the nurse providing the information on how to combine them for positive outcomes (Okeoma et al, 2012).

In Sub Saharan Africa, due to resource restraints low cost conception strategies are advocated for to enable couples to make use of them. Natural conception and artificial insemination are given preference as they involve no or very little cost making them available to the couples. There are challenges affecting the use and effectiveness of the methods. These include technical, cultural and religious barriers surrounding vaginal insemination. The cultural barriers towards vaginal insemination in Sub Saharan Africa include that some couples may view it as unnatural as it involves touching of the genitalia in a non-sexual manner and maybe unwilling to carry it out. The technical barriers are that the couple should get used to handling the equipment and using them effectively. In some communities, handling of semen outside of the body is regarded as sin and helping the couples overcome these barriers through education is a priority (Okeoma et al, 2015). Other challenges include that most women may not be conversant with their fertile days thereby challenging the efficacy of the methods. Menstrual cycles may differ from month to month making a woman's ability to articulate their fertile days to be a barrier. However, these challenges can be overcome through education by nurses on how to observe the cervical mucus and counting of the fertile days. Continued counselling will help the couples overcome the challenges and use the methods effectively to achieve the desired results. There is the concern that when couples are advised to have sex without condoms even if for conception purposes and for a brief period, that this may have negative effects on the condom use always campaign with HIV-positive partners and thereby putting

public health at risk. Condom use has been the focus since the HIV/AIDS pandemic was first discovered as a basic measure of prevention. The conceptual framework shows that individual and couple level information on HIV transmission is important as information will motivate the couples to resume condom use as soon as conception is realised to protect the uninfected partner and the desired child. All the conception strategies should be carried out on the woman's fertile period to avoid failure and prolonging of the process (Crankshaw et al, 2011).

## **7.2 Information and education**

According to Kourkouta and Ioanna (2014) patient information and education are essential components of good patient outcomes. The authors identified these as important elements of the nursing process. This has also been exemplified in the conceptual framework by Crankshaw et al (2012) that information offered to individuals and couples would motivate them to practice the risk reduction strategies in a bid to protect their partner and the desired child from acquiring HIV. The framework adopted for this study recommends that nurses should optimise their role by advocating for HIV risk reduction strategies for HIV-serodiscordant couples under their care who desire to conceive. By addressing these issues, they would be practicing patient safety by making information available and offering social support for the couples. Nurses can influence individual or couple level actions by supporting and encouraging the couples to engage in risk reduction methods. Lack of information on the safer conception practices is a barrier to HIV risk prevention behaviours.

There are three clinical issues that nurses should address in supporting HIV-serodiscordant couples achieve their fertility desires that is maintenance of the HIV infected partner's health at optimal levels, preventing mother-to-child transmission when the woman is the positive partner and preventing transmission to the uninfected partner. Treatment and or management of pre-existing diseases like hypertension, sexually transmitted diseases, tuberculosis and others which suppress the immunity of a person thereby increasing the risk of the partners either acquiring or transmitting HIV should be included in the nursing plan to ease conception plans and reduce risk of transmission of HIV (Okeoma et al, 2012). It has been suggested that incorporating fertility education into the clinical care of the infected partners will make it easier for the nurses to broach

the subject and motivate the individuals to talk about their fertility desires. It is critical for the nurses in Sub Saharan Africa where issues on fertility normally revolve around women to also enquire of their male patients on their fertility desires (Matthews et al, 2012).

Couples who want to have children may not always reveal their fertility plans to the nurses due to the stigma that surrounds sexual activity and reproduction in HIV- serodiscordant couples. General stigma that has been there since HIV was discovered has been the fear HIV positive individuals could only have HIV positive children and there was 100% risk of transmission to the partner. This was a problem before due to lack of knowledge on HIV and transmission prevention practices which have been under development in recent years. Community education on HIV has played a great part in eradicating some of the stigma but there are misconceptions that still should be overcome by information and education. Stigma towards HIV-serodiscordant couples who want to conceive should be eradicated from healthcare settings for effective care delivery to be realised. Training and education for the nurses is an important step in eradicating perspectives that hinder comprehensive care for this population which includes addressing fertility desires. There is the notion that due to the problems that couples face when using condoms, they may not adhere to limiting unprotected sex only during the fertile period but might go on even after conception has occurred therefore increasing the risk of transmission. The nurse should counsel and motivate the couples on not infecting their partners and the desired child. Complaints related to condom use include that it reduces the urge for sex and premature ejaculation (Kessler et al, 2014).

### **7.3 Decision making dynamics affecting conception**

The birth of biological children in HIV-serodiscordant couple's partnership gives it legitimacy in the eyes of the society and a legacy for the parents to leave behind. The importance of children therefore for every couple relationship in Sub Saharan Africa is shown in the context of the relationship, extended family relationships and societal expectations placed on the couple. Children hold the couples together and lack of children often causes infidelity and at times dissolution of relationships. In this context women may have children and risk HIV transmission to keep their spouses (Breitnauer et al, 2015). Knowledge and use of the safer conception methods is very necessary to reduce

risk of acquiring and transmission of HIV in serodiscordant relationships. There is an imbalance of gender power in Sub Saharan Africa often favouring male partners in the relationship therefore resulting in male authority in fertility decision making. Connell's (1987) theory on gender analysed disparities between men and women which is evident in Sub Saharan Africa. The theory explains that financial inequality, male authority and social norms place women at a disadvantage and especially in this culture where men are acknowledged to be leaders of the families by the society. The expectation is that women should be docile and obedient to their husbands as most of the women are dependent on the men for their upkeep. In some communities women are counted to be part of the husband's possessions and not an equal partner in decision making in the home. Women are seen as caregivers while men are breadwinners for their families. These social norms result in the power differences whereby men tend to domineer women even in decisions concerning conception. The conceptual framework by Crankshaw et al (2012) showed couple level communication as one of the ways to influence the use of safer conception methods. According to the framework lack of autonomy by women in relationships affects communication between couples which leads to decisions being one sided. In their study the authors noted that many HIV-serodiscordant couples have very little communication concerning sex which is detrimental in relationships as they cited communication as very critical for the safer conception strategies and interventions to be effective. Effective sexual behaviour including condom use, sex during the fertile period in a woman's cycle so that conception can occur must be discussed between the couple to optimise the outcomes. The authors advocated for couples to undergo counselling to improve communication and nurses should educate the couples on the gender norms and their effects on the success of the HIV risk reduction interventions and safer conception strategies (Crankshaw et al, 2012).

## **8 CONCLUSIONS**

The findings of this study were based on the two research questions which aimed at exploring the safer conception methods available for HIV-serodiscordant couples in Sub Saharan Africa and the nurse's role in informing and educating the couples who wish to fulfil their parenthood desires. HIV-serodiscordance is prevalent in many countries in Sub Saharan Africa and addressing this population's fertility needs has been cited as important in prevention of HIV transmission. The various methods that are available have been put forward together with the interventions that should be put in place to reduce the risk of transmission to the uninfected partner. As Sub Saharan Africa is a resource constrained setting some of the methods that are in use in developed countries are not available in this region. Knowledge of the methods and how to use them poses a challenge to couples in which case the nurse's role is highly emphasized. Information and education therefore have been cited as important for couples to achieve this goal as shown in the conceptual framework. There are ethical dilemmas that need to be addressed including the possibility of mother –to-child transmission. This has been addressed in the research and provision of drugs that help in preventing mother to child HIV transmission which goes hand in hand with safer childbirth and breastfeeding practices. The risk of horizontal transmission which is not completely eradicated with the safer conception methods is a factor that has to be dealt with. Acknowledging that without these methods the transmission risk is much higher as the couples will engage in risky behaviour in a bid to conceive is the perspective to have in this case.

### **8.1 Recommendations**

Introduction of guidelines for the nurses to work with concerning fertility for HIV-serodiscordant couples would make this a national effort in every country in Sub Saharan Africa and help to give adequate care for the couples and optimise good patient outcomes. Lack of guidelines was cited as a barrier to effective integrated health care for people living with HIV. Policy makers should address the issues that are faced by this population by facilitating availability of more safer conception methods when the man is the infected partner for example sperm washing as currently this is not available in many countries of Sub Saharan Africa. Improvement of services related to HIV including early access to ARVs helps the infected partner's body to regain health therefore laws and policies that



favour these services should be implemented. This study recommends employment of more health personnel as most of the studies showed that the patient ratio to nurses is very high in Sub Saharan Africa therefore having a high clinical workload, leaves the nurses with no time to address fertility matters of their patients. Research on this issue in Finland would enlighten couples who are affected and offer them the information they need to make informed decisions on safer conception.

## **8.2 Limitations of the study**

Though this study has achieved its goal of answering the research questions posed at the beginning there were limitations which accompanied the search for the answers. As this was a literature review the articles dealing with this issue were limited. This is an area of study that not much research has been conducted in, compared to other issues surrounding HIV. There was little information on the methods available for the couples when the man is the infected partner. Information on serodiscordancy in Finland and about couples who desire to conceive was not available limiting the scope of the study. Some of the articles which would have been good for the study were not accessible as they were not in Arcada's database therefore restricting availability.

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## APPENDICES

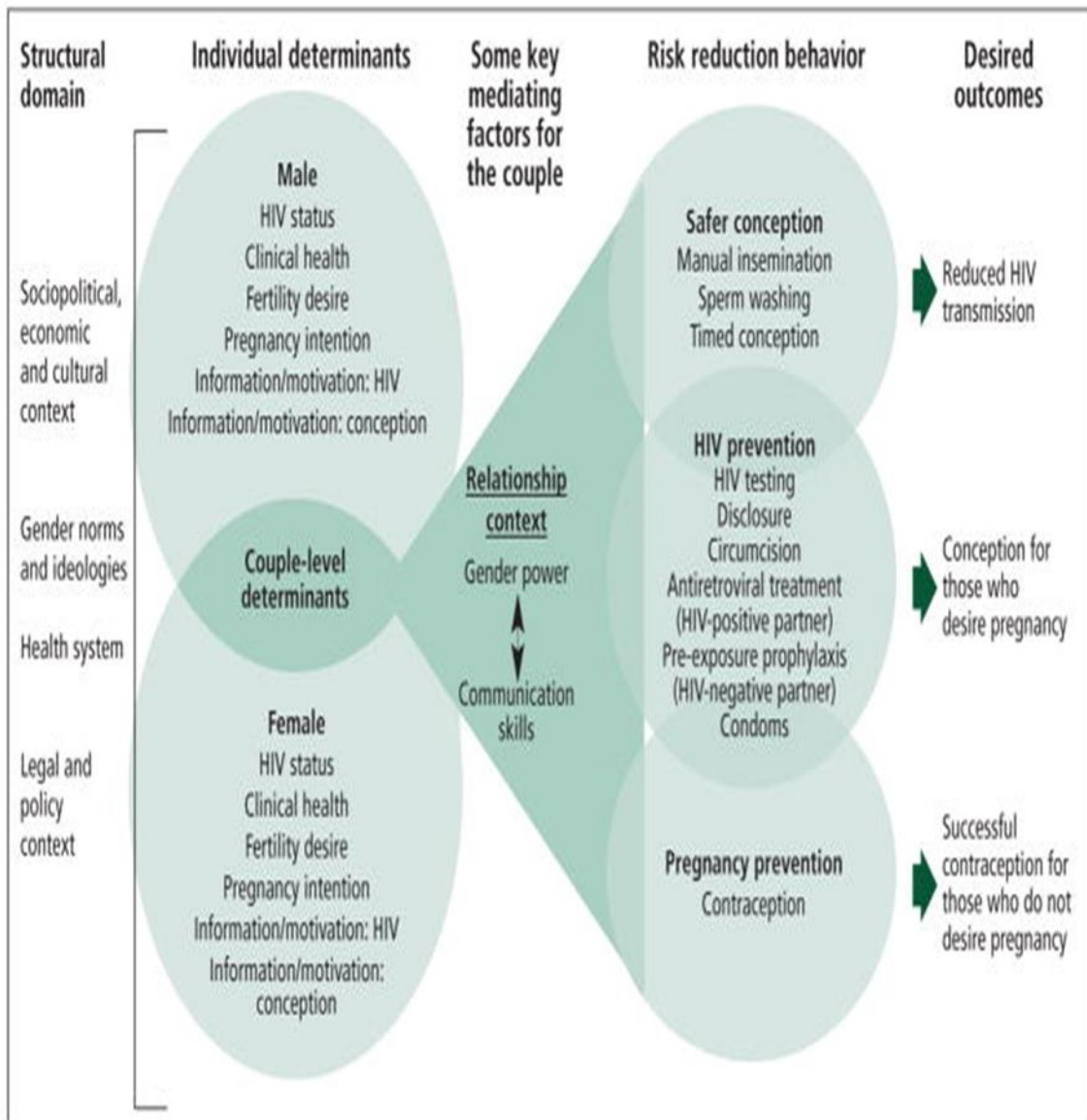


Figure 3 A conceptual framework for understanding HIV risk behavior in the context of supporting fertility goals among HIV- serodiscordant couples (Crankshaw et al. 2012).