HIGH-RISK SEX PRACTICE AND ITS DETERMINANTS AMONG HIV-POSITIVE WOMEN ON HIV CARE SERVICES: A CASE OF THIKA LEVEL 5 HOSPITAL, KIAMBU, KENYA

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Science (Biostatistics) in the School of Pure and Applied Sciences of Kenyatta University

September, 2014
DECLARATION

This thesis is my original work and has not been presented for a degree in any other University or any other award

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DEDICATION

I dedicate this thesis to my family members who have been very supportive and understanding. Without their love and encouragement this journey would have been long and bumpy.
ACKNOWLEDGEMENTS

I wish to thank the Almighty God for giving me health, determination, and perseverance in writing this thesis. Deep and sincere gratitude go to the HIV-positive women in Thika Level 5 Hospital who regardless of their health situation agreed to participate in this study. The staff of the Comprehensive Care Centre who facilitated sampling, interviewing and data collection from the respondents cannot go without being congratulated for their time and hard work without pay.

My thanks in particular go to my supervisors, Dr. James Kahiri and Mr. Elias Obudho for their guidance and support in writing this thesis. Special thanks go to Dr. Ouma Onyango for guidance in making corrections after defense of this Thesis. The Mathematics Department especially the former Chairman, Dr. David Malonza, did a lot to make sure that we went through the course as pioneers without a lot of hardships.

Lastly but not the least I would like to thank and wish success in life to my classmates. We spent days supporting each other throughout the process of pursuing the Masters program.
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<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>AOR</td>
<td>Adjusted Odds Ratio</td>
</tr>
<tr>
<td>ART</td>
<td>Antiretroviral Therapy</td>
</tr>
<tr>
<td>ARV</td>
<td>Antiretroviral</td>
</tr>
<tr>
<td>CCC</td>
<td>Comprehensive Care Center</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
</tr>
<tr>
<td>HAART</td>
<td>Highly Active Antiretroviral Therapy</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>KDHS</td>
<td>Kenya Demographic Health Survey</td>
</tr>
<tr>
<td>OR</td>
<td>Odd Ratio</td>
</tr>
<tr>
<td>PLHIV</td>
<td>People Living with Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>STIs</td>
<td>Sexually Transmitted Infections</td>
</tr>
<tr>
<td>UNAIDS</td>
<td>Joint United Nations Programme on HIV/AIDS</td>
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<tr>
<td>UNHCR</td>
<td>United Nations High Commissioner for Refugees</td>
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</tbody>
</table>
DEFINATION OF TERMS

ARVs  Medications for treatment of HIV infections. When three or four such drugs are taken in combination the approach is known as HAART (Olley et al., 2008).

Casual partner  A partner the respondent had sex with only once or rarely and was not living with or married to (Sarna et al., 2004).

High-risk sex  Unprotected sexual intercourse (Olley et al., 2008).

Logistic regression  A type of regression analysis used for predicting the outcome of a binary categorical criterion variable based on one or more predictor variables.

Regular partner  A spouse or someone with whom the respondent lived or had a stable relationship (Sarna et al., 2004).
ABSTRACT

HIV/AIDS remains a major health issue in Kenya and in the whole world. Over 34 million people are currently living with the HIV and a majority of them are in the Sub-Sahara Africa; a big pool for potential HIV transmission. In Kenya, out of a population of 40 million, over 1.6 million are HIV infected and approximately 100,000 new infections are realized yearly, most of them through unprotected sexual intercourse. This study sought to estimate the prevalence of high-risk sex and to identify its determinants among the HIV-positive women undergoing HIV care in Thika Level 5 Hospital. A total of 467 participants were drawn through systematic random sampling from the population of HIV positive women attending HIV care services. Data was collected from those who passed the inclusion and exclusion criteria by using face-to-face interviews. The data was analyzed using Statistical Package for Social Sciences (SPSS) where descriptive statistics and inferential statistics were computed. The results showed that high-risk sex is prevalent among the HIV-positive women undergoing care as 39% of the respondents reported not to have used condoms during their last sexual activity. Disclosure of HIV status, Relationship control, Time on ART, Drugs use, and Stigma in bivariate analyses was significantly associated with high-risk sex at the significance level of 0.05. In the multivariate analysis the variables Time on ART, Partner type and Disclosure*Stigma interaction term remained significant in predicting high-risk sex. The study associated long Time on ART to high-risk sex. Casual partnerships were 7 times associated with high-risk sex than regular partnerships. A combined Non-disclosure and Stigma influenced high-risk sex practice two-fold. The study concluded therefore, that the determinants of high-risk sex among the HIV-positive women on care are long time on ART, Casual or mixed sexual relationships, Stigma, and Non-disclosure. The study recommended that the PLHIV should be given the right preventive information and be cautioned that being on ART for long is not a permit to stop using condoms. Stigma coping-skills training should be given to the patients and be made to accept and live with their condition without transmitting the virus to others. The government and the donor community have also been urged to provide resources to help develop interventions that reinforce safe sex practices and also put up infrastructure for improving the socio-economic conditions of the PLHIV.
CHAPTER ONE

INTRODUCTION

1.1 Background

HIV/AIDS pandemic still remains a major challenge to Public health in Kenya and the world over. In the year 2011, over 34 million people were living with HIV; and over 70 percent of them were in the developing countries (UNAIDS, 2012). By the end of 2012, the same report depicted that, 2.5 million new infections were realized globally out of which 1.6 million were in the Sub-Saharan Africa (UNAIDS, 2012). Recent surveillance data in Kenya estimate the burden of adult HIV prevalence to be 5.6 percent and close to 1.2 million Kenyans are living with the HIV (KAIS, 2013). In all the above cases women are said to carry the biggest infection burden of HIV. In Kenya women had an overall prevalence 6.9 percent compared to men’s prevalence of 4.4 percent (KAIS, 2013).

The patterns of HIV transmission are different among different regions of the world (Gouws et al., 2006). According to Gouws et al. (2006), new infections in Kenya are mainly transmitted through heterosexual contact (90%), while a small but a significant number are related to injecting drug use (4.8%) and men who have sex with men (4.5%). Contrary to Kenya and other Sub-Saharan countries, in the United States and other developed countries, male-to-male transmission of HIV accounts for the highest share, followed by heterosexual transmission and through injection drug use (UNAIDS, 2002).

An array of factors including social, economic, cultural and medical have been shown to contribute to High-risk sex in the developing world. With the advent of the increased use of ART in Kenya, more PLHIV are living longer, healthier and possibly more sexually active
lives (Scheer et al., 2001; UNAIDS, 2010). As a result of recognizing that HIV is mainly spread through risky behaviours that can be avoided, the National government of Kenya has taken actions against HIV/AIDS including programs on control of STIs, availing of condoms and medications, and counseling to the HIV-infected individuals. This has bore some fruits as a drop in the national HIV prevalence rate (from 6.2% to 5.6%) has been realized (KAIS, 2013).

Many HIV-infected individuals avoid sexual practices that are likely to transmit the HIV, but substantial numbers continue to engage in unprotected sex (Traore, 2005; Dessie et al., 2011). Although Kenya’s HIV prevalence has seen a drop, approximately 100,000 new infections were witnessed in the same report period (KAIS, 2013). Unprotected sexual intercourse among persons receiving ART is a concern because of the risk of HIV-transmission to HIV-negative partners (Milam et al., 2006). Understanding the determinants of high-risk sex among the HIV-positive women is essential to inform the design and implementation of targeted prevention and risk reduction programs to address the issues of HIV-transmission (Aidala et al., 2006). To achieve this result, the study adopted logistic regressions modeling. For this study, the term “high-risk sex”, was taken to mean any unprotected sexual intercourse during the last 6 months prior to this study.

1.2 Problem Statement

Although HIV prevalence in Kenya may have dropped to around 5.6% overall (KAIS, 2013), new HIV infections have been estimated to be 100,000 annually (KAIS, 2013). This is a pointer to the effect that despite the risk-reduction counseling and condom distribution, HIV infections continue to spread. It has also been pointed out elsewhere that the STIs among the
HIV-positive individuals were on the increase (UNAIDS, 2002). Outbreaks of STIs among PLHIV suggest ongoing risk behaviours (McGowan et al., 2004).

While one could expect persons who never had firsthand experience with HIV to practice high-risk sex, it is of concern to see PLHIV continue with high-risk sex practices as they not only place themselves at a greater risk for re-infections with new and more resistant strains of the virus, but also put others at risk for HIV infection and hence sustaining the epidemic.

1.3 Justification

Many studies have investigated the persistence of high-risk sex and its correlates among the people living with HIV/AIDS, but majority of those studies have concentrated on men who have sex with men and the studies happened mostly in the developed countries (Ncube et al. 2012). Experiences from developed countries’ settings are of limited value when addressing developing countries’ HIV issues and some of the research show contradictory results (Ragnarsson et al. 2011). The developed countries differ enormously with the developing countries in terms of economies, resources, population and technology. Some of the studies reveal a rise in risky sexual practices once ART becomes available whereas others reveal a decrease or no effect (Dessie et al. 2011). For example in a study by Crepaz et al. (2004), HIV-positive patients on HAART did not exhibit increased sexual risk behavior even when therapy achieved an undetectable viral load.

While information on modes of transmission of HIV in Kenya is available at a national level for the general population participating in the demographic health surveys, not much is known about the extent to which the PLHIV might continue to engage in High-risk sex; and also the forces that govern PLHIV’s decision to practice high-risk sex. In particular, little
information exists on risky-sex practices among HIV-positive women in Kenya and thus studies are needed to uncover the forces specific to HIV-positive women that might undermine their ability to adopt and maintain safer sex practices over time. In order to design effective prevention programmes that are able to bring about behaviour change among the PLHIV and hence prevent transmission of HIV infection, a better understanding of High-risk sex among the PLHIV is crucial. This thesis focuses on HIV-positive women undergoing HIV care services in Thika Level 5 Hospital and explores their high-risk sex practices and the factors influencing them to practice the High-risk sex.

1.4 Hypotheses Statements

i. Social interaction factors (disclosure, relationship control, and emotional support) are not associated with high-risk sex among the HIV-positive women on HIV care services.

ii. HIV and safer-sex knowledge factors (ART and condoms knowledge, and safe-sex effectiveness) are not associated with high-risk sex.

iii. Health status and contextual factors (Time on ART, drugs use, and desire for children) are not associated with high-risk sex.

iv. Psychological factors (stigma, depression and discrimination) are not associated with high-risk sex among the HIV-positive women on HIV care services.

1.5 Objectives

The study had the following objectives.
1.5.1 General Objective

The overall objective of this study was to improve the understanding of the High-risk sex practice among the HIV-positive women and to provide evidence based information to guide the HIV prevention programmes in Kenya.

1.5.2 Specific Objectives

i. To estimate prevalence of the high-risk sex among the HIV-positive women.

ii. To fit a model to the data of the HIV-positive women on HIV care services.

iii. To identify the significant determinants of high-risk sex among the HIV-positive women on HIV care services.

1.6 Significance and Anticipated Output

The study sought to identify the determinants of high-risk sex among the HIV-positive people undergoing HIV care services. The information generated will contribute into the closing of the information gaps in determinants of high-risk sex practices among the HIV-positive people in Kenya.

Information generated will be valuable to governmental and non-governmental organizations, as well as to the developmental agencies who work in the field of HIV/AIDS. Better understanding of the determinants of High-risk sex practices will be realized from this study which will be utilized in the developing of programmes aimed at enhancing safe-sex practices and improving the wellbeing of the PLHIV, and more specifically address the specific needs of the HIV-positive women. The results would give justification to the donor communities to scale-up their resources and direct efforts towards the right targets. This
would subsequently help in the reduction of HIV incidence rates. The study findings are also anticipated to stimulate further research in the area of High-risk sex practices

1.7 Conceptual Framework

The following conceptual framework assumes that High-risk sex practice is a function of Social interaction factors, HIV and safer-sex knowledge factors, Health status and contextual factors, and Psychological factors. The study was examining the High-risk sex practices of the PLHIV and its determinants outside of any given theory.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social interaction factors</strong> (Disclosure, Relationship control, and Emotional support)</td>
<td>High-risk sex (HRS)</td>
</tr>
<tr>
<td><strong>HIV &amp; Safer-sex knowledge factors</strong> (ART and Condoms knowledge, Safe-sex effectiveness)</td>
<td></td>
</tr>
<tr>
<td><strong>Health status &amp; Contextual factors</strong> (Time on ART, Drugs use, Desire for children)</td>
<td></td>
</tr>
<tr>
<td><strong>Psychological factors</strong> (Stigma, Depression, and Discrimination)</td>
<td></td>
</tr>
</tbody>
</table>

Source (Author)

Figure 1: Proposed conceptual framework: Integrated model for explaining HIV-positive women’s reasons for practicing high-risk sex
CHAPTER TWO

REVIEW OF LITERATURE

2.1 Theoretical Framework

This study is examining the high-risk sex practice of PLHIV and its determinants outside any given theory. The studied potential predictors are classified into four major categories: Social interaction factors (Disclosure, relationship control, and emotional support), HIV and safer-sex knowledge factors (ART and condoms knowledge, safe-sex effectiveness), Health status and contextual factors (Time on ART, drugs use, and desire for children), and Psychological factors (Stigma, depression, and discrimination). The literature review follows the conceptual framework in Figure 1 and integrates the factors that may help explain the High-risk sex practice among the HIV-positive women.

2.2 Previous Research on High-risk sex determinants among PLHIV

2.2.1 Social Interaction Factors

Human beings are social creatures and interact daily in different situations. Social circumstances can inhibit or motivate ones sexual behavior. Motivation to practice condom use, disclose one’s status, and perceive social normative support from important others, determines one’s level of risky or safer behaviour (Fisher et al., 2009).

A number of studies that have examined the relationship between social interaction factors and high-risk sex among PLHIV have had mixed findings. In a study by Traore (2005), about 56.7% of respondents had a regular partner while 16.9% reported having casual partners. 35% of those with a regular partner and 28% of those with a casual partner reported
inconsistent or no condom use at all. Non-disclosure fuels HIV transmission between partners (Beyeza et al., 2009; Kabiru et al., 2010). Non-disclosure of HIV status to primary partners may occur due to fear of rejection and discrimination, feeling of shame, and a desire to maintain secrecy (Kumar et al., 2007; Mlambo et al., 2011). Increased condom use has been documented among HIV positive people who disclosed their positive status to sexual partners (Traore, 2005; Latka et al., 2006).

Relationship control has also been associated with inconsistent condom use. Pettifor et al. (2004) found that women who had low relationship control were 2.1 times more likely to use condoms inconsistently (95% CI: 1.17-3.78), and those women who experienced forced sex were 5.77 times more likely to inconsistently use condoms (95% CI: 1.86-17.91). Inconsistent condom use was in turn, significantly associated (AOR 1.58; 95%CI: 1.10-2.27) with HIV infection (Pettifor et al., 2004). In a study by Ragnarsson et al. (2011), women were significantly more likely than men to report inconsistent use of condoms. According to that study, this might have been due to lack of individual decision-making power in intimate relations or could relate to social pressure to conceive a child (Ragnarsson et al., 2011). Persons who are able to engage in and negotiate safer sex are more likely to use condoms while those with decreased negotiation skills have higher prevalence of risky sexual practice (Milam et al., 2006).

Those who believe their main partners are unsupportive of condoms are more likely to be inconsistent condom users (Latka et al., 2006).
2.2.2 HIV and Safer-sex Knowledge Factors

Prevention interventions significantly reduce unprotected sex (OR 0.57; 95% CI 0.40 – 0.82) (Crepaz et al., 2006). Crepaz et al. (2006) were of the view that the intervention delivered directly to the individuals concerned, and that which provided skills building for avoiding risk sexual behaviour, had the capacity to significantly reduce risk-sex practices.

Studies have found that persons of lower health knowledge hold more misconceptions of how HIV treatments influence HIV transmission risks. The prevalence of unprotected sex was elevated (OR 0.99; 95% CI: 1.52-2.17) in HIV-positive persons who believed that receiving HAART or having undetectable viral load protects against transmitting the virus (Crepaz et al., 2002). Sarna et al. (2004) observed that 63% of participants indicated that they practiced safer sex less often since the advent of new HIV treatments and 40% believed AIDS was now a less serious threat. A study by Ncube et al. (2012) showed that 1 in 10 PLHIV had low health knowledge, and among those with knowledge less than 50%, were 90% less likely to have used condoms during their last sex.

Self-efficacy to use condoms is also an important predictor for safe sex. Latka et al. (2006) showed that, compared with consistent condom users; inconsistent condom users had lower self-efficacy to use condoms and more negative beliefs about condoms. Those who did not discuss condom use or safe sex (AOR 7.23; 95% CI: 4.14-12.63), having negative safer-sex pleasure (AOR 2.39; 95% CI: 1.52-3.76), and those lacking condom use self-efficacy (AOR 3.29; 95% CI: 2.07-5.23) were more likely to engage in unprotected sex (Dessie et al., 2011).
2.2.3 Health Status and Contextual factors

ART has been associated with risky sexual practices. In a study by Ncube et al. (2012), participants on ARVs were 80% less likely to have used condoms during the last sexual intercourse (OR = 0.2; 95% CI: 0.04-0.6). Shorter time on ART use was significantly associated with inconsistent condom use (Ragnarsson et al., 2011). Patients who had been on ART for more than 19 months had a significant decreased odds of inconsistent condom use compared to those who had been on treatment for less than 6 months (19-24 months; AOR 0.33; 95% CI: 0.12-0.88; and > 2 years: AOR 0.48; 95% CI: 0.25-0.92) (Ragnarsson et al., 2011).

PLHIV are likely to abuse alcohol and drugs at some point during their lives. A history of heavy alcohol use has been correlated with a lifetime tendency toward high-risk sexual practices (Gerbi et al., 2012). In a study by Aidala et al. (2006), 87% of the sample reported lifetime history of using drugs and 37% of these reported one or more episodes of unprotected sex with an HIV-negative or partner of unknown HIV-status.

Desire for children has also been associated with risk sexual practice. Ncube et al. (2012) found that those participants considering future pregnancy were 40% less likely to have used condoms during last sex (OR = 0.6; 95% CI: 0.2-0.9). Consistent condom use (AOR 0.51; 95% CI: 0.27-0.98) was less likely to occur among respondents who desired to have children (Beyeza et al., 2009); although those participants diagnosed with HIV within the preceding year were less likely to wish for more children (AOR 1.8; 95% CI: 0.21-0.86) compared with those diagnosed for a longer period (Iliyasu et al., 2009).
2.2.4 Psychological Factors

The psychological factors that have been studied include stigma, depression and discrimination. PLHIV often have negative experiences such as denial, stigma and mental illness (Reilly et al., 2009). These experiences can have effects on health behaviours and the spread of the HIV as they can lead to non-disclosure (Traore, 2005). Perceived stress and depression were marginally related to sexual risk behaviours (Traore, 2005). Stigma leads to low self-esteem that can in turn lead to substance abuse, difficulties when negotiating for safe sex and hence increase in risk behavior (Folch et al., 2009). In a South Africa study, one third of participants reported experiencing discrimination because of their HIV status and over half reported fearing negative responses if they disclosed their HIV status (Simbayi et al., 2006). Testing at 5% level of significance, Dessie et al. (2011) found that 49.1% of the participants who had perceived stigma in the 3 months prior to the study, were more likely to have engaged in unprotected sex (p = 0.01) than those who had not.

2.3 Summary

The review of the literature of high-risk sex among PLHIV showed that a number of variables affect the HIV patients’ likelihood for practicing high-risk sex activities. Most of the studies reviewed happened in the developed countries and as it was said before, the situations in the developed countries differ remarkably with the situations in the developing countries in terms of economies and technology advancement. The predictors of the high-risk sex practice are also changing through time and space. Most of the studies reviewed used non-probabilistic sampling methods hence making generalization of the findings inappropriate.
This study is utilizing probabilistic sampling method which makes the findings here more generalizable and therefore, a crucial contribution to the past studies’ examination of the determinants of high-risk sex, and more so in the current Kenyan context. The study is estimating the prevalence of high-risk sex practice and also identifying the determinants of the high-risk sex practice among the HIV-positive women on HIV care services.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Thika district has a population of about 700,000, and covers an area of 1960.2 square kilometers (Ngugi et al., 2011). The population is both rural and urban and it is highly cosmopolitan. Thika is rich agriculturally and is one of the leading industrial districts in the country. Poverty index is reported at 48.8% (Ngugi et al., 2011), and is on the increase due to factors such as unemployment, collapse of agricultural sectors, poor infrastructure and the rise of HIV/AIDS (Ngugi et al., 2011). According to the NACC (2000), Thika district has been a region of high HIV prevalence with rates of 20-29% for the 15-49 years old. The HIV prevalence rate was 3.8% in 2007 (KAIS, 2007), while in 2011 it rose to 6.4% (Museve et al., 2013).

3.2 Study Setting

This research took place in Thika Level 5 Hospital, at the Comprehensive Care Centre (CCC). Thika Level 5 hospital is a public hospital in Thika District of Kiambu County. The hospital receives patients from within and the surrounding locations. Baseline investigations and ARVs are provided free of charge to all HIV-positive patients. Thika level 5 Hospital was purposely selected for the study. Purposive sampling is where sample is arbitrarily selected because characteristics which they possess are deemed important for the research (Sproul, 1988). This was because the hospital is the largest and with the highest population of PLHIV in Thika district, a district grouped among the areas which have had the highest HIV prevalence rates in the country (NACC/NASCOP, 2000).
3.3 Study Design and Sample Size

The study used a cross-sectional design where a survey was conducted among some of the 2105 HIV-positive women, who had been receiving HIV care-services. This design was used because of its convenience in collecting lots of data from respondents within a short period of time (Mugenda and Mugenda, 2003). The survey was conducted for 30 days from July 2 to July 31, 2014. The individual respondents were randomly selected from a list provided by the CCC management. The selection of the respondents was done systematically with an aid of a list whereby the first woman was picked, two women jumped and the third picked in that order until a sample was obtained from the sampling frame of 2105 HIV positive women attending care at the CCC. A sampling frame is the set of people that has a chance to be selected given the sampling approach that is chosen (Jackson, 2009). The sample size was calculated using a formula for sample size determination, adapted from williamgodden.com (Bill Godden, January 2004). This is as shown below;

\[ n = \frac{z^2 (p.q.D)}{d^2} \]  

\[ \text{(3.1)} \]

Where;

\( n \) = sample size

\( z \) = standard score at 95% level of significance

\( p \) = the proportion of occurrence of the variable of focus (which is 0.5 where the figure is not known)

\( q \) = the proportion of non-occurrence of the variable of focus (which is 1 - p = 0.5)

\( D \) = design effect (which is 1 for an homogenous population)
\[ d = \text{marginal error or confidence interval of } \pm 4\% \ (\pm 0.04) \]

Substituting for the formula;

\[ n = (1.96)^2 \cdot (0.5) \cdot (0.5) \cdot 1 / (0.04)^2 \]

\[ = 600.25 \]

Since the target population was below 50,000, the following formula was used;

New sample size = \[ \frac{n}{1 + \frac{n-1}{\text{Population}}} \]  

\[ (3.2) \]

Therefore, sample size = \[ \frac{600.25}{1 + 600.25 - 1/2105} \]  = 467.23

The study thus sampled 467 respondents but only 422 were interviewed after meeting the inclusion and exclusion criteria.

### 3.4 Study Population

The study population consisted of participants who passed the following inclusion criteria and none of the exclusion criteria.

**Inclusion criteria**

- Age of 18 years and over
- Had been on HIV care services for the last 6 or more months
- Consented to participate
- Able to communicate in Kiswahili or English
Exclusion criteria

- Too physically ill to participate in the survey
- Unwilling to give informed consent to participate
- Mentally ill

The eligible participants were informed about the study by the attending nurse during their regular visits to the center. The participant was then directed to the interviewer who then explained the goals of the study and requested her consent to participate.

3.5 Data Collection

Data was collected through face-to-face interviews with assistance of two trained student nurses using a closed-ended and rating-scale questions interview tool specifically constructed for this study. Face-to-face interview was chosen because it enables the researcher to obtain in-depth data from the respondents as it allows for probing and personal interaction (Mugenda and Mugenda, 2003). This method also allows for clarification of questions to the respondents (Jackson, 2009). The questions were administered in either English or Kiswahili, depending on the respondents’ preference. Interviews were conducted at the CCC in separate rooms in order to protect the privacy of the subjects and the confidentiality of the collected data. Each interview lasted approximately thirty minutes and responses were recorded on the questionnaire.

Data was collected on demographic characteristics, social interaction factors, HIV and safer-sex knowledge factors, health status and contextual factors, and on the psychological factors; as determinants of high-risk sex among the HIV-positive women. The data collection activity continued throughout the 30 days until 467 participants were obtained.
3.6 Variables of Interest and their Measurements

The dependent variable for this study was high-risk sex – that is a measure of unprotected sexual intercourse by the HIV-positive women with either a HIV-negative, or an unknown HIV-status partner(s) in the previous 6 months. This was determined by using the question number 40 in the interview tool: ‘In your last sexual intercourse, was a condom used?’ To get the high-risk sex categorical variable, the sex act was dichotomized into unprotected sex, coded as (1); and protected sex, coded as (0).

The independent or predictor variables were social interaction factors (disclosure, relationship control, and emotional support by family and friends), HIV and safer-sex knowledge factors (ART and condom knowledge, and safe-sex effectiveness), health status and contextual factors (Time on ART, drugs use, and desire for children), and psychological factors (stigma, depression, discrimination). The measures were conducted by using a series of question items modified from the UNAIDS General Population Survey and the Department of Health Services AIDS module (2000), UNHCR-HIV-Behavioural Surveillance Survey in Dadaab Refugee Camps, Kenya (2010), and from studies by Simbayi et al. (2006), Olley et al. (2008), Wagner et al. (2010) and Gerbi et al. (2012).

3.6.1 Demographic factors

The participants were interviewed on a series of items on self. The questions were constructed so that the respondents can report on their age, their highest education level, their partner type (regular or casual or mixed), income level, and whether they were religious or not. By using the participants’ responses on the questions number 35 to 39, the investigator was able to establish the population’s characteristics.
3.6.2 Social interactions factors

The participants answered questions regarding their personal sexual practices and relationships in the prior 6 months. The participants were asked to recall and report whether they had disclosed, and knew their partner(s)’ HIV-status. Using the participants’ responses on questions number 1 to 12, the researcher was able to establish the respondents’ level of emotional support, disclosure, and relationship control.

3.6.3 HIV and Safer-sex knowledge factors

HIV knowledge was assessed using four questions. Responses on these questions was on a five-point scale ranging from 1 (Strongly agree) to 5 (Strongly disagree) and a 3 as “don’t know”. Higher scores indicated lack of information on HIV/ART, and hence a higher risk practice. Safer-sex knowledge was assessed using five items whose responses were similarly on a five-point scale. Higher scores indicated lack of knowledge and lack of safe-sex effectiveness.

3.6.4 Health status and contextual factors

Participants were assessed on the use of three substances (alcohol, marijuana, and khat/miraa). For each drug, participants were asked if they had ever used it in the prior 6 months, and whether they had ever used it with sex. The scale used here was; 1 (YES) and 0 (NO), creating two dichotomous variables of any drug use in the past 6 months and any drug use during sex in the past 6 months. Assessment of health status was judged by the time on ART, self-reported perceived wellness and participants’ desire for children.
3.6.5 Psychological factors

Participant’s level of experience of stigma was assessed using two items. Responses on these questions was on a five-point scale ranging from 1 (strongly agree) to 5 (strongly disagree). Higher scores indicated higher levels of stigma. Discrimination was measured using two questions whose responses were “Yes”, “No” or “don’t know”. Participants who felt discriminated were labeled as those who answered “Yes”. Measurements of depression were based on the two questions as used by Gerbi et al. (2012); “Do you feel depressed, worried, or tired?” and “Do you lose interest in aspects of life that used to be important to you?” The response categories were “Yes”, “No” or “don’t know”. Participants with depression were defined as those who answered “Yes”.

3.7 Data Management

After the interview, the questionnaire was first sight-checked while the respondent was there in order to resolve any anomalies. The data were then entered into a computer Microsoft excel spreadsheet while again being scrutinized for any missing value or miscoding. Any errors detected were corrected whenever possible. The cleaned data were then stored on a computer drive and in a flash disk with access restricted to the investigator.

3.8 Data Analysis

The data analyses for this study were performed using SPSS version 20 (Statistical Package for Social Sciences). Three levels of data analyses; that is descriptive, bivariate, and multivariate, were performed.
3.8.1 Descriptive analyses

Descriptive statistics were used to explore and gain insight into the dataset. The study sample was described by its demographic characteristics and by the main outcome variable. Mean and standard deviation (SD) were computed for the numerical variable and proportions for the categorical variables. The prevalence of high-risk sex (specific objective 1) was estimated based on the participants’ response on whether they had used condoms or not during their last sexual intercourse.

3.8.2 Bivariate analyses

To examine the social interaction, HIV and safer-sex knowledge, health status and contextual and psychological factors’ association with high-risk sex, bivariate logistic analysis for each independent variable was done. This aimed at investigating confounding and providing the initial unadjusted importance of each of the independent variable. Statistical significance of individual regression coefficients (βs) in the bivariate associations between the high-risk sex and the predictor variables, were tested using the Wald Chi-square statistic. All variables that were significant at the p value of < 0.05 level in the bivariate analysis were entered into multivariate logistic regression models.

3.8.3 Multivariate analyses

Logistic regression analyses, a class of generalized linear models, were applied to fit models to the data that emerged significant at the bivariate level of analyses (specific objective 2), and to identify the determinants of high-risk sex (specific objective 3) from the predictor-group variables of social interactions, HIV and safer-sex knowledge, health status and
contextual factors, and the psychological factors. Model reductions were performed based on likelihood ratio test at 5% level of significance.

Logistic regression is well suited for describing and testing hypotheses about relationships between a categorical dichotomous outcome variable and one or more categorical or continuous predictor variables. It assumes that the observations represent a random sample from a population. The method facilitates the determination of variables related to high-risk sex and also to estimate the overall effect of the predictor variables on the outcome variable of the study. Again the method adjusts the effect of the predictor variables in the explaining of the outcome variable at the same time as it enables detection of interaction effect between the predictor variables. The logistic regression model is based on the following logistic-function shown in the mathematical form below (Kleinbaum et al., 2002);

\[
f(y) = \frac{1}{1 + e^{-y}}, \text{ where } y \text{ varies from } -\infty \text{ to } +\infty \]

\[\text{……………………………………… (3.1)}\]

when \( y = -\infty \), the logistic function equals 0.

\[
f(-\infty) = \frac{1}{1 + e^{-(\infty)}} = \frac{1}{1 + e^{\infty}} = 0 \]

\[\text{……………………………………… (3.2)}\]

when \( y = +\infty \); the logistic function equals 1.

\[
f(+\infty) = \frac{1}{1 + e^{-(+\infty)}} = \frac{1}{1 + e^{-\infty}} = 1 \]

\[\text{……………………………………… (3.3)}\]

the range of \( f(y) \) is between 0 and 1, regardless of the value of \( y \)

The fact that the logistic function \( f(y) \) ranges from 0 and 1 is the primary reason that makes logistic model very crucial. The model is designed to describe a probability which is always some number between 0 and 1. To get the logistic model from the logistic function, \( y \) is
written as a linear sum of $\alpha$ plus $\beta_1$ times $X_1$ plus $\beta_2$ times $X_2$, and so on to $\beta_k$ times $X_k$, where the $X$'s are the independent variables of interest and $\alpha$ and $\beta$, are constant terms representing unknown parameters.

$$y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k \ldots \ldots \ldots (3.4)$$

this implies that;

$$f(y) = \frac{1}{1+e^{-y}} = \frac{1}{1+e^{-(\alpha + \sum \beta_i X_i)}} \ldots (3.5)$$

The unknown parameters $\alpha$ and $\beta_i$ are estimated based on data obtained on the X's and on outcome for a group of subjects by using maximum likelihood (ML) method (Agresti, 1996).

Interpretation of results is rendered using the odds ratios (ORs) and their respective 95% confidence intervals (CIs) for both the categorical and continuous predictors. OR is the only measure of association directly estimated from a logistic model without requiring special assumptions. An odd is the ratio of the probability that some event will occur over the probability that the same event will not occur. The odds ratio is a ratio between the odds of two individuals or groups. The models’ calibration was tested using the Hosmer-Lemeshow (HL) goodness-of-fit-test, where statistical significance was set at 0.05. Hosmer-Lemeshow test ($\chi^2_{HL}$) is a Pearson-like chi-square that is computed after data are grouped by having similar predicted probabilities. Large values of $\chi^2_{HL}$ (and small p-values) indicate a lack of fit of the model (Archer et al, 2007).

An alternative way of writing the logistic regression model is by using the logit function; which is the natural logarithm of an odds ratio. A simple logistic model has the general form;
Logit (Y) = ln (π/1-π) = β₀ + βX .................................................. (3.6)

Taking the antilog of the equation on both sides, an equation to predict the probability of the occurrence of the outcome of interest is derived.

π = probability (Y = outcome of interest|X = x, a specific value of X)

= e^{β₀ + βx}/1 + e^{β₀ + βx} .................................................. (3.7)

The natural logarithm transformation of the odds is necessary to make the relationship between a categorical outcome variable and its predictor linear. The value of the coefficient β determines the direction of the relationship between X and the logit of Y;

β > 0, means that there is an increase in the logit of Y for every unit increase in X.

β < 0, means that there is a decrease in the logit of Y for every unit increase in X.

β = 0, means that there is no relationship between the logit of Y and X.

If the predictor variable is continuous, then e^β is the change in risk for every additional measure of the predictor variable, and if the predictor variable is categorical, then the e^β is the odds ratio of one group to the other; one group being taken as the reference.

The logic of the simple logistic regression is extendable to multiple predictors:

Logit (Y) = ln (π/1-π) = β₀ + β₁X₁ + β₂X₂ + ….. + βₖXₖ ........................................ (3.8)

Hence;

π = probability (Y = outcome of interest|X₁ = x₁, .., Xₖ = xₖ)

= e^{β₀ + β₁X₁ + ... + βₖXₖ}/1 + e^{β₀ + β₁X₁ + ... + βₖXₖ} .................................................. (3.9)
Data was entered into the analysis as 0 or 1 coding for the dichotomous outcome, continuous values for the continuous predictors, and dummy coding (0 or 1) for categorical predictors. Within the framework of inferential statistics the null hypothesis states that all $\beta$s = 0. A rejection of this null hypothesis implies that at least one $\beta \neq 0$ in the population, which means that the logistic regression equation predicts the probability of the outcome better than the mean of the dependent variable Y.

### 3.9 Ethical Considerations

During the recruitment process, participants were given an explanation of the purpose, risks and benefits of the study and asked if they would have liked to participate. All the participants were assured of confidentiality and informed consent was secured from each of the participant. Participation was voluntary and no incentives were provided. Clearance for this study was obtained from the Kenyatta University Biomedical Research and Ethical Committee and permission to collect data from the Thika Hospital Management Board/Medical Superintendent.
CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Results

The 467 eligible participants systematically sampled from the population of HIV-positive women undergoing care at Thika level 5 Hospital’s CCC, 442 of them were interviewed after passing the inclusion and exclusion criteria. This was a response rate of 94%. The data has therefore, a high validity in terms of the target population of the HIV-positive women undergoing care at Thika Level 5 Hospital.

4.1.1 Descriptive Analysis

The demographic characteristics and sexual practice of the Study Participants are presented in table 1.

Table 1: Demographic characteristics and sexual practice of the participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>Count (N = 442)</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age groups(years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤25</td>
<td>127</td>
<td>28.7</td>
</tr>
<tr>
<td>26-35</td>
<td>207</td>
<td>46.8</td>
</tr>
<tr>
<td>≥36</td>
<td>108</td>
<td>24.4</td>
</tr>
<tr>
<td>Age(mean±SD)</td>
<td>30.53±6.23</td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;High school</td>
<td>154</td>
<td>34.8</td>
</tr>
<tr>
<td>≥High school</td>
<td>288</td>
<td>65.2</td>
</tr>
<tr>
<td>Religiosity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>41</td>
<td>9.3</td>
</tr>
<tr>
<td>Yes</td>
<td>401</td>
<td>90.7</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10,000</td>
<td>293</td>
<td>66.3</td>
</tr>
<tr>
<td>&gt;10,000</td>
<td>149</td>
<td>33.7</td>
</tr>
<tr>
<td>Partner type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>164</td>
<td>37.1</td>
</tr>
<tr>
<td>Casual</td>
<td>233</td>
<td>52.7</td>
</tr>
<tr>
<td>Mixed</td>
<td>45</td>
<td>10.2</td>
</tr>
<tr>
<td>High-risk sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes (unprotected sex)</td>
<td>174</td>
<td>39.4</td>
</tr>
<tr>
<td>No (protected sex)</td>
<td>268</td>
<td>60.6</td>
</tr>
</tbody>
</table>
As shown in table 1, a total of 442 patients with mean age of 30.53±6.23 (SD) years participated in the study, a big number (46.8%) being in the age group of 26-35. A descriptive analysis of the sample population showed that (174/442) 39.4% of the patients did not use condoms during their last sexual activity; an indicator of a potentially high prevalence of high-risk sexual events. In the issue of couplings, 37.1% had regular partners while 52.7% had casual partners. Mixed sexual partnership represented 10.2% of the total participants. Most reported being religious (90.7%) and had been educated past the high school level (65.2%). Majority (66.3%) were impoverished as they had a monthly income of less than KES 10,000 (US$1 = 85 in 2012).

Table 2: Characteristics of the participants based on the Study variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Counts (N = 442)</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disclosure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>209</td>
<td>47.3%</td>
</tr>
<tr>
<td>Yes</td>
<td>233</td>
<td>52.7%</td>
</tr>
<tr>
<td>Relationship control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>195</td>
<td>44.1%</td>
</tr>
<tr>
<td>Yes</td>
<td>247</td>
<td>55.9%</td>
</tr>
<tr>
<td>Emotional support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>254</td>
<td>57.5%</td>
</tr>
<tr>
<td>Low</td>
<td>188</td>
<td>42.5%</td>
</tr>
<tr>
<td>ART &amp; Condom knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>282</td>
<td>63.8%</td>
</tr>
<tr>
<td>Low</td>
<td>160</td>
<td>36.2%</td>
</tr>
<tr>
<td>Safe sex effectiveness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>296</td>
<td>67.0%</td>
</tr>
<tr>
<td>Low</td>
<td>146</td>
<td>33.0%</td>
</tr>
<tr>
<td>Drugs use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>257</td>
<td>58.1%</td>
</tr>
<tr>
<td>Yes</td>
<td>185</td>
<td>41.9%</td>
</tr>
<tr>
<td>Time on ART(months)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-12</td>
<td>182</td>
<td>41.2%</td>
</tr>
<tr>
<td>13-24</td>
<td>127</td>
<td>28.7%</td>
</tr>
<tr>
<td>Over 24</td>
<td>133</td>
<td>30.1%</td>
</tr>
<tr>
<td>Desire for children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>263</td>
<td>59.5%</td>
</tr>
<tr>
<td>Yes</td>
<td>179</td>
<td>40.5%</td>
</tr>
<tr>
<td>Stigma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>191</td>
<td>43.2%</td>
</tr>
<tr>
<td>Low</td>
<td>251</td>
<td>56.8%</td>
</tr>
<tr>
<td>Discrimination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>204</td>
<td>46.2%</td>
</tr>
<tr>
<td>Yes</td>
<td>238</td>
<td>53.8%</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>211</td>
<td>47.7%</td>
</tr>
<tr>
<td>Yes</td>
<td>231</td>
<td>52.3%</td>
</tr>
</tbody>
</table>
From table 2 above, a large proportion (53.8%) of the study participants reported facing discrimination and almost a similar proportion (52.3%) reported experiencing depression, while 43.2% reported perceiving stigma. Overall 47.3% of the 442 participants reported never disclosing their HIV status to their sex partners while 42.5% reported lack of emotional support. The table also shows that 41.9% of the participants were currently taking intoxicating drugs and 41.2% were on their first year of ART. Child desire was made up of 40.5% of the total study participants and a proportion of 44.1% lacked relationship control.

4.1.2 Bivariate Analyses

Following the descriptive analysis, bivariate logistic regression analyses were performed to assess the association between the study variables and the outcome variable of high-risk sex. It was hypothesized that the social interaction factors, HIV and safer-sex knowledge factors, Health status and contextual factors, and the Psychological factors would be associated with high-risk sex, and hence a series of bivariate analyses were performed on the dependent and independent factors as shown in tables 3-7.

Table 3: Association between demographic factors and High-risk Sex

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Exp(B)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.021</td>
<td>0.016</td>
<td>1.710</td>
<td>0.980</td>
<td>0.191</td>
</tr>
<tr>
<td>Age groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤25 years</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-35 years</td>
<td>0.183</td>
<td>0.203</td>
<td>2.809</td>
<td>1.474</td>
<td>0.246</td>
</tr>
<tr>
<td>≥36 years</td>
<td>-0.228</td>
<td>0.274</td>
<td>0.230</td>
<td>0.427</td>
<td>0.404</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥High school</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;High school</td>
<td>0.388</td>
<td>0.203</td>
<td>3.655</td>
<td>1.474</td>
<td>0.056</td>
</tr>
<tr>
<td>Income (KES)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;10,000</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10,000</td>
<td>0.330</td>
<td>0.209</td>
<td>2.478</td>
<td>1.390</td>
<td>0.115</td>
</tr>
<tr>
<td>Religiosity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>-0.016</td>
<td>0.336</td>
<td>0.002</td>
<td>0.984</td>
<td>0.962</td>
</tr>
</tbody>
</table>
The results of regressing high-risk sex on the demographic factors are that the variable Partner type came out statistically significant at the level of 0.05 in predicting the outcome high-risk sex. The factors Education, Income, Religiosity and Age were not significant (Table 3).

The following table tests the first hypothesis that Social interaction factors (disclosure, relationship control, and emotional support) are associated with high-risk sex among the HIV-positive women on HIV care services.

Table 4: Association between Social interaction factors and High-risk sex

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E</th>
<th>Wald</th>
<th>Exp (B)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disclosure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Ref</td>
<td>0.915</td>
<td>0.2</td>
<td>20.985</td>
<td>2.497</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>0.197</td>
<td>0.017</td>
<td>8.851</td>
<td>1.797</td>
</tr>
<tr>
<td>Relationship control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Ref</td>
<td>0.586</td>
<td>0.017</td>
<td>8.851</td>
<td>1.797</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>0.197</td>
<td>0.017</td>
<td>8.851</td>
<td>1.797</td>
</tr>
<tr>
<td>Emotional support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>Ref</td>
<td>0.193</td>
<td>0.197</td>
<td>0.965</td>
<td>1.213</td>
</tr>
<tr>
<td>Low</td>
<td>No</td>
<td>0.197</td>
<td>0.017</td>
<td>8.851</td>
<td>1.797</td>
</tr>
</tbody>
</table>

Ref = Reference category; Statistical significance set at p < 0.05

As table 4 above shows, the hypothesis was partially supported by the data as the variable Emotional support (β = 0.193, p = 0.326) was not significant at the 0.05 level in predicting high-risk sex. The variables Disclosure (β = 0.915, p <0.001) and Relationship control (β = 0.586, p=0.003) were statistically significant in predicting High-risk sex and were therefore, included in the multivariate logistic regression.
The following table 5 tests the second hypothesis that the HIV and Safer-sex knowledge factors are associated with High-risk sex.

Table 5: Association between HIV & Safer sex knowledge factors and High-risk sex

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E</th>
<th>Wald</th>
<th>Exp (B)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART &amp; condom knowledge</td>
<td>High</td>
<td>-0.374</td>
<td>0.206</td>
<td>3.301</td>
<td>0.069</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safe-sex effectiveness</td>
<td>High</td>
<td>-0.193</td>
<td>0.209</td>
<td>0.857</td>
<td>0.355</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ref = reference category; Statistical significance is set at p < 0.05

As shown in table 5 above, the hypothesis on HIV and Safer-sex knowledge factors being associated with High-risk sex was not supported by the data. Both the variables ART and Condom knowledge ($\beta = -0.374$, p = 0.069) and Safe-sex efficacy ($\beta = -0.193$, p = 0.355) were not statistically significant.

The next table tests the third hypothesis that the Health status and contextual factors are associated with High-risk sex.

Table 6: Association between Health status & contextual factors and High-risk sex

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E</th>
<th>Wald</th>
<th>Exp (B)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs use</td>
<td>No</td>
<td>Ref</td>
<td>0.199</td>
<td>15.615</td>
<td>2.196</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>0.787</td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>Time on ART (months)</td>
<td>0-12</td>
<td>Ref</td>
<td>0.24</td>
<td>7.591</td>
<td>0.516</td>
</tr>
<tr>
<td></td>
<td>13-24</td>
<td>-0.661</td>
<td>0.237</td>
<td>8.562</td>
<td>0.499</td>
</tr>
<tr>
<td></td>
<td>Over 24</td>
<td>-0.695</td>
<td></td>
<td></td>
<td>0.006</td>
</tr>
<tr>
<td>Desire for children</td>
<td>No</td>
<td>Ref</td>
<td>0.199</td>
<td>0.239</td>
<td>0.907</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>-0.097</td>
<td></td>
<td></td>
<td>0.625</td>
</tr>
</tbody>
</table>

Ref = Reference category; Statistical significance is set at p < 0.05
The results in table 6 above supports the third hypothesis partially with the variables Drug use ($\beta = 0.787, p = 0.000$) and Time on ART ($p = 0.003$) emerging significant in predicting High-risk sex. The variable Desire for children ($\beta = -0.097, p = 0.625$) was not significant and was therefore eliminated from further analysis.

The fourth and last hypothesis on the Psychological factors being associated with High-risk sex was tested in the table 7 below.

Table 7: Association between Psychological factors and High-risk sex

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E</th>
<th>Wald</th>
<th>Exp (B)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stigma</td>
<td>High</td>
<td>Ref</td>
<td>0.199</td>
<td>16.471</td>
<td>2.241</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>0.807</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discrimination</td>
<td>No</td>
<td>Ref</td>
<td>0.196</td>
<td>0.707</td>
<td>1.179</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>0.165</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>No</td>
<td>Ref</td>
<td>0.195</td>
<td>0.627</td>
<td>1.167</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>0.155</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ref = Reference category; Statistical significance is set at $p = 0.05$

The results show that the fourth hypothesis was also fairly partially supported by the data. Only the variable Stigma ($\beta = 0.807, p < 0.001$) significantly predicted the outcome High-risk sex, and was hence included in the multivariate logistic regression analysis.

4.1.3 Multivariate Analysis

(a). Multivariate analysis for factors associated with High-risk sex without interactions

Having performed bivariate analyses, those variables significant at $p < 0.05$ in predicting high-risk sex were included in the multivariate logistic regression analysis while those not significant were eliminated from further analysis. The variables that emerged significant included: Disclosure of HIV status, Relationship control, Drugs use, Time on ART, Stigma,
and one of the demographic factors (Partner type). Model reduction was done by backward likelihood ratio method at 0.05 level of significance.

Initial analysis of the logistic regression gave an overall success rate of classifying those who engaged in high-risk sex and those who never to be 60.6%. Those observed to engage in high-risk sex were 174 (39.4%) whereas those who engaged in no high-risk sex were 268 (60.6%). Having eliminated the variables Relationship control and Drugs use which were not significant, the Omnibus test’s block Chi-square of 91.823 (p < 0.001) at 6 degrees of freedom (df) tells us that the remaining variables have effects that differ from zero. The model’s Chi-square of 91.823 (p < 0.001) and 5 df indicates that at least one of the variables remaining in the model differ from zero.

From the logistic regression analysis results, each of the variables Time on ART, Stigma, and Partner type’s change in -2 Log likelihood was significant at 0.05 level except for the variable Disclosure (p = 0.075). This indicates that the model with the predictors is significantly different from the one with the constant only (all ‘b’ coefficients being zero). The model summary indicates that the elimination of the non-significant variables led the -2 Log likelihood increasing to 500.774 from 499.169. This increase in the -2 Log likelihood shows the non-significant contribution of the eliminated variables in the model.

The Hosmer and Lemeshow Test showed that there is a linear relationship between the predictor variables (Disclosure, Time on ART, Stigma, and Partner type) and the log odds of criterion variable (high-risk sex) as the Chi-square change (2.616) with 8 df was not significant (p = 0.956). Lastly, the model’s classification table gave an overall percentage for correct prediction as 70.4%, which is better compared to that of the null model (60.6%). Out of the 174 participants observed to have engaged in High-risk sex, 108 were correctly
predicted to have engaged in the High-risk sex while out of 268 participants observed not to have engaged in High-risk sex, 203 were correctly predicted.

The following table shows the logistic regression coefficient, Wald test, odds ratio and odds ratio’s confidence intervals for each of the predictors.

Table 8: Logistic Regression Model without Interaction Terms

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>Wald χ²</th>
<th>p-value</th>
<th>OR</th>
<th>95% CI for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Disclosure</td>
<td>0.436</td>
<td>3.189</td>
<td>0.074</td>
<td>1.546</td>
<td>0.958</td>
</tr>
<tr>
<td>Time on ART (months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-12</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-24</td>
<td>-0.702</td>
<td>7.076</td>
<td>0.008</td>
<td>0.496</td>
<td>0.295</td>
</tr>
<tr>
<td>Over 24</td>
<td>-0.194</td>
<td>0.506</td>
<td>0.477</td>
<td>0.823</td>
<td>0.482</td>
</tr>
<tr>
<td>Stigma</td>
<td>0.450</td>
<td>3.839</td>
<td>0.050</td>
<td>1.569</td>
<td>1.000</td>
</tr>
<tr>
<td>Partner type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casual</td>
<td>1.865</td>
<td>48.252</td>
<td>0.000</td>
<td>6.453</td>
<td>3.813</td>
</tr>
<tr>
<td>Mixed</td>
<td>1.357</td>
<td>11.199</td>
<td>0.001</td>
<td>3.884</td>
<td>1.755</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.834</td>
<td>38.746</td>
<td>0.000</td>
<td>0.160</td>
<td></td>
</tr>
</tbody>
</table>

Ref = reference category

As shown in table 8, employing a 0.05 criterion of statistical significance, Stigma, one of the Time on ART dummy variables, and two of the Partner type dummy variables had significant partial effects. The odds ratio for Disclosure indicates that when holding all other variables constant, a participant who did not disclose was 1.55 times more likely to engage in high-risk sex than a participant who disclosed her HIV status (AOR 1.55; 95% CI: 0.96 – 2.50). For the variable Time on ART, those participants who had used ARVs for 13-24 months were 0.50 times more likely to practice High-risk sex than those who had used ARVs for 0-12 months only (AOR 0.50; 95% CI: 0.30 – 0.83) while those participants who had been on ART for more than 24 months were 0.82 more times to engage in High-risk sex than those
who had been on ART for 0-12 months (AOR 0.82; 95% CI: 0.48 – 1.41). The table also shows that those participants who perceived stigma were 1.57 times likely to practice High-risk sex than their counterparts who perceived low or no stigma at all (AOR 1.57; 95% CI: 1.00 – 2.46). While holding the other variables constant, those participants with casual partners were 6 times more likely to engage in High-risk sex than those who had regular sex partners (AOR 6.45; 95% CI: 3.81 – 10.92) while those participants with mixed sex partners were 4 times more likely to engage in High-risk sex than their counterparts with regular sex partners (AOR 3.88; 95% CI: 1.76 – 8.60).

(b). Multivariate analysis for factors associated with High-risk sex with interactions

In order to test for interaction term model a further logistic analysis was performed by including in the logistic regression the interaction terms of Relationship control*Disclosure, Relationship control*Drugs use, Relationship control*Stigma, Disclosure*Drugs use, Time on ART*Disclosure, Stigma*Disclosure, Stigma*Drugs use, and Disclosure*Partner type. Model reduction was again done through backward likelihood ratio test at significance level of 0.05. The resultant model is as shown in the table 9 below.

The Omnibus Test shows that the effects of the interaction variables significantly differ from zero ($p < 0.001$) and the model Chi-square of 91.712 ($p < 0.001$) with 5 df tells us that at least one of the variables in the model differs from zero. The -2 Log-likelihood changes for each of the variables remaining in the model were significant at 0.05 level. The elimination of non-significant variables led the -2 Log-likelihood statistic increasing to 500.886 from 493.433 in the full model.
The Hosmer and Lemeshow test gave a Chi-square of 3.560 (p = 0.829) with 7 df that indicates a linear relationship between the model’s predictor variables and the log-odds of high-risk sex. The final model gives 69.0% correct predictions for high-risk sex compared to 60.6% for the null model. Out of the 174 participants observed to have engaged in high-risk sex, 118 were correctly predicted.

Table 9: Logistic Regression Model Involving the Interaction Terms

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>Wald χ²</th>
<th>p-value</th>
<th>OR</th>
<th>95% CI for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casual</td>
<td>1.885</td>
<td>49.838</td>
<td>0.000</td>
<td>6.587</td>
<td>3.903-11.118</td>
</tr>
<tr>
<td>Mixed</td>
<td>1.484</td>
<td>14.845</td>
<td>0.000</td>
<td>4.411</td>
<td>2.073-9.385</td>
</tr>
<tr>
<td>Time on ART (months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-12</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-24</td>
<td>-0.728</td>
<td>7.642</td>
<td>0.006</td>
<td>0.483</td>
<td>0.288-0.809</td>
</tr>
<tr>
<td>Over 24</td>
<td>-0.222</td>
<td>0.673</td>
<td>0.412</td>
<td>0.801</td>
<td>0.471-1.361</td>
</tr>
<tr>
<td>Stigma*Disclosure</td>
<td>0.738</td>
<td>9.146</td>
<td>0.002</td>
<td>2.091</td>
<td>1.296-3.373</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.640</td>
<td>37.214</td>
<td>0.000</td>
<td>0.194</td>
<td></td>
</tr>
</tbody>
</table>

Ref = reference category

From table 9 above it can be seen that while holding other predictor variables constant, the participants with casual sex partners were 7 times more likely to practice High-risk sex than those with regular sex partners (AOR 6.59; 95% CI: 3.903-11.12) while those with mixed sex partners were 4 times more likely than those with regular partners to engage in High-risk sex (AOR 4.41; 95% CI: 2.07-9.39). Likewise, on the variable Time on ART it can be seen that those participants who were on ART for 13-24 months were 0.5 times more likely to engage in High-risk sex than those on ART for less than a year (AOR 0.48; 95% CI: 0.29-0.81) while those on ARVs for over 2 years were 0.8 times more likely to engage in High-risk sex compared to those on ART for less than a year (AOR 0.80; 95% CI: 0.47-1.36). A
combination of non-disclosure and stigma led participants to High-risk sex practice 2 times more than their counterpart (AOR 2.09; 95% CI: 1.30-3.37).

(c). Comparison of main effects model and the interaction term model

As seen from tables 8 and 9 above, the predictor variable Disclosure that had a significance of p = 0.074 in the main effects model was not significant in the interaction effects model hence its elimination as a stand-alone variable but remained statistically significant while in interaction with the variable Stigma (β = 0.74, p = 0.002). The predictor variables Partner type and Time on ART were all significant in the interaction effects model just as they were in the main effects model. The variable Stigma (β = 0.45, p = 1.57) was significant in the main effects model but not in the interaction term model.

Table 10: Main effects model compared with Interaction effects model

<table>
<thead>
<tr>
<th>Model</th>
<th>Omnibus Test</th>
<th>Model summary</th>
<th>H-L Test</th>
<th>Classification Table</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model Chi-square</td>
<td>Sig.</td>
<td>-2 Log Likelihood</td>
<td>Nagelkerke R²</td>
</tr>
<tr>
<td>Main effects model</td>
<td>91.823</td>
<td>p&lt;0.001</td>
<td>500.774</td>
<td>0.254</td>
</tr>
<tr>
<td>Interaction effects model</td>
<td>91.712</td>
<td>p&lt;0.001</td>
<td>500.886</td>
<td>0.254</td>
</tr>
</tbody>
</table>

As shown in table 10 above, the interaction effects model summary gave a -2 Log likelihood (500.886) that was the same as that one of the main effects model (500.774) and exactly the same R-squares (Nagelkerke R-square = 0.254). These show that the model with interaction variables makes a similar fit and explains variation just like the main effects model. The Hosmer-Lemeshow (HL) Test Chi-square of 3.560 (p=0.829) indicate a linear relationship.
between the predictor variables in the model and the log odds of the criterion variable High-risk sex; though not as strong as in the main effects model where the HL test gave a Chi-square of 2.616 (p=0.956). The overall percentage for correct prediction is 69.0% compared to 70.4% in the main effects model, but the interaction term model has a higher sensitivity (67.8%) compared to the main effects model (62.1%).

The study’s logistic regression model therefore contains the predictor variables: Partner type, Time on ART (months), and Stigma*Disclosure. These variables’ -2 Log likelihood changes were all significant at the 0.05 level.

4.2 Discussion
In this study the sexual practices and related factors among HIV-positive women undergoing HIV care services were analyzed. The results indicated that there is a high level of HIV transmission from these women to their at-risk men and/or increased chances for HIV re-infection from their sexual partners. The descriptive analysis showed that 39.4% of the participants reported not to have used condoms during their last sexual intercourse, an indicator of a potentially high prevalence of high-risk sexual events (specific objective 1). This finding corroborates with a study in Ghana (Ncube et al., 2012). The study sample was highly representative of the population due to the high response rate (94%) and hence provides insights into the risky sexual practices of the HIV-positive women in Thika, Kenya. The vast majority of the respondents was of the age-group 26-35 years (46.8%), earned low income (66.3%) and were in a casual sex relationship (52.7%).

The study tested four hypotheses relating predictors of high-risk sex (HRS) practice by the HIV-positive women undergoing care. The results partially supported the hypothesis that social interaction factors (disclosure of HIV status, relationship control, and emotional
support) were associated with high-risk sex. In the bivariate logistic regression analyses where significance level was set at 0.05, the group’s variables Disclosure and Relationship control were statistically significantly associated with the outcome variable of high-risk sex. In the multivariate logistic regression analyses, only the variable Disclosure (p=0.074) was retained by the regression in the main effects model while in interaction term model Disclosure was significant when in combination with Stigma. It was found out that participants who reported non-disclosure of their HIV status during the six months prior to the study were more likely to engage in high-risk sex (β = 0.915, p < 0.000). This outcome supports the studies by Beyeza et al. (2009) and Kabiru et al. (2010). The bivariate analyses also showed that, the participants who had no relationship control (β = 0.586, p = 0.003) were more likely than those with relationship control to engage in high-risk sexual activity.

Lack of relationship control has also been associated with inconsistent condom use in another study by Pettifor et al. (2004) where it was found that the women who had low relationship control were 2.1 times more likely to use condoms inconsistently (95% CI: 1.17-3.78). Such lack of individual decision making power in intimate relationships may be due to social pressure to conceive a child. In African societies reproductive expectations play a big role hence the woman may experience the pressure to bring forth children. Non-disclosure may occur due to fear of being rejected or being discriminated against. The patients may also feel ashamed and hence the reason to maintain secrecy (Kumar et al., 2007; Mlambo et al., 2011). Trading sex for money can also make the patients fail to disclose as they might be afraid of losing market. This can happen due to the need for survival as a big number (66.3%) of the participants earned less than KES 10,000 per month and therefore this may have increased the likelihood of achieving the present situation of results. The results suggest
a need for interventions that can offer social care and support to the patients’ socio-economic conditions.

The second hypothesis that stated that HIV and Safe-sex knowledge factors were associated with high-risk sex was not supported by the data. The variables ART and Condom knowledge ($\beta = -0.374$, $p = 0.069$) and Safe-sex knowledge ($\beta = -0.193$, $p = 0.355$) were not significant in the bivariate analyses.

The third hypothesis stated that Health status and Contextual factors (Time on ART, Drugs use, and Desire for children) were associated with high-risk sex. This hypothesis was partially supported by the data as the variables Time on ART ($p = 0.003$) and Drugs use ($p < 0.001$) came out statistically significant as predictors of high-risk sex in the bivariate analyses. In the multivariate analysis with interaction, only Time on ART remained significant. The study shows that those participants who were in ART for 13-24 months were 0.5 times more likely to engage in high-risk sex than those who had been taking ARVs for less than a year (AOR 0.48; 95% CI: 0.29 – 0.81) while those who were on ART for over 2 years were 0.8 times more likely to practice high-risk sex than those on ART for less than a year (AOR 0.80; 95% CI: 0.47 – 1.36). These indicate a relationship between Time on ART and High-risk sex with a trend showing more high-risk sex activity among participants who have been using ARVs for long. This finding supports that of other studies like Sarna et al. (2004), McGowan et al. (2004) and Olley (2008). The increased High-risk sex among the participants could have been reflections of perceived good health that may contribute to the misconception that HIV transmission are eliminated. It could also be due to a waning of emotional support for risk behavior modification over time leading to difficulties sustaining safer sex practices. The patients should be counseled and made to understand the risk of
transmitting HIV and exposing themselves to secondary infections that may be hard to manage. The patients should be educated on how to apply risk-reduction methods.

Lastly, the investigator had hypothesized that Psychological factors (stigma, depression and discrimination) were associated with the high-risk sex. This hypothesis was also partially supported by the study data. The variable stigma was statistically significant in both the bivariate analysis ($\beta = 0.807, p < 0.001$) and in the main effects multivariate logistic regression model ($\beta = 0.450, p = 0.05$). In the multivariate logistic regression with the interaction effects variables, those participants who perceived stigma and faced non-disclosure of HIV status were 2 times more likely to engage in high-risk sex as compared to those who did not perceive being stigmatized and did disclose (AOR 2.09; 95% CI; 1.30 – 3.37). In consistency to these findings, Dessie et al.(2011) in Ethiopia found out that 49.1% of the participants who had perceived stigma in the 3 months prior to the study were more likely to have engaged in unprotected sex ($p = 0.01$) than those who had not. The negative experiences can lead to non-disclosure (Reilly et al., 2009). Stigma can lead to low self-esteem that can then lead to drug abuse. Stigma can also lead to difficulties in negotiating for safer sex and hence increase in risk-behaviour (Folch et al., 2009). Low education (34.8%) among the participants could have been a strong contributory factor to stigma.

Lastly but not the least, partner type was a major contributor to high-risk sex. Participants with casual and mixed sex partners were found to be more likely to practice High-risk sex than those with regular sex partners. These findings are in consistency with that of a study by Latka et al. (2006). This can be due to lack of sense of protection or the partner not supporting safe-sex. Engaging in sex trade can also be a contributing factor to the high-risk
sex among the casual and mixed partnership as the participant may be afraid of losing market.

4.2.1 Limitations of Study

The study encountered a number of limitations. First, the study relied on patients’ recall and self-reports that may be subject to bias. Possible lack of recall or disclosure may mean that the actual high-risk sex practice could be higher; hence a potential under estimation. But, to increase the participants’ trust and reduce the biasness, the respondents were assured of the data confidentiality and the interviews were conducted in privacy.

Second, the cross-sectional design of this study makes it hard to determine the causality direction. It cannot accurately be concluded whether the various proposed factors were predictive rather than reflective of a participant’s sexual practice. This can be overcome by using a prospective study that would enroll participants and then follow them for a certain period of time. This would allow adequate assessment of the causal and temporal relationship between the various independent variables and the high-risk sex dependent variable. In this case one would be able to answer the question whether the hypothesized independent variables truly preceded the outcome variable.

Lastly, the study was done at one setting. The findings therefore, may not be representative of HIV-positive women in other areas of Kenya. A study involving several areas for data collection would be more suitable.
CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

High-risk sex is very prevalent among the HIV positive women undergoing HIV care services. The study found out that 39% of the total respondents did not use condoms during their last sexual activity (specific objective 1). Generally, the study failed to reject the four hypotheses being tested, although some individual variables in the groups’ categories came out statistically significant in predicting the outcome variable high-risk sex in the bivariate analyses. Those statistically significant individual variables included the variable disclosure of HIV status, relationship control, time on ART, drugs use, and stigma. The HIV-positive women who never disclosed their HIV status, those with low relationship control, those who had been on ART for over a year, those taking drugs, those who were experiencing stigma, and those with casual and mixed sexual partners were found to be more likely to practice high-risk sex (specific objective 2). In the multivariate analysis, the predictor variables Time on ART, Partner type, and the interactions term Disclosure*Stigma remained as the main determinants of High-risk sex among the HIV-positive women on HIV care services (specific objective 3) as they increased the likelihood that the HIV-positive women had engaged in the high-risk sex practice.

In as much as the results are consistent with those from other similar studies, there should be caution in interpreting the results of this study because of the inherent methodological limitations. We relied mainly on self-reports that are bias susceptible like in the case of the high-risk sex practice; though we tried to lessen this by only considering the most recent
instance of sexual intercourse which is more likely for the respondents to recall. Also basing our decision for high-risk sex on the last sexual encounter had the benefit of getting an idea on the true distribution of the sample population’s sexual practice. These findings are derived from a one setting sample of HIV-positive women and therefore generalizing the findings cannot be done with certainty. The data are also cross-sectional and therefore, temporal order and relationships cannot be justifiably established. That notwithstanding, the results suggest that high-risk sex is prevalent among the HIV-positive women receiving care in Thika, Kenya, and may reflect similar situations all over the country. The results therefore, underscore the need for continuous evaluation of high-risk sex practices among the HIV-positive women undergoing care.

5.2 Recommendations

Due to the cross-sectional design of the study and the one instance results, a prospective study is needed to address the temporal relationship between the determinants of the high-risk sex and the outcome High-risk sex variable. A study to determine how the patterns of disclosure are (who told who or who did not tell who) associated with high-risk sex is also needed.

There seems to be a misunderstanding that the moment you are on the ART program and that you are feeling healthy you do not need condoms. Patients should be cautioned that ART and the resultant good health is not a guarantee against virus transmission. A rigorous intervention to promote safer sex practices is needed to address this inherent problem among HIV patients. The patients should be counseled and encouraged to accept their condition of living with the HIV virus whether the load is undetectable or not and to avoid transferring it to others. This can be achieved by training the HIV-positive women on how to cope with
negative experiences and how to increase their skills in negotiating safer-sex practices, controlling sexual situations and communicating effectively with their partners. A better way is by incorporating prevention information and interventions into the standard medical care for the HIV-positive women.

Last and most importantly, the government and the donor community should provide resources to help reinforce safe sex practices and set up infrastructure for improving the socio-economic conditions of the PLHIV.
REFERENCES


Appendix I: Interview Tool

Section A: Social Interactions

Q1. Do you have a regular partner?
   1. Yes       2. No

Q2. Do you know the HIV status of your regular partner?
   1. Yes       2. No

Q3. Does your regular partner know your HIV status?
   1. Yes       2. No       3. Don’t know

Q4. Does your regular partner support condom use?
   1. Yes       2. No

Q5. In the last 6 months, have you had other sex partners (casual)?
   1. Yes       2. No

Q6. Did you tell your new partner that you had HIV?
   1. Yes       2. No

Q7. In your sexual encounters with the new partners, how often did you use a condom?

Q8. During sex, it is up to the partner to use a condom or not
1. Yes  
2. No

Q9. It is really hard to bring up the issue of condoms to my partner;

1. Yes  
2. No

Q10. I would be afraid to suggest using condoms with a new partner because he might think that I have an STD.

1. Yes  
2. No

Q11. Do community members encourage you in life with your condition?

1. Yes  
2. No

Q12. Do community members take you as a person as their used to take you before?

1. Yes  
2. No

Section B: HIV and Safe-sex Knowledge

Q13. I have been taking ARVs; hence I cannot transmit HIV;

1. Strongly agree  
2. Agree  
3. Don’t know  
4. Disagree  
5. Strongly disagree

Q14. Getting infected with another strain of HIV would cause little additional harm to my health;

1. Strongly disagree  
2. Disagree  
3. Don’t know  
4. Agree  
5. Strongly agree.

Q15. It would be more difficult to treat my HIV disease if I got another stain of HIV;
Q16. As a result of using ART and my viral load is very low, I do not need to be concerned about having sex with my partner without a condom;


Q17. Condoms are an effective method for preventing the spread of HIV and other STIs;


Q18. Condoms are unreliable;


Q19. Condoms ruin the sex act;


Q20. Latex and natural skin condoms protect equally well against the AID virus;


Q21. Do you know how to fit and remove condom from your partner or yourself during sex?

1. Yes  2. No  3. Don’t know
Section C: Health status and Contextual factors

Q22. In the past 6 months, have you had drinks containing alcohol?

1. Yes 2. No

Q23. If yes, have you had an alcoholic drink while about to do sex?

1. Yes 2. No

Q24. In the past 6 months, have you smoked bhang or chewed khat/miraa?

1. Yes 2. No

Q25. If yes, have you smoked bhang or chewed miraa while about to do sex?

1. Yes 2. No

Q26. For how long have you been receiving antiretroviral therapy? Time in months.


Q27. Do you feel strong and healthy now?

1. Yes 2. No

Q28. Are you considering becoming pregnant?

1. Yes 2. No

Section D: Psychological factors

Q29. If I told my regular partner that I have HIV, he would leave me;

Q30. Telling someone I have HIV is risky;


Q31. Have you experienced discrimination because of HIV status?

1. Yes  2. No  3. Don’t know

Q32. Have you been treated differently after disclosing HIV status to someone?

1. Yes  2. No  3. Don’t know

Q33. Do you feel depressed, worried, or tired?

1. Yes  2. No  3. Don’t know

Q34. Do you lose interest in aspects of life that used to be important to you?

1. Yes  2. No  3. Don’t know

**Section E: Demographic characteristics & High-risk sex practice**

Q35. How old are you now?

.............................. years

Q36. What is your highest level of education?

1. Primary  2. Secondary  3. College

Q37. How can you classify your monthly income?
1. <10,000  
2. >10,000

Q38. Do you often pray/worship?

1. Yes  
2. No

Q39. How can you classify your sex partner(s)?

1. Regular  
2. Casual  
3. Mixed

Q40. In your last sexual intercourse was a condom used?

1. Yes  
2. No  
3. Don’t know

END