Sexual risk behaviour among people on antiretroviral therapy in Kisarawe district: assessment of magnitude and associated factors

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SEXUAL RISK BEHAVIOUR AMONG PEOPLE ON ANTIRETROVIRAL THERAPY IN KISARAWE DISTRICT: ASSESSMENT OF MAGNITUDE AND ASSOCIATED FACTORS

By

Isihaka Hamidu

A Dissertation Submitted in (Partial) Fulfillment of the Requirement for the Degree of Master of Public Health of

Muhimbili University of Health and Allied Sciences
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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the Muhimbili University of Health and Allied Sciences a dissertation entitled: "***Sexual Risk Behaviour Among People on Antiretroviral Therapy in Kisarawe District: Assessment of Magnitude and Associated Factors"***, in (partial) fulfillment of the requirements for the degree of Master of Public Health of the Muhimbili University of Health and Allied Sciences.

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Dr. Tumaini Nyamhanga

(Supervisor)

_____

Date

DECLARATION AND COPYRIGHT

I, **Isihaka Hamidu**, declare that, this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature…….. **Date** …….

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DEDICATION

I would like to dedicate this research work to my lovely parents, my wife and children for their support to the entire time period of my MPH course.

ABSTRACT

Background

HIV transmission continues at high rates among ART patients and to uninfected persons. There is limited clear research evidence on the prevalence of high risk sexual behavior and associated factors in Tanzania. It is this gap in knowledge that this study intended to fill.

Objective: The aim of this study was to assess the prevalence and factors associated with risky sexual behavior among people living with HIV on ART in Kisarawe District.

Methodology: This study employed a cross sectional design. The study was conducted in Kisarawe District, among a random sample of People living with HIV on ART. Descriptive statistics were employed in analyzing the data collected. Chi square was to assess relationship between variables. The Logistic regression was use to assess the factors that were associated with dependent variables.

Results: A total of 400 HIV positive patients on ART participated in the study, 47% of the patients were male and 53% of female, with the mean age of 37.2 (SD 8.3) years. Among 323 respondents who were sexually active, 162 (50.2%) engaged in high sexual behavior(did not use condom consistently in the past 6 months preceding the study). Out of these inconsistent condom users, 94 (58.1%) were females.

Conclusion: High prevalence of high risk sexual behavior among HIV patients on ART is a matter of public health concern. This has implications for re-examining HIV prevention strategies.

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
ARVs	Antiretroviral Viruses
CTC	Care and Treatment Clinic
DHS	Demographic and Health Survey
HIV	Human Immunodeficiency Syndrome
MoHCDGEC	Ministry of Health Community Development Gender Eldery & Children
MPH	Master of Public Health
MUHAS	Muhimbili University of Health and Allied Sciences
PLHIV	People Living with HIV
SPSS	Statistical Package for the Social Sciences TDHS Tanzania Demographic Health Survey WHO World Health Organization

DEFINITION OF KEY TERMS

Risky sexual behaviors: defined as behaviors that increase one's risk of contracting sexually transmitted infections and experiencing unintended pregnancies. These include having multiple sexual partners, having sex while under the influence of alcohol or drugs, and inconsistent condom use.

Sexual behavior: Participants indicated the number of males and/or females with whom they had sex in the past three months. Previous studies have shown that participant reports of sexual activity and condom use are more reliable for 3- and 6-month retrospective recall periods than for 12-month recall periods (Jaccard et al. 2002).

Antiretroviral therapy (ART): A treatment of people infected with human immunodeficiency virus (HIV) using anti-HIV drugs (WHO)

Inconsistent condom use: Irregular use or none use of a condom during sexual intercourse encounters (Animaw, 2009).

Unprotected sex: to mean either sexual activity without the use of a condom or inconsistent condom use with any partner irrespective of HIV sero-status (Berhan et al).

High risky sexual behavior: Non condom use during sexual intercourse

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Problem

HIV transmission continues at high rates among ART patients and to uninfected persons. An estimated 46% of new HIV infections globally in 2015 where 25.5 million people living with HIV live in sub-Saharan Africa that estimated 70% of all people living with HIV. The vast majority of them (an estimated 19 million) live in east and southern Africa and in the same year 1.4 million people were living with HIV in Tanzania. This equates to an estimated HIV prevalence of 4.7%.1 , almost 36,000 people died from an AIDS-related illness and a total of 688,600 adults were receiving ART in Tanzania. Antiretroviral therapy (ART) has reduced mortal-ity and morbidity from HIV disease, improving the wellbeing of many people living with HIV, and has enabled many HIV-infected persons to live a longer and healthier life. Yet if they have sex without a condom, those with higher viral load or low CD4 count before or at the initiation of ART have the potential to infect a sero-negative sexual partner or may themselves be at risk of acquiring drug-resistant viral strains from a sexual partner who is already infected. (1).

Improvements in health and life expectancy of HIV-infected people may lead to a belief that HIV is no longer a serious and deadly disease. ART significantly reduces patients' viral loads, often to undetectable levels, which may lead to the perception that they are no longer infectious. People living with HIV who receive ART are raising the risk of HIV transmission to their sexual partners. Several research studies a reduction in sexual risk behavior after initiating ART. At the same time, other research studies have shown that PLHIV accessing ART have continued to practice unprotected sexual intercourse and increasing number of partners, even though have exposed to prevention massages.

People may experience 'safer sex burnout' as they have difficulty sustaining safer sexual behavior over a lifetime. In addition, ART significantly improves physical health and quality of life, which may enable or encourage individuals to resume sexual activity,

including unsafe sex. (2). As HAART significantly reduces plasma HIV RNA levels and improves physical health, HIV-infected individuals may engage in unsafe sex (Dukers 2001; Kelly 1998; Ostrow 2002; Stolte 2004). (3).

Consequently, such high-risk behaviors create a new public health threat through ongoing transmission of the HIV virus and possible transmission of HIV viral strains that have already acquired genetic resistance to existing therapies (4) (Kaye et al. 2012).

In systematic review, most studies did not reveal statistically significant increase in high-risk behavior in HAART-taking patients compared to patients not taking HAART. Considering that many sexually active patients reported HIV-related risky sexual behaviors such as unprotected sex with persons of unknown HIV status, non-use of condoms, nondisclosure of HIV status, fertility desires and multiple and often concurrent sexual partnerships, that findings raised several concerns. Heterosexual intercourse is the main mode of transmission of HIV in sub-Saharan Africa. The fact that HAART-taking patients may manifest high-risk behavior [22] is strengthened by the finding in this study that patients with less advanced infection reported unsafe sex more often than those with severe symptoms.(4)

The research conducted in India found that, both the developed and developing world, increased access to highly active antiretroviral therapy (HAART) has extended life and reduced morbidity and mortality((5) ; (3)), and has enabled HIV- infected individuals to resume behaviors, including sexual activity (6).

The early use of ART provides PLHIV another tool to reduce the risk that they will transmit HIV to their sexual partners. However, although the risk of HIV transmission with consistent ART use is low, it is not zero and data from the HIV treatment and care cascades in many countries indicate that a substantial number of PLHIV who need ART are not receiving ART and that less than 50% of PLHIV engaged in care achieve undetectable HIV viral loads. Thus, behavioral and other risk- reduction interventions such as Prevention with Positives (PwP) remain important tools to prevent HIV transmission(7)

PwP interventions encourage PLHIV to take steps to maintain and improve their health, to Prevent transmission of HIV and other sexually transmitted infections (STIs) to sexual partners, and to prevent unintended pregnancies to limit HIV transmission from HIV-infected mothers to their new-born infants [8] while allowing full and satisfying emotional and sexual relationships [8–12]. (7).

Prevention interventions for PLHIV integrated into facility and community-based ART programs can dramatically reduce sexual transmission of HIV and effectively engage PLHIV as equal partners in efforts to curb the HIV epidemic [4]. Evidence-based prevention interventions for PLHIV include: adherence counseling and support, risk reduction counseling and condom provision, partner HIV testing and counseling, family planning counseling and services, and STI treatment and management [5]. (8)

Therefore, due to the conflicting finding where one group of findings suggests positive impact and another negative impact of ART in resuming sexual risk behavior among ART patients. These inconsistent results in the decade of provision of ART call further country specific studies to find out sexual behavior among PLHIV receiving ART. Specifically, there is limited clear research evidence on the prevalence of high risk sexual behavior and associated factors in Tanzania. It is this gap in knowledge that this study intended to fill. Therefore, this research study has assessed the prevalence, magnitude and associated factors of sexual risk behaviors among PLHIV on ART which can provide useful insights to guide efforts in preventing further HIV transmission. This study mainly focused on condom use, multiple partners and sex while drunk, but other studies defined condom use and multiple partners as the most commonly used markers of risk behavior (Johnson et al. 2006). It also helps to enable PLHIV to live healthy and minimize the risks of spreading the HIV to others.

1.2 Statement of the Problem

Scale-up of ART in Tanzania has contributed to improved quality of life and stigma reduction among PLHIV on ART. Kaye et al (2013) found that HAART has reduced mortality and morbidity from HIV infection and thus improved the well-being of many people living with HIV. Using ART in treatment and care for people living with HIV (PLHIV) has resulted in many people extending life with HIV viruses. On the other hand, the well-being among ART patients had an influence on HIV infection behaviors which cause unprotected sexual intercourse. However, the impact of ART on high sexual risk behavior is not clearly understood. Previous studies (Crepaz et al. 2004) indicated that, ART has partly resulted into unintended engagement in high risk sexual behavior. On the other hand, other studies (Sama 2008; Kaye 2003) reported that HAART was not associated with high risk sexual behavior.

These inconsistent results in the decade of provision of ART call for further country specific studies to understand sexual behavior of the ART clients. Specifically, there is limited clear research evidence on the magnitude of high risk sexual behavior and associated factors in Tanzania. It is this gap in knowledge that this study intended to fill.

1.3 Significance of the Study

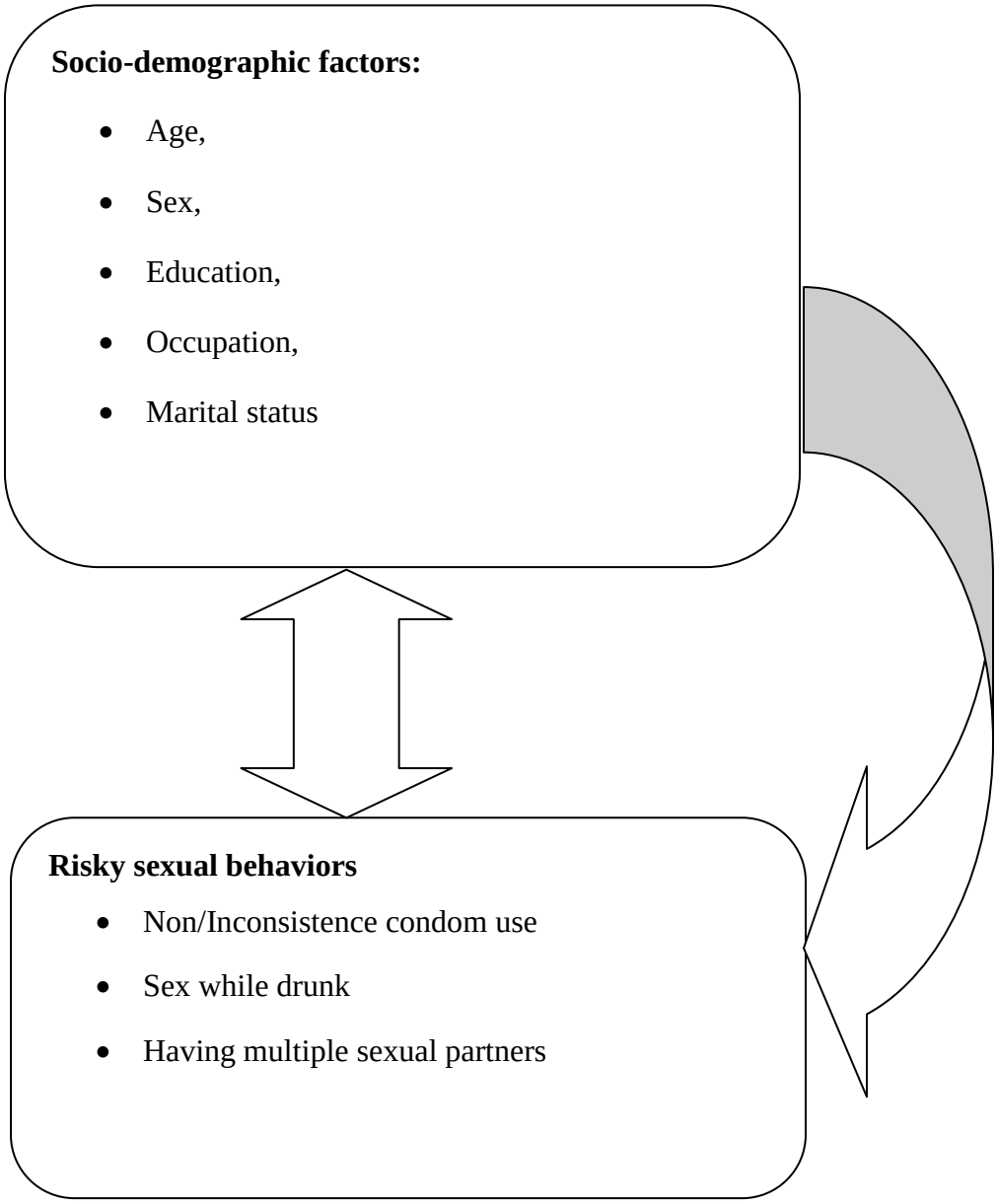
The results of this study are informing development of interventions targeting sexual behavior of PLHIV with aim of protecting and make them to live healthily and minimize the risks of their spreading the virus to others. In addition, the study is contributing to the body of literature on high sexual risk behaviors among PLHIV on ART.

1.4 Conceptual Framework

The conceptual framework (**figure 1**) illustrates the association of variables with risky sexual behavior among patient on ART. The framework postulates that ART use may influence risky sexual behaviors among PLHIV on ART, as it improves physical health and psychological wellbeing of clients. In addition, background characteristics such as age, sex, education, occupation and marital status may also have an influence on high risk sexual behavior. Finally, engagement in high risk sexual behavior, results into increased rate of new HIV infection among ART users as well as HIV transmission and STDs in the general population.

Figure 1: factor of risky sexual and HIV infection behaviors among people living with HIV on ART and their outcome.

Background factors



1.5 Research questions

1. What is the prevalence of high sexual risk behavior among people living with HIV?
2. What is the prevalence of risky sexual behaviors among HIV positive patients on ART?
3. What are the factors associated with risky sexual behaviors among HIV positive patients on ART?

1.6 Objectives

1.6.1 Broad objective

To assess the prevalence and factors associated with risky sexual behaviors among people living with HIV on ART in Kisarawe District.

1.6.2 Specific Objectives

1. To determine the prevalence of high risk sexual behaviors among PLHIV on ART
2. To determine the prevalence of risky sexual behaviors among PLHI on ART
3. To identify factors associated with risky sexual behaviors among PLHIV on ART

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The prevalence of risk sexual behaviour among PLHIV at ART clinics in Kisarawe District.

Unprotected sex remains a concern among People Living with HIV (PLHIV). The prevalence of the problem varies from country to country. Generally the prevalence of unprotected sexual practice among PLHIV is very high in African countries ranging from

40.1% among males and 46.3% among females in Cape Town, South Africa to 83% in Uganda [3,4]. However, the prevalence of unprotected sexual practice among PLHIV in countries other than Africa is relatively low when compared to the African situation. It ranges from 23% in Croatia to 58% in Vietnam [5,6].

The Sexual Risk Behaviors in 5 countries studied in Sub-Sahara Africa showed a greater percentage of HIV-positive men than women had multiple sexual partners. While this percentage for women was below 10 percent in seven of the eight countries, for men it ranged from 14 percent to 34 percent. In eight countries, higher-=risk sex is more common than multiple partnerships. More men than women reported higher-risk sex in the past 12 months. It is possible that under-reporting could have contributed to the lower percentage among women. In all 5 countries, a larger percentage of men than women used a condom at last sex. Even so, in four countries (Malawi, Tanzania, Uganda and Zambia) more than 75 percent of men reported having unprotected last sex. The highest levels of condom use for both women and men were in Lesotho and Swaziland, where HIV prevalence rates are 26 percent and 31 percent, respectively. The percentage of HIV-positive men who reported having commercial sex is quite low, even among men with multiple sex partners.

Over time, prevalence of multiple partners and higher-risk sex has remained about the same in all five countries with two surveys, except for a marginally significant decrease in higher-risk sex among men in Tanzania. However, condom use at the last sex has more than doubled in Kenya,

Lesotho, Malawi and Zimbabwe, although it did not increase in Tanzania between the two surveys.

Despite the increasing trend in condom use in most of the countries, a large proportion of PLHIV have unprotected sex, which brings a great risk of transmission to their partners. The transmission risk is even greater if the infected person also has multiple partners. Mathematical modeling shows that concurrent partnership exponentially increases the number of infected individuals and the growth rate of the HIV/AIDS epidemic (9)

A Systematic Review and Meta-Analysis study about Alcohol Use and Sexual Risk Behaviors among Individuals Infected with HIV determined the current state- of-the-science concerning the (a) prevalence of alcohol use, (b) prevalence of sexual risk behaviors, and (c) strength of the association between alcohol and sexual risk behavior among individuals infected with HIV. Due to insufficient sample size ($k \leq 5$), moderator tests were conducted only for alcohol use, alcohol use before sex, condom use, and multiple sex partners and the prevalence was; Alcohol while drunk (Alcohol before sex)—Alcohol use before sex was more prevalent among studies conducted in Africa (40%; 95% CI = 33, 47; k = 3) compared to South-East Asia (22%; 95% CI = 18, 27; k = 4), QB (1) = 19.32, p <.001. (Two studies, one conducted in the European region [27] and another in the Western Pacific region [20], were excluded from the analyses.) The prevalence of alcohol use before sex was higher when studies sampled more women ($\beta = 0.13$, p =.043, k = 9), fewer MSM ($\beta = -0.44$, p <.001, k = 8), more drug users ($\beta = 0.49$, p <.001, k = 6), and participants who reported having multiple sexual partners ($\beta = 0.79$, p <.001, k = 7). Alcohol use before sex was less prevalent among PLWHA who were currently on ART ($\beta = -0.60$, p <.001, k = 8) and adherent to their HIV medication ($\beta = -0.99$, p =.010, k = 3).

Condom use :Condom use was more prevalent among studies conducted in South-East Asia (76%; 95% CI = 71, 80; k = 4) and the Americas (73%; 95% CI = 70, 76; k = 4) compared to Africa (64%; 95% CI = 59, 68; k = 2), QB (2) = 15.02, p <.001. (Two studies, one conducted in the European region [27] and another in the Western Pacific region [20], were excluded from the analyses.) The prevalence of condom use was higher when studies sampled more women ($\beta =$

0.17, p =.007, k = 12), fewer MSM (β = −0.48, p <.001, k = 11), fewer alcohol users (β = −0.67, p <.001, k = 12), fewer drug users (β = −0.19, p =.003, k = 10), and fewer participants who reported having multiple sexual partners (β = −0.64, p <. 001, k = 9). Condom use was more prevalent among PLWHA who were currently on ART (β = 0.57, p <.001, k = 10). Self-reported HIV medication adherence was not a significant predictor of the prevalence of condom use (β =−0.05, p =.779, k = 4).

Multiple sexual partners: the prevalence of multiple sexual partners was greater among studies conducted in the Americas (50%; 95% CI = 46, 53; k = 4) compared with Africa (17%; 95% CI = 12, 23; k = 2) and South-East Asia (14%; 95% CI = 11, 18; k = 3),QB (2) = 145.15, p <.001. (Two studies, one conducted in the European region [27] and another in the Western Pacific region [20], were excluded from the analyses.) The prevalence of participants with multiple sexual partners was higher when studies sampled fewer women (β = −0.22, p <.001, k = 11), more MSM (β = 0.24, p <.001, k = 11), more alcohol users (β = 0.21, p <.001, k = 11), and fewer drug users (β = −0.15, p <.001, k = 8). Multiple sexual partners were less prevalent among PLWHA who were currently on ART (β = −0.23, p <.001, k = 10) and were adherent to their HIV medication (β = −0.71, p <.001, k = 5).(10)

Consistent condom use among HIV-positive individuals is vital in reducing further transmission of HIV. A higher proportion of men in our study bought or carried condoms. This might partly explain the rise in condom use in higher risk sex in Ghana. However, an alarming proportion 31% (13 males, 69 females) of the participants reported that they did not use condoms during their last sexual intercourse. Furthermore, more than half (51%) of the study population with regular sex partners reported that they had unprotected anal or vaginal sex. These figures are disturbing as HIV-positive individuals in Ghana place others at risk of HIV infection and place themselves at risk for infection with sexually transmitted infections and super-infection with other HIV strains.(11)

The study conducted in India, data on correlates of inconsistent condom use with regular partners showed that; Almost all survey participants reported heterosexual sex with a regular partner in the past 3 months (97.0% of males and 98.0% of females), and almost all regular partners were spouses. Most participants with regular partners reported disclosing their HIV status to their regular partners (87.6% [85=97] of males and 94.9% [93=98] of females); reported their regular partners to be HIV positive (70.1% [68=97] of males and 91.8% [90=98] of females); and reported consistent condom use with regular partners (69.1% [67=97] of males and 73.5% [72=98] of females). However, about one third (30.9%) of men and one quarter (26.5%) of women reported inconsistent condom use for vaginal or anal sex with regular partners. In univariate logistic regression models, currently taking ART was a significant negative correlate of inconsistent condom use with regular partners; the significant positive correlates were having had casual sex in the past three months and using non-condom contraceptives. In the final multivariate model, currently taking ART remained as a significant negative correlate (OR¼0.3; 95% CI¼0.1–0.6) and having had casual sex in the past three months remained as a significant positive correlate (OR¼3.6; 95% CI¼1.1–12.0) of inconsistent condom use. Being female was a significant negative correlate (OR¼0.4; 95% CI¼0.2–0.9) in the multivariate model.(12)

Sexual practices and partner's related characteristics in the study conducted Ethiopia shows in the three months prior to the study, nearly two-thirds (63.1%) of respondents had used condoms in a consistent manner while 91 (15.1%) had used them inconsistently and 131 (21.8%) had never used a condom . More than one-third (36.9%) had one or more sexual encounter(s) without using a condom, of which 77.0% were with a steady partner, 16.8% with a casual partner and 6.3% with steady and/or casual partners. Those experiencing mixed partners were more likely to engage in unprotected sexual intercourse than those with either a steady or a casual partner ($p = 0.002$). Ninety percent of the respondents reported a single partner while the rest reported multiple partners. Multiple partners, defined as two or more partners, was significantly associated with unprotected sex ($p = 0.001$). Of those who reported a single partnership, 488 (90.2%) had a steady partner, whereas 53 (10.8%) had a casual

partner. Among those with multiple partners, the majority (60%) were casual partners, while 19 (32.67%) reported both steady and casual partners, these latter being more likely to engage in unprotected sex (p = 0.002). (13)

Also sexual behavior needs to take a central position in the heart of public health policy makers and researchers. This is important in view of its association with Sexually Transmitted Infections (STIs), including HIV. This is more important in the African continent because it comprises 13% of the world population, and bears 67% of the world's HIV/AIDS burden. Though the prevalence of HIV/AIDS is declining in Ethiopia (3.5% in 2005 to 1.5% in 2011), the country is still one of the hardest hit in the continent of Africa. The age specific prevalence of HIV in Ethiopia shows that people between the ages 20–29 are the most infected. HIV in Africa including Ethiopia is primarily transmitted heterosexually due to risky sexual behaviors such as premarital sex, having concurrent multiple sexual partners, and transactional sex. These behaviors are also prevalent amongst college students(14)

The study reported sexual behavior on Alcohol Consumption among HIV-Infected Persons in a Large Urban HIV Clinic in Kampala Uganda showed that; Of the 479 sexually active subjects, 282 (59.8%) reported using a condom at the last sexual encounter while 205/479 (43.4%) reported consistent condom use within the last 6 months. Most who reported protected sex used male condoms; only two subjects reported using female condoms. Among the sexually active subjects, 23.2% (107/479) reported sexual intercourse with 2 or more sexual partners within the last six months. A high proportion (73.4%) of sexually active subjects had disclosed their HIV status to their main sexual partner. The main sexual partners of the sexually active subjects were mostly HIV positive (n = 219), but many were HIV negative (n = 104) of unknown/undisclosed HIV sero-status (N = 151). Thirty-nine (5.4%) individuals reported high-risk sex within the last six months.(15)

On the other side the results in the study conducted rural Uganda showed that, Six months after initiating ART, risky sexual behavior reduced by 70% [adjusted risk ratio, 0.3; 95% confidence interval (CI), 0.2–0.7; P ¼ 0.0017]. Over 85% of risky sexual acts occurred within

married couples. At baseline, median viral load among those reporting risky sex was 122 500 copies/ml, and at follow-up, < 50 copies/ml. Estimated risk of HIV transmission from cohort members declined by 98%, from 45.7 to 0.9 per 1000 person years.(16)

Sexually active patients who were receiving antiretroviral therapy (ART) from five public hospitals in Trang province, Southern Thailand, were interviewed. Of 279 studied patients, 37.3% had unprotected sex in the prior 3 months and 27.2% did not disclose their serostatus to sexual partners. The median duration interquartile range (IQR) of using ART was 47 (27–60) months and 26.7% were non-adherent to ART (i.e., taking less than 95% of the prescribed doses). More than one-third had the perception that ART use would protect against HIV transmission even with unprotected sex. About 36.6% reported that they were unaware of their current CD4 counts and nearly one-third did not receive any safe sex counseling at each medical follow-up. After adjustment for potential confounders, non-adherence to ART and HIV-nondisclosure were strongly associated with an increase in the risk of unprotected sex with the adjusted odds ratio (aOR) of 5.03 (95% CI 2.68–9.44) and 3.89 (95% CI 1.57–9.61), respectively. In contrast, the risk for engaging in unprotected sex was less likely among patients having a negative-serostatus partner (aOR = 0.30; 95% CI 0.12–0.75), a longer duration of the use of ART (aOR = 0.98; 95%CI 0.97–0.99) and an unawareness of their current CD4 levels (aOR = 0.54; 95% CI 0.30–0.99) (17).

In Indian Journal of sexually transmitted diseases, High-risk sexual behavior was reported in 49 (24.5%) patients among 200 sexually active patients. Although the proportion of non condom users was high among the PLHA having multiple sexual partners. Almost all (98.0%) non condom users had unprotected sex with a partner of negative or unknown HIV status (18).

The study conducted in Ethiopia showed that 30.4% of the respondents had engaged in risky sexual practice, inconsistent use of a condom during sexual intercourse within the last 3 months prior to the study period. This result is consistent with the results of the study conducted in South Africa and Kenya, which had a prevalence of 30% and 28%, respectively. This may be due to the similarity in geographical area and other socioeconomic status of the

two populations. Another study conducted in Dar es Salaam, Tanzania, showed that the prevalence of unprotected sex was around 40.0%.[16] This is relatively higher than that seen in this study. This may be due to high numbers of tourists flowing and expansion of hotels as compared to Addis Ababa, thus making young women and men engage in commercial sex.(19)

2.4 Factors associated with risky sexual behaviors among patients on ART clinics in Kisarawe Districts.

In bivariate analysis of the study determined the factors associated with risky sex among PLHIV on antiretroviral therapy in Togo. PLHIV having unsafe sex was associated with the level of education of the participant (p = 0.016), duration of treatment (p = 0.001), alcohol consumption before sex (p = 0.005), disclosure of HIV status to their regular sexual partners (p = 0.002) and non- adherence to ART (p = 0.000). During multivariate analysis, four factors remained significantly associated with unsafe sex. PLHIV with poor adherence to ART were 2.6 times more likely to have unsafe sex (p= 0.014). In addition, PLWHA who consumed alcohol before sex were about 3.6 times more likely to have unsafe sex (p = 0.044). PLHIV with a higher level of education were less likely to have unsafe sex. PLHIV on ART for more than one year were more likely to have unsafe sex. (20)

Results for gender stratified univariable and multivariable analyses of factors associated with risky sex. Among males, ART receipt, alcohol misuse, HIV disclosure status, religious affiliation and adherence status were associated with risky sex in univariable analyses and therefore selected for the initial multivariable model. In the final multivariable model among males, reporting any risky sexual behavior was independently associated with alcohol misuse (aPR = 1.67; 95% CI: 1.07–2.60, p = 0.023), not disclosing HIV status to sexual partner (aPR = 1.69; 95% CI: 1.11–2.58, p = 0.014), being non-adherent to medication (aPR = 1.21; 95% CI: 0.98–1.50, p = 0.080), while controlling religious affiliation. Although subjects' religious affiliation was not statistically significant variable in the final model, it was retained in the final model because it improved model fit with a significantly lower model QIC-U.

Among females, the univariable analyses identified alcohol misuse, HIV disclosure adherence, marital status and income in last month as variables eligible for the initial multivariable model. In the final multivariable model for females, reporting any risky sexual behaviors was independently associated with non-disclosure of HIV status (aPR 2.45; 95% CI: 1.85–3.23, p<0.001) and being non-adherent to medication (aPR 1.42; 95% CI: 1.02–1.97, p = 0.036), but not significantly associated with alcohol misuse (aPR 1.29; 95% CI: 0.95–1.74, p = 0.098). (15)

Results of the regression analysis presented in Table 9 show the odds of greater comprehensive knowledge about AIDS as a result of higher educational attainment and prior HIV testing. Table 10 presents the effects of the same two predictors on knowledge of PMTCT. Men and women with less than secondary education, and those with no prior HIV testing, are treated as the reference group in results presented in both tables.

Secondary education has a strong positive relationship with comprehensive knowledge about AIDS among HIV-positive women in all countries. The odds of having comprehensive knowledge are 3.2 times higher in Kenya and 3.0 times higher in Tanzania for women with secondary education compared with women with no education or primary education. The positive association is also consistent among men across the countries. The odds ratios range from 1.6 in Zimbabwe to 4.0 in Kenya, although some countries such as Kenya and Tanzania show wide 95 percent confidence intervals. (21).

Also being married or in a cohabitating relationship is significantly associated with less condom use for both women and men. A study based on the Kenya 2003 DHS and the Malawi 2004-05 DHS had a similar finding (Anand, Shiraishi et al. 2009). In the same study, researchers also found that half of the married or cohabiting HIV-infected people in Kenya and more than 40 percent in Malawi had HIV-negative spouses.

Factors associated with condom use during the last sexual intercourse in one of study conducted in Ghana shows that participants who were widows or divorcees were 3.5 times

more likely to use condoms during their last sexual intercourse (95% CI: 2.0-13.9) than those who were single. Also, participants who had experienced HIV symptoms (OR=2.4; 95% CI: 1.3- 6.8), who had other sex partners (OR=4.5; 95% CI: 1.6-31.2) and who had disclosed their HIV status (OR=2.2; 95% CI: 1.3-12.9) were significantly more likely to have used condoms during their last sexual intercourse. Participants on ARV were 80% less likely to have used condoms during the last sexual inter- course (OR=0.2; 95% CI: 0.04-0.6). Participants with HIV/AIDS knowledge less than 50% were 90% less likely to have used condoms during their last sexual intercourse (OR=0.1; 95% CI: 0.01-0.7).(11)

In a Systematic Review and Meta-Analysis study about Alcohol Use and Sexual Risk Behaviors among Individuals Infected with HIV, five studies [19, 20, 22, 24, 31] of the 17 studies (N = 1,589) assessed the association between any alcohol consumption (yes, no) and unprotected sex (yes, no). Alcohol use was associated with unprotected sex, d+ = 0.23 (95% CI = 0.05, 0.40). The effect sizes were homogeneous indicating consistency across studies, Q(4) = 4.50, p = .34, I2 = 11% (95% CI = 0, 53).(10).

In study conducted in India, univariate and multivariate logistic regression of the factors related to high-risk sexual behavior among socio-demographic factors, on univariate analysis marital status (P = 0.00), current employment status (P = 0.04), spouse support (P = 0.00), alcohol intake (P = 0.01), and tobacco consumption (P = 0.01) were significantly associated with high-risk sexual behavior. About 38.3% of the non-adherent patient showed risky sexual behavior.

On multivariate analysis, non-supporting attitude of spouse was significantly associated with high risk (odds ratio [OR]: 18; 95% confidence interval [CI]: 1.4–225.5; P = 0.02). Patients who did not have spouse support were 18 times more likely to be engaged in high-risk sexual activities. Furthermore, high-risk sexual behavior was 9 times more among patients addicted to alcohol as compared to non-alcoholics (OR: 9.3; 95% CI: 2.4–35.4; P = 0.001). Marital status and current employment status were found non-significant during multivariate analysis.(18).

Risky sexual behaviors have been found to be significantly associated with pornography viewing. Muslim religion, male gender, urban origin, single accommodation, and higher level of education of the head of household during child- hood were other forces associated with sexual behavior among university students in Cameroon(22).

In the study conducted in Ethiopia, the gender of the respondents showed a significant association with risky sexual practice; among the respondents, males were 1.56 times more likely to engage in risky sexual practice than were female respondents. This may be due to the effect of a male-dominant culture, where male individuals practicing sex with many partners is considered more acceptable than females doing the same. Others studies reveal that females usually underreport their risk behaviors due to different undisclosed reasons.[21,22] This may be due to gender norms that are prevalent in Africa and other Asian countries with a male-dominant culture.(19).

Sex in a study conducted in Ghana: At multivariate analysis, this study found sex to be significantly associated with risk behavior (OR= 0.510, CI: 0.263- 0.989). Females were 50% less likely to engage in risky behavior compared to males. The association between sex and risky behavior has been reported in Demissie et al's. (2015) study, which found males to be one and a half times more likely to engage in risky behaviors than females (AOR =1.55, 95% CI: 1.01, 2.33). Though sex was significantly associated with sexual risk behavior in Angdembe et al's., (2015) study on sexual behavior of people with HIV in Nepal, females showed a 45% more likelihood of risky behavior with reference to males. (OR= 4.59, 95% CI: 1.15- 18.39). These results are not consistent with that of this study. The reason is likely to be that in a country like Nepal, females have a lesser power to negotiate for safe sexual practices like condom use.

Marital status in a study conducted in Ghana: With regards to marital status, this study depict that using married as reference, widowed and divorced have a significant association (OR= 0.159; CI: 0.056- 0.448 and OR= 0.118; CI: 0.038- 0.070) respectively with sexual risk behavior in Logistic Regression Model. The results are in line with (Ncube et al., 2012) where

divorced/widowed are significantly associated with risky behavior when compared with singles (OR= 3.5, CI: 2.0-13.9). More so, the significant association of marital status agrees with Demissie et al., (2015), who also reveal being widowed to be associated with sexual risk behavior (AOR =0.32, 95% CI: 0.13, 0.77). It is however key to note that in contrast to Dessie et al., (2011) study where marital status did not show any significance to risky sexual behavior, this study identified marital status to be significantly associated with sexual risk behavior ($p< 0.001$).(23)

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study area

The study was conducted in Public health institutions located at Kisarawe District that provides free Treatment and Care services for people living with HIV and are on Antiretroviral Therapy. The Kisarawe District Hospital is one of the oldest Hospitals in Tanzania, providing different inpatient and outpatient services mostly for Kisarawe dwellers and patients from Dar es Salaam. Up to 2016, a total of 21,340 PLHIV had started ART, among them 14,705 were females. The ART clinics that were involved data collection in this study were Kisarawe District Hospital, Mzenga Health centre and Homboza Dispensary.

3.2 Study design

This was descriptive, cross-sectional study.

3.3 Study population

The study participants were all people living with HIV and are ART attendees who had been sexually active in the past six months and were 18 years of age or above. In three treatment and care centers data was collected. The data was purposely collected in rural and urban areas of Kisarawe District at least to have the representative sample of study participants in selected service centers.

3.4 Sample size estimation

The following formula was used for estimating sample size

$$n = \frac{Z^2 p(1-p)}{d^2}$$

n= Sample size required

Z=1.96 (at 95% confidence interval)

P= expected proportion, in this case we will use 50% d = desired level of absolute precision +-5%

n= 1.96square * 0.5 (1– 0.5) / 0.05 square

n= 384.In this study we used 400 subjects

3.5 Sampling Procedure

Simple random sampling was employed ; The data was collected with two VCT staff, a nurse and a data clerk on the structured questionnaires from respondents self report information after they attended their normal routine getting antiretroviral therapy in CTCs.

3.6 Inclusion criteria

All ART patients 18 years and above

3.6 Exclusion criteria

All PLHIV attending CTC services that were seriously sick to be interviewed for at least one hour were excluded.

3.7 Variables

3.7.1. Dependent variables: Risk sexual behaviors

1. Non/Inconsistence condom use
2. Sex while drunk
3. Having multiple sexual partners

3.7.2 Independent variables

1. Socio-demographic factors (Sex, Age-group, Marital status, Educational level and Employment status)

3.8 Data collection instruments

The questionnaires with both closed and open ended questions were employed in this study to capture the information from the respective research participants. The questionnaire was both in English and Kiswahili versions to include both Kiswahili native speakers and English speakers that available. The questionnaires entailed the factors on sexual risk behavior and determinant factors among people living with HIV/AIDS on ART.

3.9 Data processing and analysis

Data collection records were checked for completeness on daily basis. After coding, data was entered into a computer, checked, cleaned and analyzed by SPSS statistical package. The figures, tables and descriptive statistics were used to summarize the data. The chi-square was used to establish statistical association between the independent and dependent variables. The Logistic regression was use to assess the factors that were associated with dependent variables. The p value of less than 0.05 was considered as statistical significance. The association between repeated sexual behavior and a set of demographic, social characteristics and the associated factors were determined.

3.10 Ethical consideration

An introductory letter attached with ethical clearance letter from Muhimbili University of Health and Allied Sciences (MUHAS) was submitted to the District Executive Director (DED) to give permission to conduct the study within Kisarawe District. I submitted a copy of letter to District Medical Office (DMO) and Medical Officer In-Charge (MOI) for information .At the health institutional level ,I have talked with health providers and briefing about the study in targeted dispensary, health center and hospital for establishment of good rapport during data collection process.

Ethical clearance for this study was obtained from Muhimbili University of Health and Allied Sciences (MUHAS). The permission to conduct the study in respective population was obtained from Kisarawe District Management. The initial procedure after District permission was provided an information to participants about the study especially assuring them confidentiality and anonymity. They were also requested to consent before administering those questionnaires. For those who provided their consent were required to sign them as an indication of acceptance.

CHAPTER FOUR

4.0 RESULTS

4.1. Socio demographic characteristics

A total number of 400 P L HIV on ART attending Care and Treatment Clinics (CTC) in Kisarawe District participated in this research study. Of those who participated, 212 (53%) were females, 162 (40.5%) were >=42 in age, 166 (41.5%) were married, 260 (65%) were primary education and 368 (92.9%) were self-employed. The social- demographic characteristics of the respondents are shown in Table 1 below.

Table 1: Demographic characteristics of the study population (N400)

Variable	Frequency, n	Percentage,%
Sex		
Male	188	47.0
Female	212	53.0
Age group		
18-25	26	6.5
26-33	81	20.2
34-41	125	31.3
>=42	162	40.5
Marital status		
Single	89	22.3
Married	166	41.5
Cohabiting	53	13.2
Separated	54	13.5
Widow	34	8.5
Missing	4	1.0
Education level		
No Formal Education	86	21.5
Primary Education	260	65.0
Secondary and above	54	13.5
Employment status		
Employed	18	4.5
Self employed	368	92.9
Non employed	10	2.5

4.2 Prevalence of risky sexual behavior among PLHIV on ART (n = 323)

Risky sexual behaviors were defined as having multiple sexual partners, having sex while under the influence of alcohol or drugs, and inconsistent condom use. The magnitude of these behaviors among the study respondents is shown in Table 3 below.

Table 2: Prevalence of risky sexual behaviors (n = 323)

Risky sexual behaviors	Frequency	Percentage, %
Inconsistence condom use (yes)	161	49.8
sex while drunk (yes)	143	44.3
multiple partner(yes)	137	42.4

Table 2 shows that inconsistent condom use (49.8%) was the leading risky sexual behavior, followed by44.3% who had sex while drunk and 42.4% who had multiple partner.

4.3 Factors associated with risky sexual behaviors among PLHIV on ART:

The study sought to understand the association between socio-demographic characteristics (Independent variables) and the risky sexual behaviors (Dependent variables). Logistic regressions were done and the results are displayed in the Tables below.

4.3.1. Association of between condom use and demographic characteristics (N=323)

This shows that females had a higher proportion (60.6%) of inconsistent condom use than males and the difference was statistically significant ($p<0.001$)., Moreover respondents who had no formal education constituted the highest percentage (54.3%) of respondents who did not use condom consistently compared to those who had primary and secondary levels of education.

Table 3: Association of between condom use and demographic characteristics

	Consistent Condom use; N=323		Chi2 (p-value)
Sex	Yes	No	
Male	100(59.5)	68(40.4)	13.11 (0.001)
Female	61(39.3)	94(60.6)	
Age group			
18-25	16(69.5)	7(30.4)	3.716(0.294)
26-33	27(50.0)	27(50.0)	
34-41	46(42.5)	62(57.4)	
>=42	67(50.8)	65(49.2)	
Marital status			
Single	31(55.3)	25(44.6)	1.233(0.873)
Married	72(48.6)	76(51.3)	
Cohabiting	16(50.0)	16(50.0)	
Separated	22(44.9)	27(55.1)	
Widow	17(50.0)	17(50.0)	
Education level			
No Formal Education	21(45.6)	25(54.3)	11.978 (0.003)
Primary Education	94(44.7)	166(55.2)	
Secondary and above	46(68.6)	21(31.3)	
Employment status			
Employed	15(60.0)	10(40.0)	1.552 (0.460)
Self employed	141(49.3)	145(50.7)	
Non employed	3(37.5)	5(62.5)	

Besides, Table 3 shows that the age group 34-41 had the highest proportion (57.4%) compared to other age groups, but the difference was not statistically significant (p=0.154). Similarly, regarding marital status, respondents who were separated had the highest

proportion (55.1%) of inconsistent condom users compared to other groups, but the difference was not statistically significant (p =0.286). Additionally, those who were not employed had the highest proportion (62.5%) of inconsistent condom users but the difference was not statistically significant (p =0.460).

These were further subjected to logistic regression and the results in Table 4 show that;

Table 4: Odd ratios for condom use and demographic variables that were significantly associated with condom use with chi-square test in Table 3

Factor	AOR(95%CI)	p-value
Age group		
18-25		
26-33	0.57(0.17-1.84)	0.349
34-41	0.45(0.15-1.34)	0.154
>=42	0.59(0.20-1.75)	0.347
Marital status		
Single		
Married		
Cohabiting		
Separated		
Widow		
Education level		
No Formal Education		
Primary Education	0.99(0.48-2.04)	0.988
Secondary and above	2.69(1.11-6.50)	0.027
Employment status		
Employed		
Self employed		
Non employed		

Multivariate analysis

Table 4 shows result of multivariate logistic regression analyses,

In multivariate regression analysis factors with P-value of less than 2.2 were incorporated in the model. Factors that were found to be independent predictors of inconsistence

condom use were female sex and secondary education and above. That is, females were more likely not to use condom consistently than men (AOR = 0.53, 95% CI (0.32-0.89). In addition, respondents who had secondary education and above were more likely not to use condom consistently (AOR= 2.69, 95% CI (1.11-6.50)) 4.3.2 Association of between having sex when drunk demographic characteristics

This shows that employed had a higher proportion (66.6%) of sex while drunk than self employed and none employed. In sex while drunk, therefore all other independent variables was not statistically significant (p>0.001)

Table 5: Association of between having sex when drunk demographic characteristics

	Sex while drunk; N=323		Chi2 (p-value)
	No; n (%)	Yes; n (%)	
Sex			
Male	96(57.5)	71(42.5)	1.53(0.22)
Female	82(53.3)	72(46.7)	
Age group			
18-25	16(69.5)	7(30.4)	12.057(0.007)
26-33	23(42.5)	31(57.4)	
34-41	51(48.1)	55(51.8)	
>=42	85(64.4)	47(35.6)	
Marital status			
Single	38(70.3)	16(29.6)	13.176(0.010)
Married	70(7.3)	78(52.7)	
Cohabiting	16(50.0)	16(50.0)	
Separated	34(69.4)	15(30.6)	
Widow	18(52.9)	16(47.1)	
Education level			
No Formal Education	27(58.7)	19(41.3)	0.368(0.832)
Primary Education	114(54.3)	96(45.7)	
Secondary and above	37(56.9)	28(43.1)	
Employment status			
Employed	8(21.6)	16(66.6)	12.88(0.01)
Self employed	105(30.3)	125(43.8)	
Non employed	8(80.0)	0(0.0)	

Besides, Table 5 shows that the Employed had the highest proportion (57.4%) compared to others, but the difference was not statistically significant (p=0.01). Similarly, regarding marital status, respondents who were married had the highest proportion (52.7%) of sex while drunk compared to others, but the difference was not statistically significant (p =0.010). Additionally, those who were 26-33 age group had the highest proportion (57.4%) of sex while drunk but the difference was not statistically significant (p =0.007).

These were further subjected to logistic regression and the results in Table 6 show that;

Table 6: Odd ratios for having sex when drunk and demographic variables that had significant association with chi-square test in Table 5

Factor	COR(95%CI)	p-value	AOR(95%CI)	p-value
Age group				
18-25				
26-33	3.08(1.09-8.71)	0.034	2.44(0.78-7.58)	0.124
34-41	2.46(0.94-6.48)	0.067	2.07(0.71-6.06)	0.183
>=42	1.26(0.49-3.29)	0.632	1.03(0.36-2.99)	0.953
Marital status				
Single				
Married	2.65(1.36-5.16)	0.004	2.49(1.18-5.25)	0.017
Cohabiting	2.37(0.96-5.88)	0.061	3.00(1.09-8.21)	0.032
Separated	1.05(0.45-2.43)	0.914	1.05(0.41-2.74)	0.915
Widow	2.11(0.87-5.15)	0.100	3.07(1.11-8.52)	0.031
Education level				
No Formal Education				
Primary Education	1.19(0.63-2.28)	0.586		
Secondary and above	1.07(0.50-2.31)	0.852		
Employment status				
Employed				
Self employed	0.64(0.28-1.44)	0.276		
Non employed	0.67(0.01-0.39)	0.003		

4.3.2 Association of between socio-demographic characteristics and having multiple sexual partners among PLHIV on ART

Table 7 shows that 18-25 age groups had a higher proportion (56.5%) of multiple sexual partner which is almost similar with Cohabiting (56.2%) than other independent variables. In multiple sexual partners, therefore all other independent variables was no significant association (p=>0.001)

Table 7: Association of between socio-demographic characteristics and having multiple sexual partners among PLHIV on ART

	multiple partner; N=323		Chi2 (p-value)
	No; n (%)	Yes; n (%)	
Wards			
Sex			
Male	95(56.5)	73(43.5)	0.154(0.694)
Female	91(58.7)	64(41.3)	
Age group			
18-25	10(43.5)	13(56.5)	0.871(0.276)
26-33	36(66.6)	18(33.3)	
34-41	60(55.5)	48(44.4)	
>=42	76(57.5)	56(42.4)	
Marital status			
Single	33(58.9)	23(41.0)	4.589(0.332)
Married	83(56.1)	65(43.9)	
Cohabiting	14(43.7)	18(56.2)	
Separated	32(65.3)	17(34.7)	
Widow	22(64.7)	12(35.3)	
Education level			
No Formal Education	31(67.3)	15(32.6)	2.291(0.318)
Primary Education	119(56.7)	91(43.3)	
Secondary and above	36(53.7)	31(46.3)	
Employment status			
Employed	15(60.0)	10(40.0)	0.251 (0.882)
Self employed	166(58.0)	120(41.9)	
Non employed	4(50.0)	4(50.0)	

Besides, Table 7 shows that the Age group 18-25 had the highest proportion (56.5%) compared to others, but the difference was not statistically significant (p=0.276). Similarly, regarding marital status, respondents who were cohabiting had the highest proportion (56.2%) of having multiple sexual partners compared to others, but the difference was not statistically significant (p =0.332). Additionally, those who were Non employed had the highest proportion (50.0%) of having multiple sexual partners but the difference was not statistically significant (p =0.882)

These were further subjected to logistic regression (crude odds ratio) and the results in Table 8 shows that;

CHAPTER FIVE

5.0 DISCUSSION

5.1 Prevalence of high risk sexual behavior

About half (49.2%) of PLHIV on ART who participated in this study reported high risk sexual behavior of inconsistent condom use. This high level of engagement in high risk sex among PLHIV is a matter of serious concern, which reflects laxity in practicing safe sex in this group. Similar results were found in a study in Urban Kenya which showed that close to one third of HIV patients on ART reported inconsistent condom use (24). HIV incidence rates in Tanzania have remained steady over the years despite widely available ART services. HIV treatment highly reduces transmission infectivity but this is counteracted by risky sexual behaviors among HIV patients. Participants for this study were all recruited from ART centers, therefore despite access to HIV prevention counseling and education, almost half of them had high risk sexual behavior. This could be explained by the fact that in most low income countries, HIV/AIDS treatment programs are not incorporated with HIV prevention strategies (24).

Of (49.8%) of the sexually active PLHIV interviewed in the study had used condom inconsistently. Female had higher inconsistent condom use than male and people with no formal education or have primary education were more likely not to use condom. Furthermore the prevalence of having sex while drunk and having multiple sexual partners were also high 44.3% and 42.4% respectively.

Gender and level of education were identified as important determinants of both inconsistent condom use and having multiple sexual partners. On the other hand married/cohabiting and unemployed participants were more likely to have multiple sexual relationships while employed participants had high proportion (66.6%) of engaging in sexual activity while drunk. Ragnasson et al observed the same findings in Kibera Kenya in 2014.(24)

Female were significantly more likely than men to report inconsistent condom use (AOR 0.53, 95%CI (0.52 – 0.89)). These findings are similar to those in a study by Ragnasson. Studies of the determinant of unprotected sex in PLHIV suggest that a range of factors can operate individually or interact to influence sexual behavior (25). This can right be related to social pressure on women to conceive a child or lack of individual decision making powers. A desire for children may lead to PLHIV ignoring the risk of unprotected sex(26). Also other studies have shown negative association with condom use such as "condoms are dirty or are for prostitute only (Moore AR, et al: 2008) as the reasons why inconsistent condom use is higher in females than in males.

In multivariate analysis factors found to be independent predictors of inconsistence condom use were being a female and having secondary education and above. Female were likely not to use condom consistently than male (AOR 0.53, 95%CI (0.52 – 0.89), and having secondary education and above were also more likely not to use condom.

Age, marital status and employment were not statistically significant, had no association ($p>0.001$) with condom use.

In this study age, marital status and employment status were significantly associated with having sexual intercourse while drunk. Employed participants had higher proportion 66.6% than self-employed and none employed. But at multivariate level only marital status (married, cohabiting and widowed) were more likely to have sex when drunk. Engaging in multiple sexual partners relationship is considered one of the highest risk behavior (27).

In this study, 137 (42.4%) of HIV patients on ART reported to have multiple sexual partners. This finding suggests that more than a third of sexually active engage in risky sexual behavior. This behavior increases the risk of re-infection in PLHIV and of transmission to the general population. Similar results were observed in a study done in Botswana(28). It is suggested that patients with multiple sexual partners are significantly less likely to use condoms and to disclose their status to their partners

Besides, some of the sexually active respondents reported to have sex while drunk. It a known fact that alcohol impairs reasoning and decision-making, thereby compromising the likelihood effective condom use. Similar findings have been reported elsewhere(29)

5.2 Limitations of the study

Data obtained in this study was based on self-reports. Topics about HIV and sexual behaviors are still considered sensitive in many cultures. Therefore the real prevalence of risky sexual behaviors might have been under reported. That is, the study might have suffered social desirability bias. This was mitigated by provision of a thorough explanation on objectives of the study and assurance of confidentiality.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusions

This study has come up with five key findings, which are: 1) A half of the respondents reported inconsistence condom use during sexual intercourse. 2) 44.3% and 42.4% respectively reported to play sexual intercourse when drunk and or with multiple partners; 3) Females were more likely to report inconsistence condom use during sexual intercourse than males; 4) respondents with secondary education or higher were more likely to report consistence use of condom more than those with lower education; 5) Respondents in younger age-groups were less likely to report having sex when drunk compared to subjects in older age-groups. Overall, the findings suggest that engagement in high risk sexual behavior among people on ART is real. This phenomenon has implication for re-infection with resistant HIV strains among PLHIV and transmission of the same to the general population. Moreover, the fact that women were more likely to succumb to high risk sexual behavior suggests a need for gender responsiveness of the interventions.

6.2 Recommendations basing on the finding of this study, it is recommended that:

1. In order to curb new HIV infections and the spread of drug resistant HIV strains, more efforts should be employed to promote safer sexual behaviors not only among HIV negative people but also among PLHIV.
2. Also due to high prevalence of risky sexual behaviors among PLHIV on ART in Kisarawe district, efforts should be made in educating people on the effects of re-infection by not practicing safe sex.
3. Preventative strategies for PLHIV have to work in relation to gender dynamics, education marital status. Safer sexual practices are often a collective concern; hence preventative strategies should be gender specific.
4. Studies to identify reasons why married, cohabiting and widowed indulge in sex when drunk should be undertaken so that new prevention measures can be identified.

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APPENDICES

Appendix I: Informed Consent English Version

Instruction to interviewer:

After ensuring that the potential respondent meets the eligibility criteria for participation in this study, please read the following introductory statement

Introduction

Hello my name is a master's student at MUHAS. I am doing a survey to compare young adult sexual behaviour among those who have started ARVs and those who have not started. Since you have selected as participant of this research, I would like to ask you some few questions about your experience.

Purpose of the study:

We are conducting a study to better understand the participants sexual behaviour in relation to the services provided at CTCs. We are interested in learning more about your sexual behaviour on the control of risk sexual behaviours among young adult and other population. The results of this study will be used to improve sexual behavior and provide alternative solution of the HIV related problems towards public health improvement efforts in Tanzania and World at large.

Procedures:

I will ask you questions about your background, your experiences at MNH, your perceptions on quality of services you received, behaviors and attitudes of health providers. This will take about 10 minutes.

Benefits

This survey may not be of the direct benefit to you but the information you share with us will be used to develop programs and policies which will benefit the clients of MNH and suggest the area of improvement to the management.

Potential Risks

There is no risk participating in this study, your name or personal information will not be collected. All forms and study tools will not contain any personal information but will use a unique identification number. All information collected will only be used for the purposes of this study.

Statement of Rights and Confidentiality

Participation in the study is voluntary. If you do not participate in this study it will not impact the care you receive in the future and neither should it stop you from participating in other study. Additionally, if I ask you any question you don't want to answer, we can skip to the next question, or we can stop the interview at any time. Your views are important, so we do hope that you participate.

Do you have any questions? Volunteers Statement:

I have been given a chance to ask questions about this research study. These questions have been answered to my satisfaction. For questions about participation in the study, I may contact:

Isihaka Hamidu (The Principal Investigator at Muhimbili University): +255714962894 or +255783124116 or at my office in MHIC near the Department of Psychiatry at Muhimbili

For questions about my rights as a research subject in this study, I may contact: Prof. Said Aboud (Director of Research and Publications of Muhimbili University of Health and Allied Sciences):Email; saboud@muhas.ac.tz, Tel: +255 022 2150302/6 ext 1016 or +255 022 2152489

I agree to participate in this study. I have been given a copy of this form for my own records.

If you wish to participate, you should sign below.

Signature of Person Obtaining Consent_____Date _____

Signature of Participant_____ Date_____

Appendix II: Fomu ya Ridhaa kwa Lugha ya Kiswahili

Tathmini ya tabia hatarishi za ngono miongoni mwa watu wanaoishi na VVU/UKIMWI kwenye Wilaya ya Kisarawe.

Fomu ya ridhaa ya mshiriki

*Baada ya kuhakikisha kua mshiriki ametimiza vigezo vya kushiriki kwenye utafiti huu, soma maelezo ya utangulizi yafuatayo tafadhali*Mwanzo

Habari yako, Isihaka Hamidu (Mimi) ni mwanafunzi wa shahada ya pili Chuo Kikuu cha

Muhimbili. Nafanya utafiti kujua hali ya tabia hatarishi miongoni mwa watu wenye miaka **18** na waliozidi miaka **18** ambao wanaishi na VVU wale walioanza TIBA na wale ambao hawajaanza TIBA lakini wanahudhuria **Kliniki (CTC)** kwenye Wilaya ya Kisarawe. Kwa sababu umechaguliwa kuwakilisha wanaoishi na VVU kwenye utafiti huu, ninapenda kukuuliza maswali machache kwa uzoefu wako.

Lengo la Utafiti huu

Utafiti huu unafanywa ili kujua tabia hatarishi za ngono na kuzilinganisha miongoni mwa wanaoishi na VVU ambao wameanza Tiba na wale Wasioanza Tiba lakini wanahudhuria Kliniki kwenye wilaya ya Kisarawe. Kwenyeutafiti huu napenda hasa kujua kama wanaoshiriki huduma kwenye hivi vituo vya uangalizi na Tiba wanaweza kubadili tabia hatarishi za ngono baaada ya kupata elimu na tiba kwenye vituo vya huduma. Matokeo ya utafiti huu yatatumika kuelekeza njia sahihi za kupunguza tabia hatarishi zinazopelekea maambukizi ya VVU, lakini pia yatanisaidia kupata Shahada ya pili ya Afya ya Umma (MPH) kwenye Chuo Kikuu Kishiriki cha Afya na Tiba Muhimbili.

Utaratibu

Nitakuuliza maswali machache kuhusu historia yako, uzoefu wako toka umehudhuria kliniki, uelewa wako wa tabia hatarishi za ngono, wenza wako na ushiriki wako kwenye shughuli za kiuchumi. Haya mahojiano yatatumia dakika 15 au zaidi.

Faida

Unaweza usifaidike mojakwamoja, lakini taarifa unazotupa zitasaidia kufanya mipango na sera za Afya ambazo zitakusaidia wewe na watanzania kwa ujumla kwa maboresho ya Afya.

Madhara

Madhara ambayo unaweza kuyapata kwa kushiriki kwenye utafiti huu ni kama kutojiskia vizuri kwa maswali utayoulizwa yanaweza kukuathiri kisaikolojia na kiafya, lakini jina lako na taarifa zako binafsi hazitochukuliwa. Fomu zote na maswali yote hayatochukua jina lako ila utatumia namba ya utambulisho kutofautisha washiriki. Taarifa zote zitazochukuliwa zitatumika kwa malengo ya utafiti tu.

Uhiyari na Usiri

Kushiriki kwenye utafiti huu ni hiyari. Kama hutoshiriki kwenye utafiti huu utaendelea kushiriki huduma za kliniki kama kawaida na pia haitokusababishia usishiriki kwenye tafiti nyingine. Kwa kuongeza, kama hujisikii kujibu swali lolote, tunaweza kuruka hilo swali, pia kama husijisikii kuendelea na usaili tunaweza kuacha usaili. Mawazo yako ni muhimu sana, hivyo tunatumai utashiriki.

Una swali lolote?

Taarifa za Wanaojitolea:

Nimepewa nafasi ya kuuliza maswali kuhusu utafiti huu. Maswali haya yamejibiwa kwa kuniridhisha. Kwa maswali kuhusu ushiriki katika utafiti, naweza kuwasiliana na:

Isihaka Hamidu (Mtafiti Mkuu) aliyeko Chuo Kikuu cha Muhimbili:

0714962894 au **0756679367** au katika ofisi zake zilizopo katka kituo cha maelezo ya Afya jirani na idara ya Magonjwa ya Akili.

Kama nina maswali yoyote kuhusu haki zangu kama mshiriki katika utafiti huu, naweza kuwasiliana na:

Prof. Said Aboud (**Mkurugenzi wa Utafiti na Machapisho,** Chuo Kikuu cha Muhimbili) Email; saboud@muhas.ac.tz, simu **0222150302/6** ext **1016** au **0222152489**. Nakubali kushiriki katika utafiti huu. Nimepewa nakala ya fomu hii kwa ajili ya kumbukumbu zangu mwenyewe.

Kama utashiriki, weka sahihi hapo chini.

Sahihi ya Anayepokea Ridhaa_____ Tarehe_____

Sahihi ya Mshiriki_____ Tarehe_____

Appendix III: Questionnaire English Version

	PERSONAL INFORMATION		
Q1	*Location of interview (District)*	Kisarawe District	1
Q2	*Ward*	Kisarawe Mzenga Homboza	1 2 3
Q3	*Sex*	Male Female	1 2
Q4	*Age: 18-25, 26-33, 34-41, 42+*	*18-25,* *26-33,* *34-41,* *42+*	1 2 3 4
Q5	*Marital status:*	*Married* *Never married* *Widowed* *divorced* *Live with friend as if married*	1 2 3 4 5
Q6	*Have you ever attended school?*	*Yes* *No*	1 2
Q7	*What is the highest level of school you attended: primary, secondary, or higher?*	*Primary* *Secondary* *Higher*	1 2 3
Q8	*What is the basic economic activity that earns you income?*	*Employed* *Self employed* *Not employed*	1 2 3

HIV INFECTION BEHAVIOR-RELATED QUESTIONS FOR PLHIV ON ART: **Now I am going to ask you a few questions about prior HIV testing.**			
Q9	Do you have a regular sex partner?	*Yes* *No*	
Q10	Have you disclosed the results of your prior HIV test with your partner?	*Yes* *No*	1 2
Q11	To your knowledge, has your partner ever had an HIV test?	*Yes* *No* *Don't know*	1 2
Q12	Has your partner disclosed the results of his/her HIV test to you?	Yes No	1 2
Q13	What were the results of your partner's HIV test?	Positive Negative *Don't know*	1 2
Now I am going to ask you a few questions about Sexual Practice			
Q14	Have you ever had sex with partner(s) in your lifetime?	Yes No *Don't know*	1 2
Q15	Have you had sex with partner(s) in the past six months?	Yes No	1 2
Q17	In the past 6 months, how many sexual partners have you had, including your main partner	One partner More than one partner	1 2
Q18	Do you think your main partner has other sexual partner(s)?	Yes No *Don't know*	1 2

Now I am going to ask you a few questions about consistent condom use and condom awareness			
Q19	Have you ever used condom in your life time when having sex with your sexual partner(s)?	Yes No	1 2
Q20	During past 6 months, did you use a condom when having sex with your partner(s)?	Never, none of the time Rarely, once in a while Always	1 2 3
Q21	During past 6 months, did you use condom consistently when having sex with partner(s)	Yes No	1 2
Q22	Correct use of condom will prevent HIV/AIDS transmission and STIs	Yes No	1 2
Q23	Correct use of condom will reduce the chance of getting HIV	Yes No	1 2
Sexual risk behavior			
Q24	In the past 6 months, have you had sex with your main partner?	Yes No *Don't know/declined to answer*	1 2 3
Q25	Have you had any STI in the past six months	Yes No	

Q26	In the past 6 months, have you had sex with someone besides your main partner	Yes No *Don't know/declined to answer*	1 2 3
Q27	Do you think your main partner has other sexual partners?	Yes No *Don't know/declined to answer*	1 2 3
Q28	In the past 6 months, have you done any of the following *(check all that apply)*?	☐ Discussed HIV with friends or family ☐ Disclosed HIV status to friends or family ☐ Increased condom use ☐ Decreased condom use ☐ Increased sexual activity ☐ Decreased sexual activity Don't know	1 2 3 4 5 6

Perceived benefits and risks: Now I am going to read you some statements about your own beliefs about ARVs. Please answer each question using, "disagree," "agree, and "not applicable."			
Q29	ARV does not always protect you from getting new HIV and other infections, even if you take it every day.	☐ Disagree ☐ Agree ☐*Don't know/declined to answer*	1 2 3
Q30	If someone is HIV positive, taking ARVs every day reduces the chance of transmitting the HIV virus to another person.	☐ Disagree ☐ Agree ☐*Don't know/declined to answer*	1 2 3
Q31	If someone is HIV positive and taking ARVs every day, they do not need to use condoms when they have sex to prevent transmitting HIV to their sexual partners.	☐ Disagree ☐ Agree ☐*Don't know/declined to answer*	1 2 3
Q32	Have you planned give your partner pregnancy(Male) or to conceive in next 6 months	Yes No	1 2
<u>RELATIONSHIP QUESTIONS:</u> **Now I am going to ask you some questions about your relationship with your main sexual partner.**			
Q33	Prior to participating in this study, did you ever discuss HIV with your partner?	*Yes* *No* *Don't know*	1 2 3

Q34	Can you say no to your partner if you do not want to have sexual intercourse?	*Yes* *No* *Don't know*	1 2 3
Next I am going to ask you a few questions about your alcohol use.			
Q35	Have you consumed alcohol in your lifetime?	Yes No	1 2
Q36	In the past six months, how often did you drink alcohol? If you don't know exactly give a best guess.	Daily Once a week Once a month Never	1 2 3 4
Q37	In the past 6 months, how frequently did you use alcohol before sexual intercourse with your main partner?	Daily Once a week Once a month Never	1 2 3 4
Thank you for participation, please if you have any question for me?			

Appendix IV: Dodoso la Kiswahili

Q1	*Mahala usahili unapofanyika (District)*	Kisarawe District	1
Q2	*Kata*	Kisarawe Mzenga Msimbu	1 2 3
Q3	*Jinsia*	Mwanaume Mwanamke	1 2
Q4	*Umri: 18-25, 26-33, 34-41, 42+*	*18-25,* *26-33,* *34-41,* *42+*	1 2 3 4
Q5	*Hali ya Ndoa:*	*Single* *Married* *Cohabiting* *Separated* *Widowed*	1 2 3 4 5
Q6	*Jee umesoma shule?*	*Ndiyo* *Hapana*	1 2
Q7	*Umefikia kiwango gani cha juu cha shule umefikia: Shule ya msingi, Sekondari, au Elimu ya juu ?*	*Sijasoma shule* *kabisa* *Shule ya Msingi* *Sekondari na kuendelea*	1 2 3
Q8	*Shughuli ya Msing ya kujiingizia kipato*	*Nimeajiriwa* *Nimejiajiri mwenyewe* *Sijaajiriwa*	1 2 3

HIV INFECTION BEHAVIOR-RELATED QUESTIONS FOR PLHIV ON ART: **Sasa nitakuuliza maswali machache kuhusu upimaji wa VVU hapo kabla.**			
Q9	Jee una mwenzi wa kimsingi (wa karibu) wa ngono?	*Ndiyo* *Hpana*	
Q10	Ulishawahi kumshirikisha mwenzi wako wa ngono majibu yako ya VVU ya hapo awali?	*Ndiyo* *Hapana*	1 2
Q11	Kwa uelewa wako, mwenzi wako alishawahi kupima maambukizi ya VVU	*Ndiyo* *Hapana* *Sijui*	1 2
Q12	Mwenzi wako amewahi kukushirikisha majibu yake ya kipimo cha VVU?	Ndiyo Hapana	1 2
Q13	Majibu ya mwenzi wako ya kipimo cha VVU yalikuaje?	Ana VVU Hana VVU *Sijui*	1 2
Now I am going to ask you a few questions about Sexual Practice			
Q14	Ulishawahi kufanya ngono na mwenzi (wenzi) wa ngono katika maisha yako?	Ndiyo Hapana *Sijui*	1 2
Q15	Ulishawahi kufanya ngono na mwenzi (wenzi) wa ngono katika miezi 6 iliyopita?	Ndiyo Hapana	1 2
Q17	Katika miezi 6 iliyopita, wenzi wangapi wa ngono ulishakua nao, akiwemo mwenzi wako mkuu?	Mwenzi mmoja tu Zaidi ya mwenzi 1	1 2
Q18	Unafikiri mwenzi wako wa karibu wa ngono ana	Ndiyo	1

	mwenzi/wenzi wengine wa ngono?	Hapana *Sijui*	2
Now I am going to ask you a few questions about incosistance condom use and awareness			
Q19	Katika maisha yako ulishawahi kutumia kondomu ulipofanya ngono na mwenzi/wenzi wako wa ngono?	Ndiyo Hapana	1 2
Q20	Katika miezi 6 iliyopita, ulitumia kondomu ulipofanya ngono na mwenzi/wenzi wako?	Sijawahi, hata mara moja Marachache, mara mojamoja Muda wote	1 2 3
Q21	Katika miezi 6 iliyopita, umetumia kondomu ipasavyo ulipokua ukifanya ngono na mwenzi/wenzi wa ngono?	Sijawahi, hata mara moja Marachache, mara mojamoja Muda wote	1 2 3
Q22	Matumizi sahihi ya Kondomu yatazuia maambukizi ya VVU/UKIMWI na Magojwa ya kuambukiza ya ngono (STIs)	Ndiyo Hapana	1 2
Q23	Matumizi sahihi ya Kondomu yatapunguza uwezekano wa kupata maambukizi ya VVU	Ddiyo Hapana	1 2
Sexual risk Behavior			
Q24	Katika miezi 6 iliyopita, Ulishafanya ngono na mwenzi wako wa karibu/wakimsingi?	Ndiyo Hapana *Sijui/amekataa kujibu*	1 2 3
Q25	Ulishawa kuugua magonjwa ya kuambukiza ya ngono katika miezi 6 Iiliyopita	Ndiyo Hapana	

Q26	Kataka miezi 6 iliyopita, ulishafanya ngono na mtu mwingine tofauti na mwenzi wako wa kimsing/mkuu wa ngono?	Ndiyo Hapana *Sijui/amekataa kujibu*	1 2 3
Q27	Unadhani mwennzi wako wa kimsingi ana mwenzi mwingine wa ngono?	Ndiyo Hapana *Sijui/ amekataa kujibu*	1 2 3
Q28	Katika miezi 6 iliyopita, umefanya lolote kati ya yafuatayo *(chagua yanayohusika tu)*?	☐ Kuzungumza kuhusu VVU na marafiki ☐ Kuwashirikisha majibu ya VVU marafiki au familia ☐ Nimeongeza idadi ya kutumia kondomu ☐ Nimepunguza idadi ya kutumia kondomu ☐ Nimezidisha ngono ☐ Nimepunguza ngono	1 2 3 4 5 6

		☐Sijui	
PERCEIVED BENEFITS AND RISKS: Sasa nitakusomea maelezo mengi yanayohusu namana unavyoiamini dawa ya kupunguza makali ya VVU (ARVs). Tafadhali jibu kila swali kwa kutumia, “sikubali,” “nakubali, na “haihusiki.”			
Q29	ARV sio mudawote inakulinda wewe kutokupata maambukizi mapya na mengine, hata kama unatiumia (ARVs) kila siku.	☐ Sikubali ☐ Nakubali ☐*Sijui/amekataa kujibu*	1 2 3
Q30	Kama mtu ana maambukizi ya VVU, na anatumia ARVs kila sikuinapunguza uwezekano wa kumuambukiza VVU mtu mwingine.	☐ Sikubali ☐ Nakubali ☐*Sijui/amekataa kujibu*	1 2 3
Q31	Kama mtu ana maambukizi ya VVU, na anatumia ARVs kila siku, halazimiki kutumia kondomu anapofanya ngono ili kumkinga mwenzi/kuwakinga wenzi wake wasipate VVU.	☐ Sikubali ☐ Nakubali ☐*Sijui/amekataa kujibu*	1 2 3
Q32	Ulishapanga kumpa mwenzi ujauzito(Mwanaume) au kubeba ujauzito (Mwanamke) katika miezi 6 ijayo	Ndiyo Hapana	1 2
RELATIONSHIP QUESTIONS: **Sasa nitakuuliza maswali kuhusu mahusiano yako na mwenzi wako wa kimsingi wa ngono.**			
Q33	Kabla ya kushiriki utafiti huu, ulishawahi kuzungumza na mwenzi wako kuhusu VVU?	*Ndiyo* *Hapana* *Sijui*	1 2 3
Q34	Unaweza kumkatalia mwenzi wako kufanya ngono kama hutaki kufanya ngono?	*Ndiyo* *Hapana* *Sijui*	1 2 3

Next I am going to ask you a few questions about your alcohol use.			
Q35	Ulishawahi kutumia/kunywa pombe katika maisha yako?	Ndiyo Hapana	1 2
Q36	Katika miezi 6 iliyopita , marangapi umekunywa pombel? Kama hukumbuki jaribu kubuni.	Kilasiku Maramoja kwa wki Maramoja kwa nwezi Sijawahi kamwe	1 2 3 4
Q37	Katika miezi 6 iliyopita, marangapi umetumia pombe/kunywa pombe kabla ya kushiriki/kufanya ngono na mwenzi/wenzi wako wako wa ngono?	Kilasiku Maramoja kwa wki Maramoja kwa nwezi Sijawahi kamwe	1 2 3 4
Asante kwa kushiriki, tafadhali kama una swali lolote linalohusu mahojiano niulize?			