FACTORS THAT INFLUENCE TREATMENT ADHERENCE AMONG MALE SEX WORKERS ON ANTIRETROVIRAL THERAPY IN NAIROBI CITY COUNTY, KENYA

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Factors that Influence Treatment Adherence among Male Sex Workers on Antiretroviral Therapy in Nairobi City County, Kenya

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DECLARATION

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

Signature……..... Date……

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This thesis has been submitted for examination with our approval as University Supervisors

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DEDICATION

To my husband Masha, children Nikita, Malika, Zalika and Malena, my parents Charity Laibon and the Late James Laibon.

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ABBREVIATIONS AND ACROYNYMS

AIDS	Acquired Immunodeficiency Syndrome
aOR	Adjusted Odds Ratio
ART	Antiretroviral Therapy
ARV	Antiretrovirals
CBO	Community Based Organisation
CD4	Cluster of Differentiation 4
CSV	Comma Separated Values
CEI	Conditional economic incentives
CI	Confidence Intervals
CTX	Cotrimoxazole
FGD	Focus Group Discussion
FSW	Female Sex workers
GMHR	Global Men's Health and Right Study
HAART	Highly Active Antiretroviral Therapy
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
HOYMAS	Health Options for Young Men with AIDS/Sexually Transmitted Infections
HPTN	HIV Prevention Trials Network
HTTPS	Hyper Text Transfer Protocols
IDU	Injecting Drug Users
INRUD-IAA	International Network for the Rational Use of Drugs Initiative on Adherence to Antiretroviral Therapy
MARPs	Most-at-risk populations for HIV

mDOT	Modified directly observed therapy
MSM	Men who have sex with men
MSW	Male Sex Workers
NACC	National AIDS Control Council
NASCOP	National AIDS and STI Control Programme
NGO	Non-GovernmentalOrganisation
NS	Not Significant
ODK	Open Data Kit
OR	Odds Ratio
PCA	Principal Component Analysis
PI	Personal Identification
PrEP	Pre-Exposure Prophylaxis
RDS	Respondent Driven Sampling
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences
STI	Sexually Transmitted Infections
TasP	Treatment as Prevention
UNAIDS	The Joint United Nations Programme on HIV and AIDS
VCT	Voluntary Counselling and Testing
WHO	World Health Organisation

ABSTRACT

Adherence to antiretroviral medications is important in transforming and expanding treatment programmes for both individual and public health benefit. The medications are known to reduce the risk of transmission of HIV and reduce AIDS related mortality if adhered to. This study set out to determine factors that influence treatment adherence, based on self-reporting assessment among male sex workers on Antiretroviral Therapy in Nairobi City County, Kenya. Using a cross-sectional study design, quantitative and qualitative research methods, 260 male sex workers receiving antiretroviral therapy, were selected through respondents driven sampling and interviewed using a semi- structured questionnaire. Three focused group discussions with 37 male sex workers and 12 key informant interviews (3 clinicians, 3 pharmacist, 3 counsellors and 3 treatment site managers) were conducted. The quantitative date was analyzed using Statistical Product and Service Solutions (SPSS) version 12 and thematic analysis done for qualitative data. Univariate, bivariate, and multivariable analyses assed the proportion of adherence and correlates of self- reported adherence. Chi-square test and Fisher's exact test was done and P-values set at < 0.05 was considered statistically significant. Odds ratios were used to show the strength of association. Factor analysis was done to extract most important barriers of adherence. The proportion of male sex workers who self-reported adherence was established at 40% (104) as compared to non-adherence of 60% (158). Factors that influenced self-reported adherence among the male sex workers were Antiretroviral therapy associated cost ART ($\chi 2 = 10.767$, d.f=1, p=0.001;) knowledge on HIV and ART (Fishers Exact Test p=0.045) alcohol and drug abuse Fisher Exact Test ($p<0.001$); perceived poor treatment by ART health provider ($\chi 2 = 4.9364$; d.f=1; p=0.026) and ever had a clinical monitoring test of CD4 count ($\chi 2 =11.143$;d.f=1;p=0.001) and main reason for getting into sex work ($\chi 2 =5.715$, d.f=1 p=0.017) and perceived barriers of ART ($p<0.00$) Fisher Exact Test). Those who score highest on knowledge of HIV and ART were more likely (OR 2.1; 95% CI; 1.1-3.8) compared to those who scored the least. Those who reported clinical monitoring through CD4 count were more likely (OR 3.4; 95% CI; 1.6-7.2) while those who abused alcohol and drugs and perceived they are poorly treated by the

ART provider were unlikely to adhere. Experience of side effects, lack of support or care, sharing of pills and lack of time to attend clinics ($p<0.001$Fisher's Exact Test) were identified as the key barriers correlated to self-reported non-adherence. The use of multidimensional male sex workers centered treatment model that addresses structural barriers such as cost related to antiretroviral access, sensitizing of health care workers against homophobic tendencies and integrated with interventions to address alcohol and drug abuse and is recommended.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Treatment adherence describes the extent to which patients follow through with agreed-on or prescribed actions, or do what providers expect them to do, where treatment is concerned (Zweben & Zuckoff, 2002).In medical settings, patient adherence is one of the greatest impediments of achieving treatment goals.

Adherence to Antiretroviral Therapy (ART), which is defined as the use of ART at the right dose, at the right frequency of dosing and at agreed times, is essential for adequate suppression of viral replication and to prevent the emergence of resistant viral strains (Paterson *et al.,* 2000; Ickovics & Meade*et al.,* 2002). The ability of a patient to keep to the pattern of taking their ART at ≥ 95% is accepted as optimal adherence (Attia *et al.,* 2009; Quinn *et al.,* 2000). In recent years, the importance of adherence to ART was underscored by a multinational trial study whose results established that the use of ART, coupled with optimal (95%) adherence rates reduced the risk of sexual transmission by 96% in heterosexual partners (Cohen *et al.,* 2011). The efficacy of ARVs in reduction of the risk of HIV transmission has been correlated closely with drug adherence in several multi-country studies (Grant *et al.,* 2010).

Globally, the challenge of ART adherence is acknowledged amidst efforts to expand treatment coverage. By the end of 2015, there were 17 million people on ART worldwide. Kenya had the second largest treatment programme in Africa, with nearly 900,000 people of the 1.6 million people living with HIV on ART (UNAIDS, 2016). In a study conducted in 2012, more than three quarters of the people living with HIV that were on ART in Kenya achieved viral suppression (MOH, 2012).

Kenya has a mixed pattern of HIV epidemic which is generalized among the mainstream population, and concentrated in specific geographical locations and populations (World Bank, 2007). The populations at a higher risk of HIV infection

in the country were identified as male sex workers (MSW), men who have sex with men, female sex workers and their clients, people in prison and people who inject drugs. These populations cumulatively contributed a third of new HIV infections in the country (Gelmon *et al.*, 2009).

Globally, men who have sex with men are 19 times more likely to have HIV as compared to the general population. Similarly, sex workers are 12 times more likely to be living with HIV when compared to the general population (UNAIDS 2014).In Kenya nearly one in five (18.2%) of men who have sex with other men and MSW are HIV positive (NACC & NASCOP, 2012).Same-sex sexual acts are criminalised in 78 countries and are punishable by death in seven countries. Sex work is illegal and criminalised in 116 countries (UNAIDS, 2014). In Kenya both same sex sexual acts and sex work are criminalised under the penal code (Government of Kenya, 2008).

Nairobi, the capital city of Kenya has the largest population of male sex workers, men having sex with men and female sex workers in comparison to other cities (NASCOP, 2013). The County also has the highest (163,287) number of people living with HIV with additional estimated 4,719 people newly infected with HIV in 2015 (NACC, 2016).Despite the declining prevalence of the HIV epidemic in the general population, MSW are one of the key groups where new infections continue to occur (Baral *et al*., 2012). This situation has been attributed to factors such as increased stigma levels, poor access to HIV testing and prevention services due to fear of health-care seeking, denial of care, and even black mail (Fay *et al.,* 2011; Lane, 2008), which affect adherence to ART.

In Kenya, Graham *et al.*, 2013 reported that male sex workers face social, cultural and religious intolerance that may affect their treatment adherence. This study recommended the need for close and continuous monitoring of adherence to ART among MSW to support interventions. Despite the well-understood significance of male sex workers in the management and control of the HIV epidemic in Kenya (Gelmon *et al.,* 2009), there is limited scientific enquiry on factors that affect their adherence to ART that can support population-focused interventions to improve retention to care and adherence to medications.

This study therefore aimed at establishing the proportions of male sex workers living with HIV who adhere to ART and determine the factors that facilitate or impede their adherence levels. The study defined MSW as "men who exchange sex for money or items of value with other men" (MOPHS, 2010). The results of this study will be disseminated to policy makers and programme managers to contribute to the design of ART adherence enhancing interventions targeting male sex workers.

1.2 Statement of the Problem

Kenya has an estimated 22,000 men who have sex with men and male sex workers with a HIV prevalence of 18.2%, thrice that of the general population of 6.1% (NACC, 2016). Male to male sexual behaviour is recognised as a primary risk factor for HIV transmission in Kenya. Previous studies show that 12% of male sex workers are married to a female partner (Geibel, 2008).Overall, men who have sex with men including male sex workers contribute approximately 15.2% of new HIV infections (Gelmon *et al.,* 2009). Prevention and control of HIV transmission among this population is therefore important at an individual and public health levels of HIV control.

Adherence to Highly Active Antiretroviral Therapy (HAART) is important for its dual role of preventing risk of HIV transmission and AIDS related deaths. In Kenya, male sex workers living with HIV were found to have the lowest overall adherence to ART and poor treatment outcomes compared to women and other heterosexual men in the same treatment sites (Graham *et.al,* 2013). The health care system and service delivery is a great influence on patient adherence or non-adherence to long term treatment (WHO, 2003). Among male sex workers in Kenya, factors such as difficulties in locating a health provider who is trained to address their unique needs and fear of being reported to legal authorities are some of the identified barriers to seeking health services (Onyango *et al.,* 2006).

This study therefore aimed to generate strategic information on existing gaps on adherence to ART among male sex workers. The findings will be disseminated to policy makers and technical programme managers to draw attention to the need for

targeted interventions on ART adherence to benefit MSW living with HIV, health systems and the public at large.

1.3 Justification of the Research

Nairobi City County has the highest (163, 287) number of people living with HIV as compared to the rest of the 46 County Governments of Kenya (NACC, 2016). In addition, the County has the highest (1,570) number of male sex workers in Kenya (MOH 2012). The significantly high (41%) HIV prevalence among MSWs who report having sex with only male partners (Sanders, 2007) shows the importance of developing targeted interventions for this population.

This study on ART adherence among male sex workers in Nairobi County is timely. First, the emphasis on ART treatment adherence has received global attention following the issuance of the 2016 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV Infection by the World Health Organization (WHO, 2016). These guidelines made a major shift where all individuals with confirmed HIV infection are considered eligible for ART, irrespective of disease status measured through their CD4 cell levels (MOH, 2016).

Secondly, despite the importance of MSW in the concentration of HIV epidemic and as a bridge population to the general population, they received less attention compared to their less stigmatized counterparts, female sex workers (NASCOP, 2013).

Thirdly, this study responds to specific recommendations by Graham *et al.*, 2013, on the need for studies on the problem of ART adherence among male sex workers in Kenya noting the limited scientific inquiry on ART adherence among MSW. The findings of this study will therefore provide information that can be used to design targeted interventions on adherence among male sex workers.

1.4 Research Questions

1. What is the proportion of MSW in Nairobi City County, Kenya who self–report adherence to ART?
2. Which factors are associated with self-reported adherence to ART among MS Win Nairobi City County, Kenya?
3. What are the perceived barriers of adherence to ART among MS Win Nairobi City County, Kenya?

1.5 Study Objectives

1.5.1 General Objective

To determine factors that influence adherence to ART among male sex workers in Nairobi City County, Kenya.

1.5.2 Specific Objectives

1. To assess the proportion of male sex workers in Nairobi City County, Kenya who adhere to ART.
2. To determine the factors associated with self-reported adherence to ART among male sex workers in Nairobi City County, Kenya.
3. To establish perceived barriers of adherence to ART and their influence on self-reported adherence among male sex workers Nairobi City County, Kenya.

1.6 Conceptual Framework for Adherence to Treatment

The conceptual framework for this study was adopted from the World Health Organisation multi-dimensional adherence model which defines adherence as a phenomenon determined by the interplay of five sets of factors. These include; socio economic, patient related, health condition, health care systems, and treatment related factors (WHO, 2003).

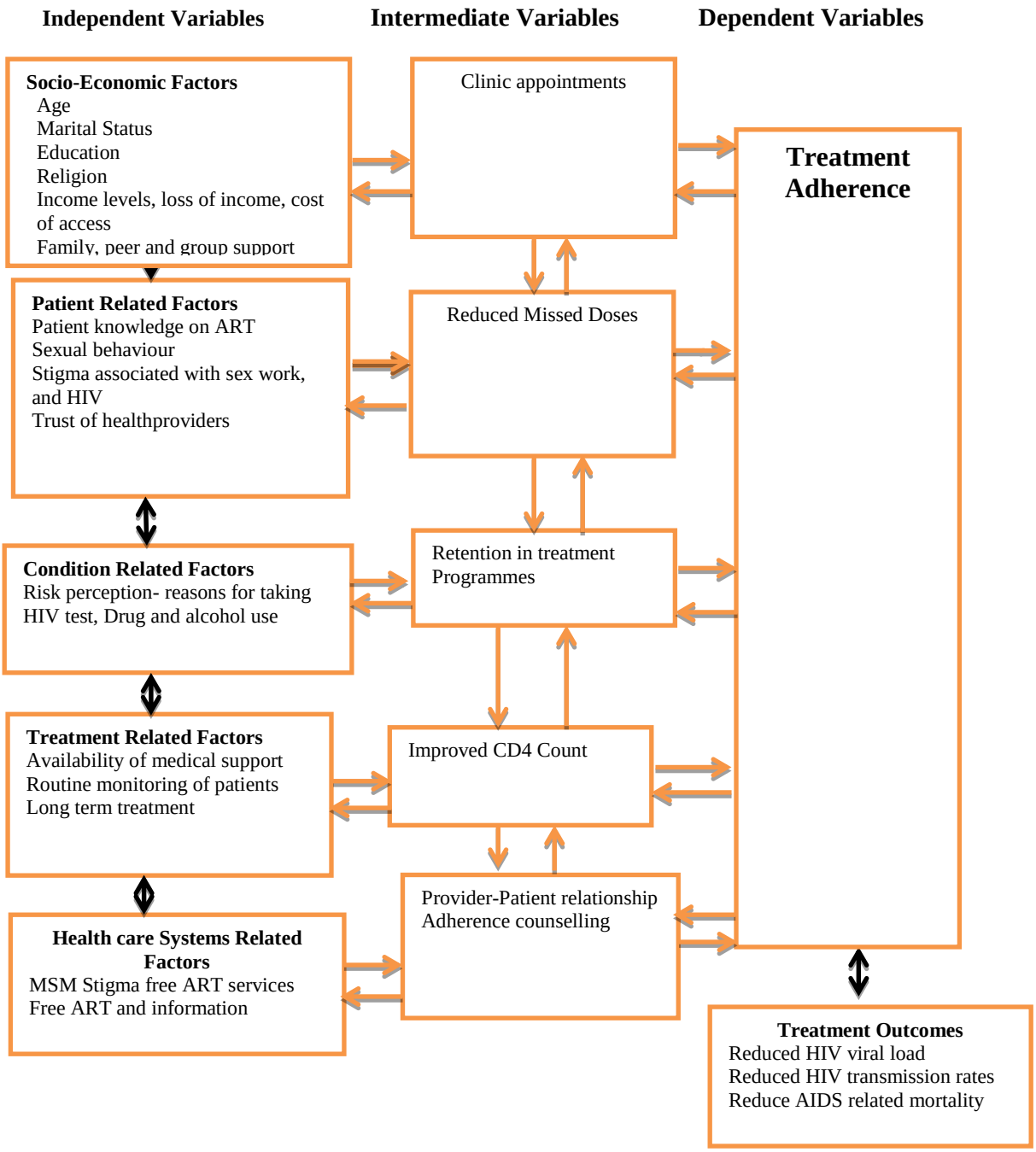

Figure 1.1: Conceptual Framework for Adherence to Treatment (Adopted from WHO, 2003)

CHAPTER TWO

LITERATURE REVIEW

2.1 Global Perspective: HIV, Antiretroviral Therapy and Male Sex work

The HIV and AIDS pandemic remain one of the most serious challenges to global public health three decades since the first cases were diagnosed. In 2016, UNAIDS reported an estimated 36.7 million people globally were living with HIV, 2.1 million people became newly infected with HIV and, sadly, 1.1 million people died from AIDS-related illnesses. The Global response to the pandemic was evidently succeeding with around 17 million people living with HIV who were on ART by the end of 2015 compared to 7.5 million in 2010 (UNAIDS, 2016).

The contribution of MSW to the global AIDS epidemic is well understood. Sex workers are among populations significantly affected by the AIDS epidemic globally. HIV prevalence among sex workers is 12 times higher than that of adult population (UNAIDS, 2014). Men who have sex with men are defined as "those males who have sex with males, regardless of whether or not they have sex with women or have a personal or social gay or bisexual identity (UNAIDS, 2011). UNAIDS (2006) estimates that MSM/MSW account for about 5-10% of the global burden of HIV and are 19.3 times more likely to be HIV-infected than the general population with considerable variation between countries and regions (Baral et al., 2007).

Treatment of HIV consists of a combination of at least three drugs of Highly Active Antiretroviral Therapy (HAART) to suppress HIV replication, and the success of this therapy is largely dependent on patients' adherence. The use of ART has demonstrated remarkable success in inhibiting HIV viral replication and reducing morbidity, mortality, and overall health care costs for HIV-positive persons (Crum *et al.,* 2006; Mocroft *et al.,* 2003). Several multi-country studies have explored the potential use of ART to prevent HIV infections among MSM. One of the studies, the global iPrEx study, which enrolled 2,500 MSM, showed that daily use of a pre-exposure prophylaxis (PrEP) could reduce the risk of sexual transmission of HIV by

44% (Grant *et al.,* 2010). In this study too, efficacy was shown to be closely related to adherence.

The World Health Organization (WHO) argued that there are more health benefits of improving adherence to existing treatments worldwide than could be achieved by development of new regimens (WHO, 2003). In 2016, global guidance on treatment of HIV was issued by the World Health Organization on the use of ART for treating and preventing infections. The success of the new paradigm shifts informed by evidence of better health outcomes of early ART initiation regardless of health status will largely depend on patients' long-term adherence to suppressive ART treatment (WHO, 2016). Previous observational studies that established the role of ART in reducing HIV transmission failed to confidently support the idea that the role of ART in HIV risk reduction could be found in all populations on ART (Dukers *et al.,* 2001; Jina *et al.,* 2010). These studies argued that such benefits depended on the levels of adherence to ART. These results were attributed to patients achieving suppressed viral loads at all times.

Ensuring strict adherence to suppressive antiretroviral regimens for long-term outcome for the patients on ART remains a formidable challenge (Nachega *et al.,* 2010). Reports have shown high levels of patients' attrition from antiretroviral programmes, as high as 35% at three years (Rosen *et al.,* 2007; Fox *et al.,* 2010). Non-adherence to ART compounded with poor retention of those who have enrolled in treatment programmes is an issue largely attributed to increased HIV burden, new HIV infections and funding constraints posed by other health priorities (Hortsmann *et al.,* 2010; Giordano *et al.,* 2007; Mugavero *et al.,* 2010).

2.2 Perspective of HIV, Antiretroviral Therapy and Male Sex work in Africa

Sub-Saharan Africa is the world's most affected region by the HIV epidemic and accounts for more than half (53%) of all people living with HIV globally (UNAIDS, 2017). Three out of every four people living with HIV in this region are on ART. Treatment coverage in this region increased from 24% in 2010 to 54% in 2015, reaching a total of 10.3 million people.

South Africa has the highest number of people living with HIV in the world (7.1 million) while Swaziland has the highest prevalence at 27.2 per cent (UNAIDS, 2016). The average retention in ART programs in sub-Saharan Africa 3 years after initiating patients on treatment is 70% (Rosen et al., 2007).

The population of sex workers and men who have sex with men are disproportionately affected by HIV in Sub-Saharan Africa. These populations are also known to suffer from stigma and discrimination, but remained neglected by many HIV prevention and care programs (UNAIDS, 2010). Studies show that HIV programs for men who have sex with men MSM/MSW only became a focus in this region two decades after the global response to the AIDS epidemic (Smith, 2009; Beyrer, 2010; WHO, 2011) . In most African countries MSM/MSW are highly stigmatized by prevailing attitudes and laws against adult same-sex behaviour (Fay, 2011) and are often reluctant to access care. Groups with multiple sources of stigma such as men who have sex with men, sex workers and people who inject drugs may have fewer health care options, which may hinder consistent adherence to long term medications (Cohen &Karen, 2008).

The importance of MSM/MSW in the AIDS epidemic in Africa stems from their sexual behaviours where many report frequent bi-sexual and concurrent relationships. Despite the relative small numbers of MSM compared to heterosexual transmission of HIV, many MSM/MSW are married to, or in a long-term relationship with a woman and some do this to conceal their true sexual orientation (Beyrer et al., 2010).

2.3 Perspective of HIV, Antiretroviral Therapy and Male Sex work in Kenya

There were approximately 1.6 million people in Kenya living with HIV by the end of 2015 (NACC, 2016). Earlier reports indicated that the HIV epidemic in Kenya was among the most severe in the world. AIDS was ranked the leading cause of death responsible for an estimated 144,000 deaths or 38 per cent of the overall country mortality (WHO, 2006). Previous reports show HIV prevalence in Kenya peaked at 10.5% in 1995, declined by about 40% to 6.7 per cent in 2003 and remained relatively stable at 6.0% by the end of 2011. The decline of HIV prevalence from

1995 to 2003 is partly attributed to high AIDS related mortality while the stabilization of the epidemic in the last decade is largely due to the rapid scale up of ART and reduction in the number of new infections that occurred during this period (NACC, 2013).

The pattern of HIV epidemic in Kenya is generalized among the general population with significant gender differences. In addition, populations such as female sex workers and their clients, MSM/MSW and people who inject drugs are considered to be at a heightened risk of HIV acquisition and transmission (Gelmon *et al.*, 2009). More recent studies showed that prevalence among sex workers had declined over time in some regions and cities. For example, in Nairobi, it is reported that HIV acquisition among sex workers had declined by more than four-fold between 1985 and 2005 (NACC & NASCOP, 2012).

Kenya's ART programme has rapidly scaled up in recent years. The number of people living with HIV on treatment increased by 40% from 656,359 in 2013 to 897,644 in 2015 (NACC, 2016). The overall goal of the programme is to ensure at least 90 percent of the patients are retained in the treatment and care programme and achieve viral suppression (MOH, 2014). The Kenya ART programme utilizes integrated and decentralised HIV delivery models that increase access to care and treatment at community and other non-ART service points. The programme aims at enhancing treatment literacy, patient empowerment, psychosocial, adherence support and disclosure interventions (MOH, 2016) in order to avert AIDS related deaths and prevent new HIV infections.

Sex between men occurs in every culture and society, although its extent and public acknowledgement varies from region to region. Kenya estimates that over 30% of new HIV infections are attributed to transmissions occurring among key populations who include men who have sex with men/male sex workers, female sex workers, people who inject drugs and prison populations (Gelmon *et al.*, 2009).In 2013, a national estimate reported that consolidated findings from various size estimation exercises indicated that there were approximately 22,000 MSMs with a HIV prevalence of 18.2 per cent in Kenya. The report noted that 67.8 per cent of study

respondents who participated in a geographic mapping exercise across the study sites were male sex workers. In Nairobi, almost all the respondents (95.2%) were identified as male sex workers (MOH, 2012). The complexity of male sex working Kenya stems from the fact that many have both male and female clients. Earlier studies showed that 12% of male sex workers reported either being married to or living with a woman (Geibel, 2008). In other surveys, majority (60%) had sex with both men and women. MSW who reported having sex with only male partners, had a HIV prevalence of 41 per cent compared to 24.6 per cent among those with both male and female partners (Sanders, 2007).

Kenya criminalises same-sex sexual activity and sex work making it difficult to implement HIV prevention and treatment programmes for this group. Section 162 of the Penal Code states that *'any person who has carnal knowledge of any person against the order of nature; or permits a male person to have carnal knowledge of him... is guilty of a felony and is liable to imprisonment of 14 years'*. Additionally, section 165 specifies that any *'male person who... procures another male person to commit any act of gross indecency with him or attempts to procure the commission of any such act by any male person... is guilty of a felony...'*. (Government of Kenya, 2008).Sex work in Kenya is therefore practiced in a legally constricting environment. The Penal Code defines two types of offences with respect to sex work, namely, *"living off the earnings of prostitution"* and *"soliciting or importuning for immoral purposes"*. Thus, the Penal Code criminalizes third parties who benefit from sex work and prohibit promotion of prostitution (FIDA, 2008).

The legal constrictions around sex work add to the complexity of male sex work. A study conducted in Nairobi confirmed that on one hand, majority of MSMs/MSW interviewed had difficulties in locating health providers who were trained to address their unique needs. On the hand, health providers did not find it easy to provide non-stigmatising services to clients such as MSMs/MSW perceived to be practicing illegal behaviour. The situation was further compounded by the fact that the MSMs avoided seeking health services out of fear that they would be reported to legal authorities (Onyango *et al.*, 2006).Most HIV prevention, care, and support for this group primarily address male sex work as a sub-set of men who have sex with men.

Notably, MSW are more likely to experience criminalization and the double stigma associated with male to male sex and sex work. This situation compromises access to health services (Onyango *et al*., 2006).

Male Sex workers in Kenya are reported to experience high levels of physical and sexual violence. In one of the earlier studies, 39 percent of MSW surveyed in Nairobi City County, reported experiencing violence a year preceding the survey (Onyango, 2005). Other studies also established that MSW often experience violence from their clients and police. These instances included cases of harassment, physical violence and rape. Male sex workers in other parts of Kenya too have been reported to experience violence. In Mombasa County, Kenya, over 12 percent of MSWs reported having experienced physical abuse at least one year prior to the study, while 9.9 percent had been sexually assaulted or raped. Instances of police harassment, arbitrary arrests for loitering and extortion of money or sexual services were also reported (Okal, 2011).

2.4 The Importance of Adherence to Antiretroviral Therapy

Treatment adherence in management and control of HIV is critical due to alarming negative consequences of non-adherence. It is well acknowledged that even episodic non-adherence to antiretroviral therapy can lead to viral mutations and drug resistance. The success of ART is closely linked with patient adherence levels where decrease in adherence leads to increase in viral load and the risk of progression to AIDS. Other consequences of non-adherence include likelihood of generating drug-resistant strains of HIV and that of infecting others (Paterson *et al.,* 2000; Brenner *et al.*, 2000; Quinn *et al.*, 2000; Bangsberg*et al.,* 2001). Evidently, patient adherence to HIV care is essential for realization of the full benefits of ART and nearly perfect adherence levels of 95% is required for patients to achieve and sustain viral suppression, maintain immune health, and slow disease progression (Hortsmann *et al.*, 2010; Marks *et al.*, 2010).

The benefits of perfect adherence to ART have been strengthened through evidence of markedly reduction risk of HIV sexual transmission from an HIV-infected to the HIV negative partner in a sero-discordant relationship (Cohen *et al.*, 2011). This

study led to global shifts towards early initiation to ART for dual health outcomes of saving lives and reducing transmission rates. Further studies (Curran *et al.,* 2014) established that people living with HIV were willing to initiate ART earlier for the sake of maintaining good health, avoiding opportunistic infections, and protecting children and HIV-uninfected partners from being infected.

Adherence to HIV care is a concept that includes attendance at appointments and adherence to treatment regimens. These two components have been shown to have independent associations with long-term healthcare outcomes. Studies have shown more than 10% of patients taking ART report missing one or more doses of medications per day, and < 33% report missing doses over a 2- to 4-week period (Marks *et al.,* 2010). Clinic attendance is a proxy indicator of retention in care which enhances adherence to ART. Optimal adherence to ART has also been shown to depend on individual and group contextual factors. Groups with multiple sources of stigma such as men who have sex with men, sex workers and injecting drug users are reported to have fewer health care options which may hinder consistent high treatment adherence (Cohen and Karen, 2008). In other studies MSM/MSW had lower levels of ART adherence and poor weight gain during treatment compared to other heterosexual men and women in similar treatment sites (Graham *et al.*, 2013).

2.5 Measurement of Treatment Adherence

Treatment adherence is a complex issue and multi-dimensional approaches are required to both address the constraints and strengthen the key facilitators of adherence (WHO, 2003). In ART monitoring, patients are classified as adherent if they are able to take at least 95% of the prescribed drugs in a given regimen. This cut off is based on the confirmation that in excess of 95% adherence to medication is required for adequate virological and immunological response (Paterson *et al.*, 2000). Efforts to determine the level of adherence among patients on ART is complicated by the general methodological difficulties of adherence assessment. There is no gold standard of measuring treatment adherence. The use of more than one measure is recommended to improve accuracy (Vitolins *et al.*, 2000). Measurements of treatment adherence are also noted to be sensitive to local settings.

The International Network for the Rational Use of Drugs Initiative on Adherence to Antiretroviral Therapy (INRUD–IAA) concluded that in resource -poor settings, self-reports in clinic records offered feasible approaches to standardized measures of adherence while use of pill counts was less appropriate (Chalker *et al.,* 2010). In other studies (Gill, 2005), physicians and self-assessment were ranked least accurate measures of adherence while Haberer *et al.,* 2010 recommended the use of real-time adherence monitoring as a feasible and acceptable strategy to proactively prevent rather than reactively respond to virologic treatment failure. One of the key limitations of use of self-reports in measuring adherence to treatment is that they reflect only short-term or average adherence rates and may often overestimate adherence patterns compared to pill counts or electronic measurements (Melbourne *et al.,*1998; Hales *et al.,* 1988). Patient recall bias as well as social desirability is also a recognised limitation of self-reports of adherence (Chesney *et al.,* 2000; Kennedy *et al.,* 2004).

In HIV treatment settings, the rates of adherence based on self-reported measures have been found to be consistent with those established through other measures. Patients' self-assessments of adherence through interviews or self-administered questionnaires show significant correlation with viral load tests. In other studies, pharmacy refill adherence assessments were as accurate as CD4 counts for detecting current virologic failure in ART patients (Bisson *et al.,* 2008). Lui *et al.,* 2001 examined the relationship between results derived through multiple measures of adherence to ART and HIV virologic response of patients. The study established that Composite Adherence Score (CAS) showed the strongest predictive relationship compared to Medication Event Monitoring System (MEMS), pill count, and interview. However the mean antiretroviral adherence differed by adherence measure (MEMS, 0.63; pill count, 0.83; interview, 0.93; and CAS, 0.76).Some earlier studies, however, showed significant relationship between data from self-reports and viral load which validates the use self -reports as a measure that can help to determine adherence to ART (Hecht *et al.,*1988; Niewkerk *et al.,*1998).

In other settings, self-reported adherence measures have been predictive of adherence to cardiovascular medications and blood pressure control. These studies used validated, 4-item questions (Shalansky *et al.,* 2004; Morisky *et al.,* 1986). Other studies in the same field found patient self-report of medication non-adherence was strongly associated with adverse cardiac events, including coronary heart disease death, myocardial infarction, and stroke among patients with known coronary artery disease. These results were established on the basis of a single screening question ("In the past month, how often did you take your medications as the doctor prescribed?") (Gehi *et al.,* 2007*).*

Another adherence measurement approach is to ask providers to estimate patient adherence rates. However, these estimates are found to be over-optimistic. They rely on patient self-reports of adherence which tend to be exaggerated probably due to recall bias or patient desire to please the provider and avoid criticism (Gao, 2000*).* For example in a study to predict compliance with a regimen of digoxin therapy in family practice, the 10 physicians were unable to predict compliance better than chance, even for the 58 patients they had known for 5 or more years (Gilbert 1980). Health care providers attitudes and belief that adherence is more likely to be influenced by patient socio and economic factors rather than treatment and health factors may tend to limit their ability to correctly predict adherence rates. However, predictors of adherence vary greatly across populations and settings and no one factor has been consistently associated with non-adherence across all studies (Chesney, 2000).

2.6 Proportions of Anti-Retroviral Therapy Adherent Population

Ability of a patient to keep to the pattern of taking their ARVs is defined as 100% adherence, while ≥ 95% adherence is accepted as optimal adherence. A level of adherence below 95% is considered sub-optimal (Attia *et al.,* 2009; Quinn *et al.,* 2000). Estimates of average rates of non-adherence to antiretroviral therapy range from 50% to 70%, with adherence rates of less than 80% associated with detectable viremia in a majority of patients (Chesney, 2000). In two earlier studies conducted in the United States involving 235 and 244 HIV positive patients, only 46% and 40%

were rated adherent against an arbitrary optimal adherence rate cut off at 80% (Gir *et al.,* 1998; Eldred *et al.,* 1998).A 2011 meta-analysis, which pooled ART adherence of 33,199 adults in 84 observational studies, established that only 62% of individuals took at least 90% of their prescribed ART doses. Studies with higher proportions MSMs had more individuals maintaining ≥90% adherence as compared to those of people who inject drugs (Ortego, 2011).In South India, mean adherence rates of 91.25% were found among 63.7% of HIV positive patients (Basavaprabhu *et al.,* 2013).

In Kenya, a national survey which included a self-assessment of adherence confirmed a correlation between self-reports on adherence and viral suppression. The study established that three quarters (75%) of HIV-infected persons on ART achieved viral suppression with those reporting not missing an ART dose 30 days preceding the survey recording higher (78%) viral suppression compared to 57.9% among those who reported they had missed taking a pill (non-adherent) in the same period (MOH, 2012).

2.6 Factors that influence Adherence to Antiretroviral Therapy

There is a large body of research exploring the problem of adherence to ART. The literature is however dominated by reports identifying factors that are predictive or associated with ART adherence among patients in the general population (Howard *et al.,* 2002; Ickovics &Meade 2002; Amico *et al.,*2006; Haberer *et al.,* 2010; Boateng *et al.,* 2013; Peltzer and Pengpid 2013). The paucity of evidence on challenges of ART adherence among populations disproportionately affected by HIV is documented (Krisda *et. al* 2014).

According to the World Health Organization, adherence is a multidimensional phenomenon determined by the interplay of five sets of factors. These include; Socio-economic factors; patient-related factors such as acceptance, knowledge and attitudes, attendance to follow up appointments, risk perceptions and expectations; Health care team and systems factors which include patient-provider relationship, trained providers to provide education and availability of drugs; Disease or condition related factors such as patient risk perception, co-morbidities such as alcohol and

drug abuse and illnesses demand to patients. Treatment related factors include the duration of treatment, experience of side effects, availability of medical support and complexity of the treatment regimen (WHO, 2003).

Social and Economic Factors

In some studies, socio-demographic characteristics such as age and race are observed to influence adherence to ART (Hightow–Weidman, 2011). In other studies, individual factors such as literacy levels, emotional and psycho-social factors, social support and socioeconomic status have been confirmed to influence adherence. Patient knowledge of ART has been identified as a key factor that influences adherence. In a study, conducted with the general population in South Africa, poor knowledge of HIV and ART was attributed to poor adherence (Terblanche and Stellenberg, 2014). Similarly, a study conducted to establish cause of non-adherence to ART in Togo showed that only 55 % of the HIV-infected patients were aware of the names of their prescribed ART medication (Potcho *et al.,* 2010). In Ghana, women living with HIV who had inadequate knowledge on ART were more likely to default from prevention of mother to child transmission care. In this study, over 90% of the women had low ART knowledge (Boateng et al., 2013). Another study conducted in Ethiopia to establish association of knowledge on ART plan, regimen and adherence found those who were knowledgeable more likely to be adherent than those who were not (Demessie et al., 2014).

Patient-Related Factors

Patient-related factors such as sexual behaviour have remained a critical component of treatment programmes. Previous studies confirmed that sustained adherence and continuity of ART - the basic conditions for treatment as prevention (TasP) - remain a major challenge in Sub-Saharan countries where access to treatment is constrained by economic and structural barriers (Dunkle *et al*, 2008). Results of meta-analyses conducted both in high- and low-resource settings (Crepaz *et al*, 2004) concluded that while ART-treated patients do not exhibit increased sexual risk behaviors, unprotected sex remains highly prevalent in Sub-Saharan African patients including, viremic patients, with similar findings established by Wandera *et al.,* in 2011. Few

studies however have used longitudinal data to describe sexual behaviors during the course of ART or to assess the temporal relationship between psychosocial factors such as ART adherence and sexual behaviors (Laurent *et al.,* 2011).

HIV co-morbidities such as excessive alcohol use, drug abuse and other illnesses demands were found to affect adherence to ART among MSW (Hendershot *et al.,* 2009; Malta *et al.,* 2010; Ferro *et al.,* 2015). The relationship between alcohol and depressive symptoms has been documented in other studies where adherence to treatment of drug dependency is compromised (Hasin *et al.,* 2005; Kessler *et al.,* 2005).

In other studies, alcohol use disorders (AUDs) and other substance use disorders (SUDs) were associated with risky sexual behaviours (Hendershot *et al.,* 2009; Malta *et al.,* 2010) which may affect treatment adherence. Disclosure of one's HIV status was found not to influence adherence to ART among sex workers by Sanon *et al.,* 2002. In this study, adherence to ART among marginalized women, without social networks was similar to those who had family and social support.

Treatment- Related Factors

Antiretroviral therapy is described as one of the most rigorous, demanding, and unforgiving treatment ever prescribed. Use of ART requires adherence to a complex dosing schedule that frequently interferes with many aspects of patients' lives such as waking, sleeping hours and eating patterns to match the ART schedule (Rabkin & Chesney, 1999). Health literacy is also known to affect adherence to treatment (Ngoh, 2009) Stone *et al.* (2001) established that patient poor understanding of medication regimens was correlated with increasing regimen complexity (Paterson *et al.*, 2000).

Health Care-Related Factors

Patient-provider relationships, which include communication and time spent explaining the diseases, are found to influence adherence to treatment. The waiting time at appointments or medications refill, convenience of the pharmacy and clinic,

and treatment regimen factors such as pill burden, regimen complexity, side effects, duration of needed treatment, and dosing schedule also affect adherence (Ickovics and Meisler 1997; Balint and O'Donnell 2007; Gerald *et al.,* 2007; Mai and Eng 2007; Misra and Ganda 2007; O'Shea *et al.,* 2007). Poor treatment by health care providers has been found to negatively impact on health seeking behaviour of MSM/MSW. Lane *et al.,* 2008 found that MSM presenting for rectal sexually transmitted infections were particularly vulnerable to such treatment, because rectal STIs were evidence that men had engaged in a particularly taboo sexual behavior, and confirmed popular stereotypes of MSM as promiscuous vectors of disease. Respondents in this study described how their sexual health seeking strategies were built around avoiding health care workers who were likely to harass them. Identifying such workers was said to be a difficult process of trial and error.

2.7 Barriers to adherence to Antiretroviral Therapy

Several barriers to adherence to ART have been established. Food insecurity emerged as one of the most significant barriers to antiretroviral adherence in a study conducted in Uganda in 2009. The study established that 39% (14 out of the 36 patients) on ARVs were food insecure, which impacted on adherence to ART. The study recommended the need to address food insecurity as part of ART programs to promote adherence (Weiser *et al.,* 2009).Stigma, discrimination and social isolation are also documented as barriers to ART adherence among criminalized groups such as MSM/MSW (Lane *et al.,* 2008; Sharma *et al.,* 2008).Evidence suggests that MSM/MSW have poor access to HIV testing and prevention services, compared to other populations. This was attributed to fear of health-care seeking, denial of care, and even blackmail (Fay *et al.,* 2011; Lane *et al.,* 2008). Other studies also support that issues like HIV-related stigma and lack of social support contribute to non-adherence to ART.

Another common barrier to adherence reported is patients' forgetfulness to take their medications (Chesney *et al.,* 2000; Turner, 2002). In another study conducted in South India in 2013 the patient barriers to treatment adherence were identified as financial constraints, forgetting to take medication, lack of family care, depression,

alcohol use, social stigma and side effects to antiretroviral therapy (Basavaprabhu *et al.,* 2013). Other reasons include experience of undesirable side effects of HIV medications such nausea, vomiting, diarrhea, and fatigue, as well as longer term effects including oral numbness, persistent metallic taste, cardiovascular problems, lipid redistribution, and neuropathy (Chesney *et al.,* 2000). In 2001, Stone found patients who experience more than two aversive reactions are less likely to continue their treatment. The extent to which side-effects alter a patient's motivation to adhere to a treatment regimen depends greatly on the specific contextual issues surrounding the individual. The literature on side-effects clearly shows that optimal adherence occurs with medications that remove symptoms, whereas adherence is reduced by medications that produce side-effects. Antiretroviral therapy is known to cause temporary side-effects including transient reactions (diarrhea and nausea) as well as longer-lasting effects (i.e. lipodystrophy and neuropathy) (Chesney, 2000). Furthermore, although HAART may greatly increase quality of life in symptomatic individuals, it probably has a negative effect on quality of life in asymptomatic individuals (Niewkerk *et al.,* 1998). Curran *et al.* (2014) reported in a study conducted among sero-discordant couples in Kenya that a widespread perception that ART initiation signified the final stage before death was a key barrier to uptake and adherence.

Other structural barriers to adherence include violence targeted to some groups. According to WHO (2011), sex workers are more vulnerable to violence through their working conditions or by compromised access to services. Some may have little control over the conditions of sexual transactions (e.g. fees, clients, types of sexual services) if these are determined by a manager. The availability of drugs and alcohol in sex work establishments increases the likelihood of people becoming violent towards sex workers working there. Sex workers who consume alcohol or drugs may not be able to assess situations that are not safe for them. Violence or fear of violence may prevent sex workers from accessing harm reduction, HIV prevention, treatment and care, health and other social services as well as services aimed at preventing and responding to violence (e.g. legal, health). Police arrest has also been documented as a structural barrier of adherence to ART among people who inject drugs (Mathew *et al.,* 2010).

2.8 Treatment Adherence Enhancing Interventions:

It is well recognised that the challenges of adhering to ART are attributed to changes required in many aspects of patients' lives. Most patients report making adjustments in their normal routines to match their ART schedules (Chesney *et al.,* 2000). It is based on such complexities that achieving high levels of adherence to ART are uncommon. A number of interventions such as patient education, case management, modified directly observed therapy (mDOT), and conditional economic incentives have been widely implemented to promote adherence to ART (Simoni *et al.,* 2008).

Comprehensive interventions combining cognitive, behavioural, and motivational components were found more effective than single-focus intervention such as those aimed at providing education to increase knowledge only. Such interventions were not found to adequately improve adherence to medication *(*Roter *et al.,* 1998*).* Other similar studies also established that the most effective adherence interventions are those that address multiple barriers of adherence (Singh, 1999; Murphy et al., 2001). The 2013 World Health Organisation consolidated guidelines of drugs for treating and preventing HIV infection highlighted a number of adherence-enhancing interventions. One of the interventions recommended was the use of mobile phone text messages as a reminder tool for promoting adherence to ART as part of a package of adherence interventions. In other studies, cognitive-behavioural therapy, followed by education, treatment supporters, direct observed therapy, and active reminder devices were found to be most effective adherence interventions. The less commonly tested intervention types included structural interventions such as changes in the person delivering ART, or in the location where ART were provided counselling, nutritional support, financial incentives, passive reminder devices and drug use treatment (Krisda *et al.,* 2014).

Group interventions may be successful in improving adherence and clinical outcomes (Marcia *et al*., 2012) as evident by a multi-component intervention that included support groups and group health education which showed higher adherence and significantly improved CD4 counts and viral loads at 24 weeks for women in the intervention compared to those in standard care in Nigeria (Abah, 2006). According

to WHO, men who have sex with men and transgender people with harmful alcohol or other substance use should have access to evidence-based psychosocial interventions (WHO *et al.,* 2011).In earlier studies,(Lane *et al.,*2008) recommended that interventions to promote access to adherence among stigmatised groups such as male sex workers should include sensitization training for health care workers on the need to address homophobia to address the sexual health challenges that all same-sex practicing men face.

Evidently, behavioural interventions that are successful in one setting may not be effective in another one with different economic, social and behavioural barriers to adherence and therefore tested and effective adherence-enhancing interventions should be increasingly moved into implementation in routine programme and care settings, accompanied by rigorous evaluation of implementation impact and performance (Krisda *et al.,* 2014). To minimize the risks of non-adherence due to treatment related factors, Sanon *et al.,* 2002 recommended that support systems for adherence should take into account the factors influencing perceptions of the ART drugs to provide specific psychological support during treatment initiation and follow up. Earlier studies by Hedge and Petrak (1998) pointed out that clinicians should screen for mental health disorders and disorders related to psychoactive substance abuse in certain HIV-infected populations that may jeopardize their ability to adhere to treatment.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Site

The study was undertaken in Nairobi City County which is one among the 47 devolved governance units of Kenya. Nairobi City County was founded in 2013 on the same boundaries as Nairobi Province, after Kenya's 8 provinces were sub-divided into 47 counties. The county is also Kenya's capital and largest city. It covers an area of 696 $Km^2$and is bordered by Kiambu County in the Northern metropolitan, Kajiado County to the South and Machakos County to the East (Figure 3.1).

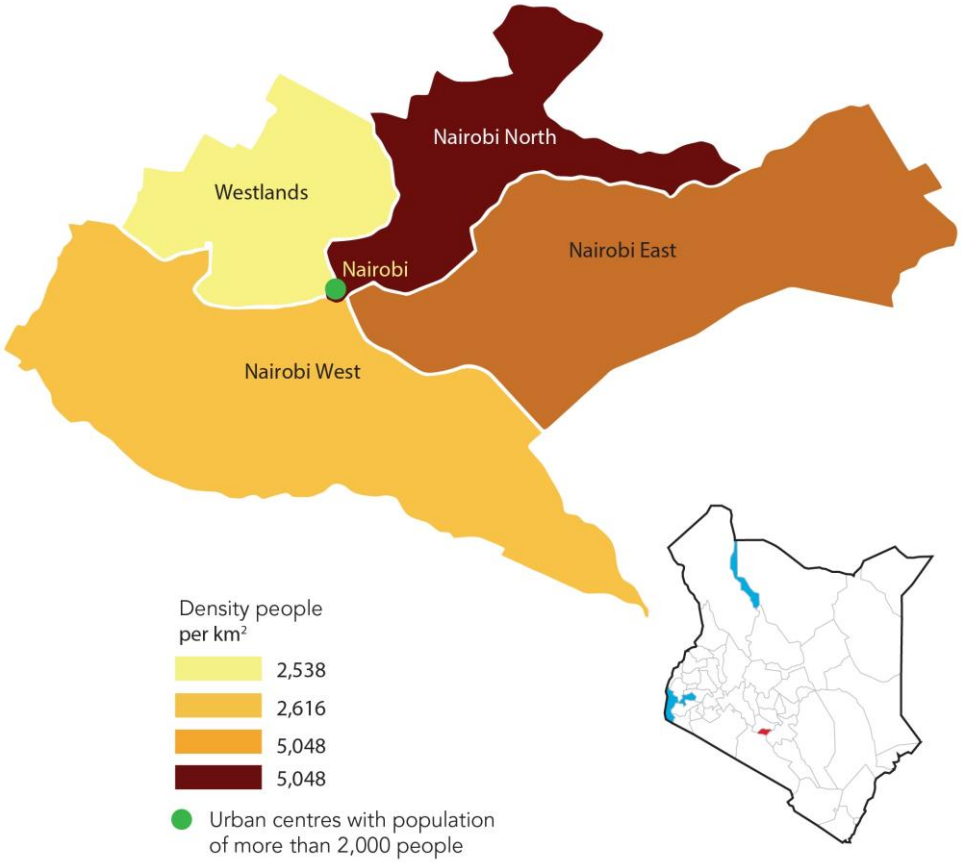

Figure 3.1: Map of Nairobi City County

The County consists of 17 parliamentary constituencies with approximated population of 3,138,396 (KNBS, 2009). It is served by a total of 888 health facilities (MOH, 2011). Nairobi City County has an estimated 163,287 people living with HIV with a prevalence of 6.1 per cent. In 2015, approximately 4,719 new adult HIV infections occurred (NACC, 2016).

3.2 Study Design

This was a cross sectional descriptive study conducted in Nairobi City County Kenya. The study utilized both quantitative and qualitative methodologies. The quantitative approaches were used to obtain data that support numerical representation, comparable analysis and aggregation. Qualitative methods, on the other hand sought to provide in-depth of information on underlying perspectives and factors that influence ART treatment adherence among male sex workers in Nairobi. Respondents were drawn through a community-based organization (CBO) Health Options for Young men with AIDS / STI (HOYMAS), which primarily serves male sex workers and other men who have sex with men.

3.3 Study Variables

Self-reported adherence to ART was assessed as the dependent variable against five categories of independent variables.

3.3.1 Independent Variables

The selection of independent variables was guided by the World Health Organization multi-dimensional adherence model (WHO, 2003). The variables were categorised as follows;

Socio-economic factors: Age, education levels, religious denomination, duration of stay in Nairobi and Income levels.

Patient-related factors: ART knowledge and attitudes, sexual practices, reasons for taking an HIV test (Risk perceptions) and social support.

Health care team and systems factors: Patient provider relationship, Health care team provides adherence education on ART initiation, cost of accessing ARVs and availability of drugs.

Disease or condition related factors: Disclosure, use of alcohol and drug abuse, experience of violence and police arrest based on sexual orientation which may cause depression and affect adherence (Ciechanowski *et al.*, 2000).

3.3.2 Dependent Variable

Self-reported adherence to ART: A composite variable based on measure of adherence to treatment through reports onever missed any appointments at the ARV clinic, missed doses of ARVs, and ever had a drug outcome monitoring test (CD4 count).

3.4 Study Population

The study focused on male sex workers in Nairobi City County, Kenya. In an exercise to determine the size of the population of male sex workers, the Ministry of Health in Kenya established there were about 1,570 male sex workers in Nairobi City County (MOH, 2012). A total of 260 male sex workers on ART, aged 18 years or older who provided written informed consent were interviewed.

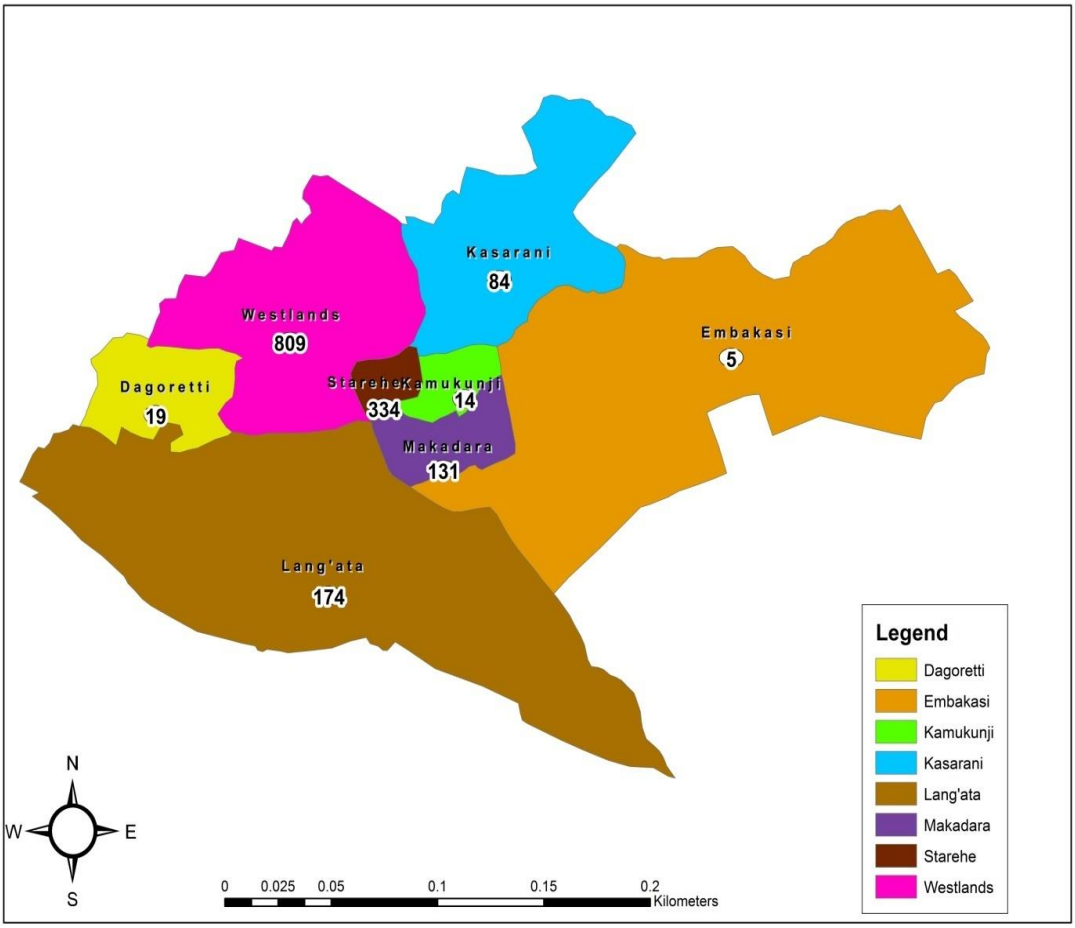

Figure 3.2: Distribution of Male Sex Workers in Nairobi City County by Administrative units (MOH, 2012)

3.2.1 Inclusion Criteria

The eligibility criteria for participants in the study included the following:

i. Male 18 years of age or older living with HIV and on ART
ii. Exchanged sex for money or gifts with another man in the past one month Lived in Resident of Nairobi City County for at least 12 months
iii. Willing to disclose details of ART enrolment
iv. Able to speak and understand Kiswahili and English to provide voluntary informed consent

3.2.2 Exclusion criteria

The exclusion criteria for participants in the study included the following:

i. Inability to consent due to cognitive concerns
ii. Unavailability to participate in a face to face interview
iii. Persons identifying as male gender but biological female male at birth

3.5 Sampling

3.5.1 Quantitative Data Sampling

Recruitment of study respondents utilized Respondent Driven Sampling (RDS), a method found to be effective in enrolling MSMs and other hidden populations typically criminalized and highly stigmatized (Magnani *et al.,* 2005 and Heckathorn *et al.,* 1997). Respondent Driven Sampling utilizes a chain of peer referral process. Successions of recruitment waves are initiated by selected "seeds" who are usually identified by the investigator based on different criteria such as age, socio-economic status, occupation, and network size. The sampling process began with identification of the site frequented by male sex workers (Pal *et al.*, 1999; Thiede *et al.*, 2001). Health Options for Young Men with AIDS/STI (HOYMAS) an organization that provides safe meeting space for more than 1,000 male sex workers from Nairobi City County was selected. Prior to commencing data collection, a list of self –identified male sex workers living with HIV from Nairobi City County registered under HOYMAS was drawn. Recruitment seeds were identified recruited and provided written consent. Recruitment waves were then initiated and enhanced, through a referral process. Each respondent was given three referral coupons to enroll new individuals. This process was repeated until the desired sample size was attained. Upon completion of the interview, participants were compensated for their travel with KES 300 for this purpose.

3.5.2 Qualitative Data Sampling

The Focus group discussion respondents were selected from male sex workers who met the quantitative inclusion of the study based on their role in ART treatment for the members through a snowballing exercise. Key informants were selected after the quantitative data collection and focus group discussions were conducted and 3 sites (Sex workers Option Clinic, LVCT Health and HOYMAS Clinics in Nairobi City County) where the respondents received their ART were established. Key informants were recruited from the ART treatment sites selected based on their knowledge and experience on issues as outlined on a key informant interview guide (Appendix 6).

3.6 Sample Size Determination

The sample size for the quantitative aim of the study was calculated based on a formula to estimate desired size proportion in a single cross-sectional survey. Self-reported ART adherence rates among adult men in the general population was 78.2% based on previous national studies (MOH, 2012).

The formula of sample size determination was;

$n = 1.96^2\ p\ (1-p)\ (DEFF)/d^2$ (Gorstein *et al.*, 2007).

Where;

n = Minimum sample size

p = Proportion of interest

d=Desired level of absolute precision (usually $\pm$5% for estimated proportions of 20%-80%)

DEFF =Estimated design effect (If the prevalence of a particular indicator is similar in each cluster, the *DEFF* will be around one)

P=78.2%, DEFF =1, d=0.05

$n = 1.96^2 \times 0.782(1-0782)\ (1)/0.05^2 = 262$

A minimum sample of 260 respondents was desirable.

3.7 Data Collection

Data was collected after the respondents provided written informed consent upon recruitment to the study. The principal investigator with support of six research assistants formed the data collection team. The research assistants were organized into two teams of three members each. Each of the team was assigned a supervisor who provided an oversight role during data collection for quality assurance.

3.7.1 Training of Research Assistants

The research assistants were trained for two days on data collection and key ethical considerations. After the training, the team was also involved in a pre-test exercise. A meeting was held after the pre-test exercise to provide feedback on the tools and address emerging concerns.

3.7.2 Data Collection and Interview Schedules

The quantitative data was collected through individual self-administered interviews using a semi-structured questionnaire (Appendix 4). The qualitative data was collected through focus group discussions and individual interviews with key informants. A focus group discussion semi-structured guide based on research objectives was used to generate and gather views from respondents (Appendix 5). Three focus group discussions comprising of an average of 12 male sex workers were conducted. At the end of the group discussions, a debriefing session was done to give a general overview of what had been discussed, the problems identified and the possible solutions offered. Twelve key informants with 3 clinicians, 3 pharmacist, 3 counsellors and 3 treatment site managers using a semi-structured interview guide (Appendix 6) were conducted. The interviews were conducted face to face by the Principal Investigator.

3.8 Data Management

Data was recorded in the electronic questionnaires and encrypted. The collected data was transmitted to a remote server over a Secure Hyper Text Transfer Protocol (HTTPS). Exported Comma Separated Values (CSV) files of datasets were

transferred to Stata Software version 12 for analysis. The data was backed up in computer hard drive disk, CD and flash disc stored in a secure cabinet. A back up of these data was done regularly to avoid any loss or tampering. Hard cover books were also used to store any data not in electronic format.

3.9 Data Analysis

3.9.1 Quantitative Data Analysis

The quantitative data was analysed using STATA software version 12, and the magnitude of association between the different variables in relation to adherence to ART was assessed through the chi square test and the Fisher Exact Test where cell values were less than 5.

Self-reporting on adherence to ART was a composite determined using responses based on the following questions: "*Have you ever missed any appointments at the clinic where you get your ARVs? "Have you ever skipped taking your ARVs?", "In the past 30 days, have you missed taking any of your ARV pills?",* and "*Have you ever had a CD4 count test to see if your immune system is working properly?"*(Questionnaire Appendix 4; number 407). Based on the responses, respondents were categorized as adhered and non-adhered. The adhered category are those who negated on the statements while non-adhered had positively responded to having missed or skipped taking ARVs, clinic appointments, and not having a CD4 count done.

Knowledge on ART was assessed based on three variables; whether ART medications cure HIV; patients should stop ART medications when they feel better and ARTs can be used to stop HIV infection following an exposure. These statements were scored one (1) for correct response and zero (0) for incorrect response. A total score of three (3) implied respondents were very knowledgeable; a score of two (2) and one (1) implied some level of knowledge. A total zero (0) score implied respondent did not possess appropriate knowledge on ARVs (Appendix 5; Questionnaire No -301).Attitude of MSW towards ART was assessed based on responses of the following statements; "*it is difficult for HIV patients to take their*

medication daily, and HIV patients have problems complying with their treatment if they lived far from the clinics".

Univariate Analyses: Data was subjected to descriptive statistical and inferential statistical tests. Specifically, percentages and frequencies were generated for all hypothesized correlates of adherence to ART.

Bivariate Analyses: All correlates in the study were cross-tabulated against two groups based on composite variables (adhered and not adhered). Chi-square tests and Fisher's Exact for cell value less than 5 with statistical significance set at $P<0.05$ were conducted. Binary logistic regression model was applied for statistical significant and non-significant correlates with odds ratios corresponding to 95% confidence intervals. Factor analysis based on principal component analysis (PCA), was used to extract most important characteristics among multiple statistically significant of one variable correlation. This was applied to extract four key factors out of 14 statistically significant barriers of adherence to ART.

Multi-variable analyses: A multivariable statistical regression analysis was done to explore the strength of association of factors with self-reported Adherence. The threshold of statistical significance was set at $P< 0.05$ and adjusted Odds Ratio corresponding to 95% confidence intervals were estimated.

3.9.2 Qualitative Data Analysis

The audio recorded data were transcribed and themes identified through a deductive approach. Summary of the content was done through thematic approach. The findings are presented in narrative form and using verbatim as quotes.

3.10 Ethical Considerations

The study was undertaken after approval by Kenyatta National Hospital –University of Nairobi Ethical Review Committee (KNH-UON ERC (Appendix 1). Permission was sought from the treatment sites of SWOP, HOYMAS and LVCT Health. Each respondent was provided with a copy of the explanation of the study (Appendix 2) and the same was read out in both English and Kiswahili before appending their

signature. All respondents signed a written informed consent prior to taking part in the study (Appendix 3). The information collected was handled with confidentiality and used solely for the purpose of the research. Unique identifier codes were used for all respondents. A referral letter (Appendix 7) was provided to respondents who required intervention.

CHAPTER FOUR

RESULTS

4.1 Socio-Demographic Characteristics of Study Population

A total of 260 respondents were interviewed. The mean age of the MSW sampled was 30 years, 133 (44 %) of had secondary education while (60%) were never married. Among those married 12 % were married to a woman while 17% were married to a man and 93 (36 %) had children. 88% were religious with affiliations of Muslim, Catholic and protestant denominations. Results on the socio-demographic characteristics are summarised and presented in Table 4.1.

Table 4.1: Summary of socio-demographic characteristics of Study MSW Nairobi City County Kenya

Socio-demographic characteristics	Category	Frequency (f)	Percentage
Age	Under -25	52	20
	25-29	71	27
	30-34	79	31
	Over 34	57	22
Education level	Primary	44	17
	Secondary	113	44
	Post-Secondary	99	38
Marital status	Never married	157	61
	Married to man	44	17
	Married to woman	31	12
	Deserted/separated	24	9
Religious denomination	Muslim	20	8
	Catholic	92	36
	Protestant	133	52
	Others	12	5

4.2 Determination of Proportion of MSW Self–Reporting Adherence to ART

Self-reported adherence was a composite of 4 adherence indicators; missed clinic appointments, ever skipped taking ARVs, skipped ARVs 30 days before the study and ever had a CD4 count test (Questionnaire Appendix 4; number 407). Based on scores of those who negative and affirmed the statements, the MSW were categorised as adhered and non-adhered. The results showed 104 (40 %) MSW reported self-adhered as compared to 156 (60 %) (N=260) who were not adherent as presented in Figure 4.1.

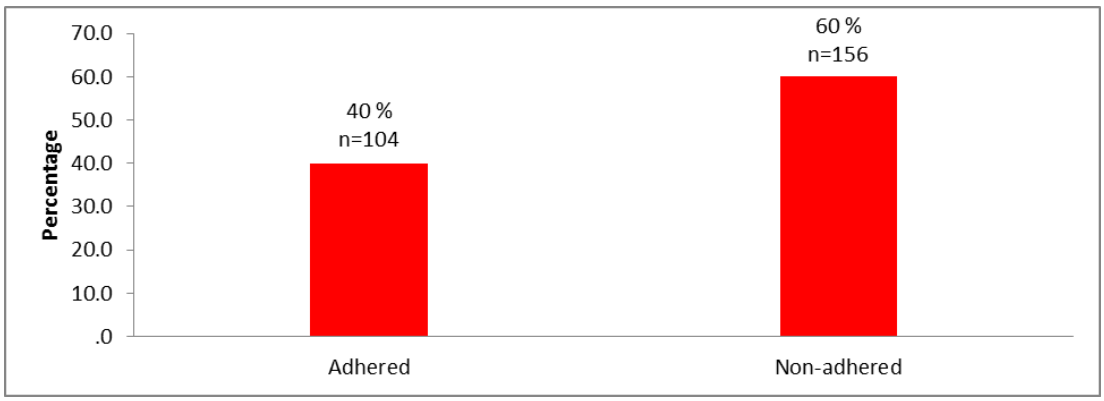

Figure 4.1: Proportion of male sex workers who self-reported adherence to ART in Nairobi City, Kenya

4.3 Factors of Male Sex Workers associated with self-reported adherence

The factors assed for their association with self-reported adherence were grouped into five categories; Socio and economic, patient-related, condition-related, treatment and health care and system related.

4.3.1 Socio and Economic Factors and their Influence on Self- Reported Adherence to ART

Respondents were evenly distributed across the adhered and non-adhered groups with a mean age of 30.2 and a standard deviation of 6.4 for those who adhered and those who did not adhere. None of the social-demographic characteristics was significantly associated with self-reported adherence to ART (Table 4.2).

Table 4.2: Influence of Socio-Demographic Characteristics of MSW on Self-Reported Adherence to ART in Nairobi City,Kenya

	Self- Reported Adherence								
	Yes		No		Total				
	n	%	n	%	n	%	d.f	Chi	P value
Age (n=259)							3	1.621	0.655
19-24 years	17	16.5	35	22.4	52	20.1			
25-29 years	28	27.2	43	27.6	71	27.4			
30-34 years	33	32	46	29.5	79	30.5			
Over 35 years	25	24.3	32	20.5	57	22			
Education level (n=256)							3	0.0292	0.986
Primary	18	17.6	26	16.9	44	17.2			
Secondary	45	44.1	68	44.2	113	44.1			
Post -secondary	39	38.2	60	39	99	38.7			
Marital Status (n=256)							3	2.790	0.425
Never married	60	58.3	97	63.4	157	61.3			
Married to man	16	15.5	28	18.3	44	17.2			
Married to woman	14	13.6	17	11.1	31	12.1			
Separated/divorced	13	12.6	11	7.2	24	9.4			
Duration of Years in Nairobi (n=259)							1	1.434	0.488
1-5yrs	38	37.6	48	30.9	76	30.9			
>5 yrs.	66	63.5	107	69	173	66.8			
Religious Denomination (n=257)							3		0.299*
Muslim	5	4.8	15	9.8	20	7.8			
catholic	41	39.4	51	33.3	92	35.8			
Protestant	55	52.9	78	51	133	51.8			
Other	3	2.9	9	5.9	12	4.7			

*Fisher's Exact Test; df:degrees of freedom

Forty percent of the respondents reported sex work was their main source of income, 44% (115), had a monthly income of more than KES 10,000 while 95% (246) owned a mobile phone. Seventy percent (132) reported they decided to become sex workers due to lack of alternative sources of income. Eighty eight percent (229), reported that they did not incur any costs to access ART while 147(57%) lost income as a result of accessing ART. The main reason for getting into sex work was significantly ($\chi 2$ =5.715, d.f=1 p=0.017) associated with self-reported Adherence. Incurring cost to access ART was also significantly ($\chi 2$ = 10.767, d.f=1, p=0.001) associated with adherence (Table 4.3).

Table 4.3: Influence of occupation, income levels and reason for Sex work on self-reported adherence to ART among MSW Nairobi City County Kenya

	Self-Reported Adherence								
	Yes		No		Total				P
	N	%	n	%	n	%	d.f	Chi sq.	Value
Main source of income (n=249)							3	5.734	0.125
Sex work	34	34.3	67	44.7	101	40.6			
Small business	35	35.4	36	24	71	28.5			
Casual labourer	17	17.2	20	13.3	37	14.9			
Salaried employee	13	13.1	27	18	40	16.1			
Average monthly income (n=260)							3	4.271	0.234
<1000	5	4.8	11	7.1	16	6.2			
1001-5000	19	18.3	34	21.8	53	20.4			
5001-10000	26	25	50	32.1	76	29.2			
>10000	54	51.9	61	39.1	115	44.2			
Main reason sex work (n=188)							2	5.715	0.017
No source of income	60	80	72	63.7	132	70.2			
Other reasons	15	20	41	36.3	56	29.8			
Loss of income as a result of ART clinic (n=260)							1	0.942	0.332
No	49	47.1	64	41	113	43.5			
Yes	55	52.9	92	59	147	56.5			
Incur any other costs to access ART (n=260)									0.001*
No	100	96.2	129	82.7	229	88.1			
Yes	4	3.8	27	17.3	31	11.9			

*Fisher's Exact Test; d.f: Degrees of Freedom

4.3.2 Patient-Related Factors and their Influence on Self-reported Adherence to ART

Sixty nine percent (180) were rated to be very knowledgeable on ART and HIV. There was a significant association (Fishers Exact Test p=0.045) among those rated very knowledgeable and adhere to ART. The results showed that 76 % (198) did not agree that people had difficulties on taking ART daily while 153 (59 %) said distance to the clinic affected adherence. The duration of sex work for those who reported adherence to ART was about 4.1 years and 5 years for the non-adherence (Table 4.4).

All the respondents had disclosed their HIV positive status to someone with majority disclosing to friends.

Table 4.4: Patient Related Factors and their Influence on Self-Report Adherence to ARTin Nairobi City County, Kenya

	Self-Reported Adherence						d.f	Chi	P values
	Yes		**No**		**Total**				
	n	**%**	**n**	**%**	**n**	**%**			
Number of sexual partner last day of work (n=192)							3	1.257	0.262
1	75	97.4	108	93.9	183	95.3			
2	2	2.6	7	6.1	9	4.7			
0-3	57	77	85	78.7	142	78			
>3	17	23	23	21.3	40	22			
Period involved in a social group (n=189)							3	5.7528	0.124
Less than 6 months	4	5.7	11	9.2	15	7.9			
7-12 months	6	8.6	24	20.2	30	15.9			
1-2 years	34	48.6	48	40.3	82	43.4			
3 or more years	26	37.1	36	30.3	62	32.8			
Knowledge status on ART and HIV medication (n=260)							2		0.045*
Slightly knowledgeable	4	5.7	8	5.1	12	4.6			
Knowledgeable	19	18.4	49	31.4	68	26.2			
Very Knowledgeable	81	77.9	99	63.5	180	69.2			

***Fisher's Exact; ART: Antiretroviral Therapy**

4.3.3. HIV Condition-Related Factors and their Influence on Self-reported Adherence to ART in Nairobi City County, Kenya

Testing for HIV based on self-perception of HIV, disclosing HIV positive status to someone, experience of violence and being arrested by police did not influence self-reported adherence. All (N=260) respondents had disclosed their HIV positive status to someone had ever experienced violence (beaten, slapped, pushed, kicked, punched, choked, or burnt) because of their sexual identify. Twenty two percent (56) n=253 had ever been forced to have sex, 78 (31%) n=255 had been arrested because of their sexual identity/orientation or sex work and 147 (57.2%) were tested for HIV based on self-perception of risk. Alcohol and drug of addiction consumption was significantly associated Fisher Exact Test ($p<0.001$) with self-reported adherence to ART (Table 4.5).

Table 4.5: Influence of Condition Related Factors on Self -Reported Adherence to ART among Male Sex Workers in Nairobi City County Kenya

	Self -Reported Adherence								
	Yes		**No**		**Total**				
	n	**%**	**n**	**%**	**n**	**%**	**d.f**	**Chi Sq.**	**P Value**
Reasons for decision to go for HIV test n=257							4	6.531	0.163
Self-perception of risk	64	61.5	83	54.2	147	57.2			
Was unwell	27	26	35	22.9	62	24.1			
Referred by Doctor	5	4.8	10	6.5	15	5.8			
Campaign Message	8	7.7	19	12.4	27	10.5			
Others	0	0	6	3.9	6	2.3			
Arrested because of Sexual Identity N=254							1	3.078	0.079
No	77	75.5	99	65.1	176	69.3			
Yes	25	24.5	53	34.9	78	30.7			
Alcohol and drug of addiction use									<0.001*
No	101	97.1	86	55.1	187	71.9			
Yes	3	2.9	70	44.9	73	28.1			

*Fisher's Exact

4.3.4 Influence of Health Care System-Related Factors on Self -Reported Adherence to ART

The type of health facility where respondents were diagnosed with HIV, whether they were provided with information on ART initiation did not influence self-reports of adherence. The perception that the ART health provider treated the respondents poorly was significantly associated with self -reported adherence to ART ($\chi 2$ = 4.936; d.f=1; p=0.026) (Table 4.6).

Table 4.6: Influence of Health Care and Systems-Related Factors on Self-Reported Adherence among MSW in Nairobi City County, Kenya

			Self-Reported Adherence						
	Yes		No		Total				
	n	%	n	%	n	%	d.f	Chi sq.	value
Place of testing (n=257)							2	3.496	0.174
Government health facility	29	27.9	39	25.5	68	26.5			
Private health facility	37	35.6	41	26.8	78	30.4			
Special clinic for MSM/MSW	38	36.5	73	47.7	111	43.2			
ART information provided							1	0.082	0.775
No	29	27.9	41	26.3	70	26.9			
Yes	75	72.2	115	73.7	190	73.1			
Poor treatment by ART provider							1	4.936	0.026
No	95	91.3	127	81.4	222	85.4			
Yes	9	8.7	29	18.6	38	14.6			
Comfortable feeling while discussing HIV treatment							1	0.271	0.602
Very comfortable	79	76	114	73.1	193	74.2			
Not very comfortable	25	24	42	26.9	67	25.8			

Respondents' perception on the quality of care, including time allocated for consultation, being treated with respect, privacy and trust did not influence self-reported adherence (Table 4.7).

Table 4.7: Influence of perception of quality of care on Self -Reported Adherence among MSW Nairobi City County, Kenya

	Self-reported Adherence								
	Yes		**No**		**Total**				
	n	**%**	**n**	**%**	**n**	**%**	**d.f**	**Chi sq.**	**P value**
Perception on quality care in the ART clinic							1	0	1
Bad perception	14	13.5	21	13.5	35	13.5			
Good perception	90	86.5	135	86.5	225	86.5			
Feel listened to									
No	5	4.8	3	1.9	8	3.1			
Yes	99	95.2	153	98.1	252	96.9		1.741	0.187
Trust Health Providers								0	1
No	8	7.7	12	7.7	20	7.7			
Yes	96	92.3	144	92.3	240	92.3			
Privacy during consultation								0.617	0.432
No	7	6.7	7	4.5	14	5.4			
Yes	97	93.3	149	95.5	246	94.6			
Treated with respect									0.782*
No	4	3.8	5	3.2	9	3.5			
Yes	100	96.2	151	96.8	251	96.5			
*Fisher's Exact Test									

4.3.5 Treatment-Related Factors and their Influence on Self-reported Adherence

Examination of medical files showed that only 48 (18%) of those interviewed had a viral load test done with all of them having a desirable viral load below 1,000 copies per 10 mls. There was no influence of reminders to take medication and duration on treatment with self-reports of adherence. Among those who had reminders (112), thirty nine percent used phones alert, diaries and calendars. More than half 154 (61.4%) had been on ART for more than one year. Having a CD4 count taken was significantly ($\chi 2$ =11.143; d.f=1; p=0.001) associated with self-reported adherence (Table 4.8).

Table 4.8: Influence of Treatment Related-Factors and Self-reported Adherence among MSW in Nairobi City County, Kenya

	Self-reported Adherence							Test	
	Yes		No		Total				
	n	%	n	%	n	%	d.f	Chi sq.	P value
ART initiation (n=251)							1	3.017	0.082
Less than a year ago	46	45.1	51	34.2	97	38.6			
More than a year ago	56	54.9	98	65.8	154	61.4			
Reminders to take ART(n=252)							1	3.176	0.075
No	63	45	77	55	140	56			
Yes	38	34	74	66	112	44			
Ever had CD4 count							1	11.142	0.001
No	144	64	12	34	156	60			
Yes	81	36	23	66	104	40			

4.4 Barriers of Adherence to ART and their Influence on Self-reported Adherence

Forty nine percent (128) N=260 of the respondents had ever skipped taking their ART. There was a significant (Fisher Exact Test p<0.001) association between ever skipping ARVs and overall self-report of adherence. The reasons for skipping medication were grouped into three categories - treatment, health care system and patient factors.

4.4.1 Treatment –Related Barriers and Self-Reported Adherence to ART

All treatment-related reasons for skipping ART were significantly Fisher Exact Test, p<0.001 associated with self-reported adherence (Table 4.10).

Table 4.10: Distribution of Treatment Related Barriers and Self-reported Adherence among MSW in Nairobi City County, Kenya (n=260)

	Self-reported Adherence						
	Yes		No		Total		Fisher's Exact Test
Treatment related reasons for skipping ART	**n**	**%**	**n**	**%**	**n**	**%**	**P value**
Felt better							<0.001
No	1013	97.1	124	79.5	225	86.5	
Yes	3	2.9	32	20.5	35	13.5	
Experienced side effects							<0.001
No	1022	98.1	107	68.6	209	80.4	
Yes	2	1.9	49	31.4	51	19.6	
Pill burden							<0.001
No	1040	100	123	78.8	227	87.3	
Yes	0	0	33	21.2	33	12.7	
Shared pills							<0.001
No	1031	99	135	86.5	238	91.5	
Yes	1	1	21	13.5	22	8.5	
Didn't have the pills							<0.001
No	977	93.3	96	61.5	193	74.2	
Yes	7	6.7	60	38.5	67	25.8	

4.4.2 Health Care System Barriers and Self-reported Adherence

Health care systems-related barriers of adherence to ART included clinic not being accessible, distance to the clinic, lack of money to travel and being hospitalised. These factors were significantly associated with self-reported adherence (Table 4.11).

Table 4.11: Influence of Health Care System -Related Barrierson Self- Reported Adherence to ART among MSW in Nairobi City County, Kenya (n=260)

	Self-reported Adherence						
Access related reasons for skipping ART	**Yes**		**No**		**Total**		**Fisher Exact Test**
	n	**%**	**n**	**%**	**N**	**%**	**P value**
Clinic not accessible							0.001
No	102	98.1	133	85.3	235	90.4	
Yes	2	1.9	23	14.7	25	9.6	
Distance is too far							<0.001
No	103	99	125	80.1	228	87.7	
Yes	1	1	31	19.9	32	12.3	
Lack of money to travel							<0.001
No	102	98.1	104	66.7	206	79.2	
Yes	2	1.9	52	33.3	54	20.8	
Ever been Hospitalized							0.022
No	103	99	145	92.9	248	95.4	
Yes	1	1	11	7.1	12	4.6	

4.4.3 Patient-Related Barriers and Self-reported Adherence

Patient-related barriers to ART adherence included; use of drugs and alcohol, lack of food, depression, forgetting, lack of privacy needed to take medication, not having anyone to remind one to take medication, lack of care or support and having busy schedules. All these factors were significantly associated with self-reported adherence to ART (Table 4.12).

Table 4.12: Influence of Patient-Related Barriers on Self-reported Adherence among Male Sex Workers in Nairobi City County, Kenya (n=260)

	Self-reported Adherence						Test
	Yes		No		Total		Fisher Exact Test
	n	%	n	%	n	%	P Value
Alcohol and drug use							<0.001
No	101	97.1	86	55.1	187	71.9	
Yes	3	2.9	70	44.9	73	28.1	
Lack of food							<0.001
No	103	99	115	73.7	218	83.8	
Yes	1	1	41	26.3	42	16.2	
Depressed							<0.001
No	103	99	117	75	220	84.6	
Yes	1	1	39	25	40	15.4	
Simply forgot							<0.001
No	102	98.1	95	60.9	197	75.8	
Yes	2	1.9	61	39.1	63	24.2	
Feeling to hide medication							<0.001
No	101	97.1	105	67.3	206	79.2	
Yes	3	2.9	51	32.7	54	20.8	
Don't have any one to remind you take medication (n=252)							0.075
No	63	62.4	77	51	140	55.6	
Yes	38	37.6	74	49	112	44.4	
Lack of care and support							0.001
No	101	97.1	131	84	232	89.2	
Yes	3	2.9	25	16	28	10.8	
Too busy (n=260)							<0.001
No	102	98.1	78	50	180	69.2	
Yes	2	1.9	78	50	80	30.8	

Factor analysis (KMO =0.675; Bartlett's Test of Sphericity: Chi-square =34.393; d.f =21 and p=0.033) extracted experienced side effects; lack of support or care; sharing of pills and those who were too busy or lacked time from the 18 identified barriers as most important adherence to ART (Table 4.13).

Table 4.13: Extracted Factors for non-adherence to ART among MSW in Nairobi City County, Kenya

	Component			
	1	2	3	4
Felt better	0.373	0.694	-0.103	0.086
Experienced side effects	**0.697**	0.392	0.102	-0.120
Too busy	0-.054	0.178	0.069	**0.849**
Pill burden	0.465	0.315	0.210	0.400
Clinic not accessible	0.046	0.583	0.420	0.020
Lack of care or support	0.333	**0.714**	0.156	0.096
Lack of money to travel	0.519	0.408	0.071	0.231
Hospitalized	-0.043	0.328	0.688	0.142
Shared pills	0.274	0.089	**0.700**	0.147
Alcohol or drug use	0.440	-0.282	0.051	0.503
Did have the pills	0.254	-0.236	0.588	-0.036
Lack of food	0.636	0.141	0.287	-0.016
Depressed	0.659	0.111	0.376	-0.066
Distance	0.373	0.320	0.465	-0.074
Simply forgot	0.650	0.097	-0.010	0.285
Feeling to hide medication	0.598	0.243	0.280	0.092

4.4 Bivariate Analysis of Self -Reported Adherence and other Covariates

The direction of the binary logistic between reporting self-adherence and other covariates includes findings that were non-significant (NS) in chi-square tests as indicated. Younger respondents (below 24 years) were 1.6 times more likely to adhere to ART as compared to respondents over 34 years (NS). Respondents who had higher education levels were more likely (1.1 times) to be adherent as compared to respondents who had primary education (NS). (Table 4.14)

Table 4.14: Bivariate Analysis of Self-Reported Adherence and Patient –Related Covariates among MSW in Nairobi City County, Kenya

	Self -Reported Adherence				Test			
Covariate	n	%	n	%	**Fisher Exact**	P-Value	Odds Ratio	95%CI
Knowledge status on ARVs and HIV medication						0.045		
Slightly knowledgeable (12) REF	4	3.8	8	5.1				
Knowledgeable (68)	19	18.3	49	31.4			1.6	(0.5-5.6))
Very knowledgeable (180)	81	77.9	99	63.5			2.1	(1.1-3.8)
Number of sexual partner last day of work (n=192)						0.262		
1 (183)(REF)	75	97.4	108	93.9				
2 (9)	2	2.6	7	6.1			2.4	(0.5-12)
No. days practice sex in a week (n=182)					0.072*	0.788		
1-3 (143)	57	77	85	78.7			1.1	(0.5-2.2)
>3 (40) REF	17	23	23	21.3				
Ever experienced Sexual Violence (n=253)								
Yes (197)(REF)	80	79.2	117	77	0.176*	0675		
No (56)	21	20.8	35	23			1.1	(0.6-2.1)
Arrested because of Sexual Identity (n=234)					0.080*	3.078		
Yes(78) REF	25	24.5	53	34.8				
No (156)	77	75.5	79	65.2			1.6	(0.9-2.80)

*Chi-Square

Male sex workers who chose sex work due to non-income related reasons were 2.2 times more likely to be adherent as compared to those who reported to be in sex work to earn a living. (OR 1.9:CI95%; 1.1-4.5; P=0.017). Those mainly relied on income from sex work were more likely (1.9 times) to be adherent as compared to those who combined sex work and casual labour (NS). Similarly, those MSW with average monthly income below KES 1,000 than were (1.9 times) more likely to be adherent as compared to those that had income of more than KES 10,000 (NS).) (Table 4.15).

Table 4.15: Bivariate Analysis of Self-Reported Adherence and Socio-Economic Covariates among MSW in Nairobi City County, Kenya

	Self-Reported Adherence				Test			
Variable	**n**	**%**	**n**	**%**	**Chi**	**P-Value**	**OR**	**95%C1**
Main source of income (n=249)					5.734	0.125		
Sex work	34	34.3	67	44.7			1.9	(1.0-3.5)
Small business	35	35.4	36	24			1.1	(0.5-2.5)
Casual laborer (REF)	17	17.2	20	13.3				
Salaried employee	13	13.1	27	18			2	(0.8-4.5)
Average monthly income					0.654	0.234		
<1000	5	4.8	11	7.1			1.9	(0.6-5.9)
1001-5000	19	18.3	34	21.8			1.5	(0.8-3.0)
5001-10000	26	25	50	32.1			1.7	(0.9-3.1)
>10000 (REF)	54	51.9	61	39.1				
Main reason for getting sex work (n=188)					5.715	0.017		
No source of income (REF)	60	80	72	63.7				
Other reasons	15	20	41	36.3			2.1	(1.1-4.5)

*Odds Ratio

Respondents who were categorised as very knowledgeable were 2.1 times more likely to be adherent as compared to those that were slightly knowledgeable (OR =2.1; 95% CI; 1.2-3.9 P=0.045). Those who had one partner at the last day of work were two times (2.4 times) more likely to adhere to ART compared to those who had 2-3 partners (NS). The number of days that one was engaged in sex work also determined their likelihood to adhere to ART with those reporting less than three days 1.1 times more likely to adhere as compared to those who had more than three days of sex work (NS), (Table 4.16).

Table 4.16: Bivariate Analysis of Self-Reported Adherence and Patient –Related Covariates among MSW in Nairobi City County, Kenya

	Self -Reported Adherence				Test			
Covariate	n	%	N	%	Chi	P-Value	Odds Ratio	95%CI
Knowledge status on ARVs and HIV medication (n=260)						0.045*		
Slightly knowledgeable (12) REF	4	3.8	8	5.1				
Knowledgeable (68)	19	18.3	49	31.4			1.6	(0.5-5.6))
Very knowledgeable (180)	81	77.9	99	63.5			2.1	(1.1-3.8)
Number of sexual partner last day of work (n=192)						0.262*		
1 (183)(REF)	75	97.4	108	93.9				
2 (9)	2	2.6	7	6.1			2.4	(0.5-12)
No. days practice sex in a week (n=182)					0.072	0.788		
1-3 (143)	57	77	85	78.7			1.1	(0.5-2.2)
>3 (40) REF	17	23	23	21.3				
Ever experienced Sexual Violence (n=253)								
Yes (197)(REF)	80	79.2	117	77	0.1757	0675		
No (56)	21	20.8	35	23			1.1	(0.6-2.1)
Arrested because of Sexual Identity (n=234)					0.08	3.078		
Yes(78) REF	25	24.5	53	34.8				
No (156)	77	75.5	79	65.2			1.6	(0.9-2.80)

Respondents who reported to ever had a CD4 Count test conducted were 3.4 times (OR 3.4; 95% CI: 1.6-7.2; P=0.001) likely to be adherent as compared to those who had not had one done. Those who did not incur any cost to access ART were more likely to be adherent (OR 5.3; 95% CI 1.7-15.4; P=0.001). Those who were tested at the MSW special clinic were more likely to be adherent (OR 1.7, 95% CI 0.9-3.1) (NS) as compared to those who tested at the private health facility. Those who were provided with ART information at initiation were more likely (OR 1.7; 95% CI 0.9-3.1) (NS) to be adherent compared to those who did not receive information (NS). Respondents that were on ART for more than a year were more likely (OR 1.1; 95%

CI 0.8-1.8) NS to be adherent as compared to those who were on treatment for less than a year (Table 4.17).

Table 4.17: Bivariate Analysis of Self-Reported Adherence and Treatment and Health Care –Related Covariates among MSW in Nairobi City County, Kenya

	Self -Reported Adherence				**Test**			
Covariate	**n**	**%**	**N**	**%**	**Chi**	**P-Value**	**Odds Ratio**	**95%CI**
Place of testing (n=257)					3.4964	0.174		
Government health facility (68)	29	27.9	39	25.5			1.1	(0.6-2.3)
Private health facility(78) (REF)	37	35.6	41	26.8				
Special clinic for MSM/MSW (111)	38	36.5	73	47.7			1.7	(0.9-3.1)
Health worker provided information (n=260)					0.0815	0.775		
No (70)(REF)	29	27.9	41	26.3				
Yes(190)	75	72.1	115	73.7			1.1	(0.6-1.8)
Duration on ARV (n=251)					3.0173	0.082		
Less than a year ago (97)(REF)	46	45.1	51	34.2				
More than a year ago (154)	56	54.9	98	65.8			1.5	(0.9-2.6)
Ever had a CD4 count (N=260)					11.143	0.001		
No (156)	144	64	12	34				
Yes (104) (Ref)	81	36	23	66			3.4	(1.6-7.2)
Loss of Income as a result of Clinic Visit] (N=260)								
No (113)	49	47.1	64	41	0.942	0.332		
Yes(147) (REF)	55	55.2	92	59			1.2	(0.7-15.4)
Incur cost to access ART (N=260)						0.001*		
No (229)	100	96.2	129	87.2			5.3	(1.7-15.4)
Yes (31) REF	4	3.8	27	17.3				

*Fisher Exact Test ;

4.5 Multivariate Analysis of Correlates of Self-Reported Adherence to ART

In a multivariate model, logistic regression was performed to identify the independent correlates of self-reported adherence to ART, while adjusting for all confounders, to predict which of the correlates were associated with self-reported adherence. Sex work as the main source of income for MSW (95%; CI: 2.8-38.2 OR 8.9: p<0.001), and being knowledgeable on HIV and ART (95%; CI: 1.4-3.8 p=0.004), were significantly associated with self-reported adherence. For the non-significant correlates, income, levels of education; post-secondary education 3.9 (CI: 0.8-19.5) compared to primary level, and choosing sex work for non-income related reasons (3.9 (CI: 0.8-19.5) (NS) had the highest prediction values (Table 4.18; 1, 2, and 3).

Table 4.18-1: Multivariate Analysis of Independent Correlates of Self-Reported Adherence among MSW Nairobi City County, Kenya

Self-reported Adherence	**Test**				
Social Demographic Variables	**uOR***	**CI**	**aOR***	**CI**	**P-values**
Age (n=259)					
19-24 years (52)	1.6	(0.7-3.5)	2.1	(0.5-9.5)	0.444
25-29 years (71)	1.1	(0.5-2.4)	0.6	(0.1-3.2)	0.296
30-34 years (79)	1.1	(0.7-2.2	0.8	(0.2-3.3)	0.233
Over 34 years (57) REF					
Education level (n=256)					
Primary (44) REF					
Secondary (113)	1.1	(0.5-2.1)	2.6	(0.6-11.4)	0.901
Post-secondary (99)	1.1	(0.5-2.2)	3.9	(0.8-19.5)	0.864
Religious Denomination (n=257)					
Muslim (20)	2.4	(0.8-7.2)	2.3	(0.4-12)	0.114
Protestant (133)	1.1	(0.6-1.95)	1.6	(0.6-4.3)	0.170
Other(12)	2.4	(0.6-9.4)	0.9	(0.4-20.4)	0.227
Catholic (92)REF					
Marital Status (n=256)					
Never married (157)	1.9	(0.8-4.5)	0.6	(0.1-5.5)	0.823
Married to man (44)	2.1	(0.7-5.7)	1.2	(0.2-6.6)	0.470
Married to woman (31)	1.4	(0.5-4.2)	0.8	(0.1-5.5)	0.142
Separated/divorced (24) REF					
Duration of Years in Nairobi (n=259)					
1-5yrs (86) REF					
>5yrs (173)	1.2	(0.7-2.2)	1.3	(0.4-3.7)	0.765

*uOR- denotes Unadjusted Odds Ratio * aOR – denotes Adjusted Odds Ratio; CI-Confidence Interval

Table 4.18-2: Multivariate Analysis of Socio-Economic and Patient Related Correlates of Self-Reported Adherence to ART among MSW in Nairobi City County, Kenya

Socio-Economic Factors					
Main source of income (n=249)					
Sex work	1.9	(1.0-3.5)	8.9	(2.8-38.2)	<0.001
Small business	1.1	(0.5-2.5)	2.7	(0.5-15.3)	0.413
Salaried employee	2	(0.8-4.5)	16	(2.8-95.2)	<0.001
Casual laborer					
Average monthly income (n=260)					
<1000	1.9	(0.6-5.9)	3.7	(0.2-65.9)	0.786
1001-5000	1.5	(0.8-3.0)	0.6	(0.1-2.8	0.714
5001-10000	1.7	(0.9-3.1)	1.2	(0.4-3.5)	0.661
>10000					
Self-reported Adherence					
Patient Related Variables	**uOR***	**CI**	**aOR***	**CI**	**P-values**
Number of sexual partners at the last day of work (n=192)					
1	2.4	(0.5-12)	2.2	(0.5-12.2)	0.541
2 or more					
No. days practice sex in a week (n=182)					
0-3	1.1	(0.5-2.2)	1.2	(0.4-3)	0.165
>3					
Ever experienced Sexual Violence (n=253)					
Yes					
No	1.1	(0.6-2.1)	0.5	(0.2-1.7)	0.91
Arrested because of Sexual Identity					
Yes					
No	1.6	(0.9-2.80	1.7	(0.9-2.8)	0.435
Knowledge status on ARVs and HIV medication (n=260)					
Slightly knowledgeable					
Knowledgeable	1.6	(0.5-5.6))	1.6	(0.4-5.3)	0.009
Very knowledgeable	2.1	(1.1-3.8)	2.1	(1.4-3.8)	0.004

*uOR- denotes Unadjusted Odds Ratio * aOR – denotes Adjusted Odds Ratio

Table 4.18-3: Multivariate Analysis of Health Care RelatedCorrelates of Self-Reported Adherence to ART among MSW in Nairobi City County, Kenya

Self-reported Adherence					
Health Care Variables	**uOR***	**CI**	**aOR***	**CI**	**P-values**
Place of testing (n=257)					
Government health facility	1.1	(0.6-2.3)	1.1	(0.2-3.9)	0.17
Special clinic for MSM/MSW	1.7	(0.9-3.1)	2.2	(0.7-7.1)	0.98
Private health facility					
Health worker provided information (n=260)					
No					
Yes	1.1	(0.6-1.8)	1.1	(0.5-1.7)	0.272
When start taking ARV (n=251)					
Less than a year ago					
More than a year ago	1.5	(0.9-2.6)	1.6	(0.8-2.4)	0.165

4.6 Qualitative Analysis

The participants were of the focus group discussion were 37 male sex workers and 12 key informants (3 clinicians, 3 pharmacist, 3 counsellors and 3 managers of the ART sites) participants. Findings from the qualitative study were categorised into five thematic areas. The themes focused on barriers and facilitators of adherence to ART among the MSWs.

4.6.1 Proportion of Male Sex Workers who Self-Reported adherence to ART

According to Key Informants, 80 % of male sex workers in their ART programme were adherent. This proportion was however, said to be lower than that of other men in the general population.

4.6.2 Factors that influence adherence to ART among MSW.

These were grouped into social and economic, patient- related characteristics, treatment, and health care and health care systems factors.

4.6.2.1 Social and Economic Related Factors

The income levels of MSW was said to be closely linked to adherence to ART with low income levels perceived likely to miss ART clinic appointments due to the cost related to access. One respondent said that

"*Sometimes you find that clients are not many; such times we often miss clinic appointments and drug refills. We rely on our friends to share their drugs." (Respondent D, September 9, 2015).*

Similarly, key informants reported that those who had less income were likely to be non-adherent to ART. According to one key informant:

> "*Most of the MSW miss their appointment and cite lack of money for bus fare as the key reason. Sometimes back, we had a project that supported the patients with bus fare and attendance was almost 100% on all appointments" (KI X, October 16, 2015).*

Peer support and belonging to a support group was identified as facilitators of adherence to ART.

> "*We discuss ART adherence during group meeting at HOYMAS, this really helps me to adhere to my medication. We have treatment support partners to help remind us to take our ARVs. I had stopped sex work because I became sickly and went to the village; my friends came for me and brought me to the clinic. Since then, I always adhere to my medication"* (Respondent F3, September 10, 2015).

Homophobic environment surrounding MSW social support systems were reported compromise retention of MSW patients in ART care. Key informants pointed out that, the use of pseudo names was common among the MSW on ART to counter measure against homophobic encounters. This presented a problem in record keeping across the facility.

> *"Sometimes you chose to remain indoors for a while if neighbours suspect you as a male sex worker or man who has sex with men. In most cases if you get exposed, they would ask for your eviction from the neighbourhood" (*Respondent D2, September 10, 2015).

4.6.2.2 Patient and Condition Related Factors that influence adherence to ART

Respondents stated that information received before initiation of ART was critical to enhance adherence. This information included basic facts on HIV and AIDS; mode of transmission; prevention methods; how ARVs work; the importance of adherence; side-effects and how to minimise them; interactions between ARVs and other medicines such as herbal medicines, alcohol and drug abuse. Counselling was identified as one of the key interventions to enhance adherence to ART among MSW.

Adherence counselling was said to be important especially when one experienced major side effects.

> *"At the beginning I thought I would not manage to continue taking my ARTs. I felt dizzy most of the time, but the health worker counselled me to continue taking medications and the side effect would disappear"* ((Respondent I, September 10, 2015)

Sexual practices which included number of partners and the mobility were reported to influence adherence to ART with those who had many clients more likely to miss appointments for their refills and other clinical assessment.

> "*Sometimes the number of clients you get will determine if you go to the clinic for an appointment. Most of us work during the night and sleep*

during the day. By the time we get to town the clinic is closed, we need late night clinics to access ARVs"

(Respondent B2, September 10, 2015).

4.6.2. 3 Treatment and Health Care Related Factors

Incurring cost to access ART was reported a deterrent of adherence to ART. This cost included payment for diagnostics and treatment of opportunistic infections that were not covered by the free ART services in public health facilities. Other logistical impediments to access ARVs included short dosages provided before refills, transport- related costs and loss of income as a result of clinic appointment.

The respondents also reported that dispensing of ART in bottles was not user friendly for sex work. One of the MSW respondents said:

"We are a mobile population, today you are in Nairobi and the next day you follow your client to Mombasa. They tell us to make sure we keep ARVs in the containers/bottles which they are dispensed in. You can't conceal the drugs and you don't want clients to know you are on ARVs, so you just miss the doses until you return home" (Respondent C3, September 9, 2015).

Similarly, key informants reported that MSW often indicated that lack of bus fare was a main reason for missed appointments for review or drug refill. This sentiment was backed by one of the ARV users who said;

"Sometimes we have no transport to collect medication, so you borrow from each other hoping to return the doses after refill. Sharing pills makes most us not adhere to the prescribed doses. The rules for dispensing ARVs should be changed so that we should not be coming many days for a refill, which increases our cost". (Respondent Z, September 9, 2015)

Some MSW said that their treatment centre was too far away but they preferred them for fear of being stigmatised elsewhere. One of the respondents said*;*

"I often miss my appointments for refill because of lack of transport. Unfortunately there is no MSM friendly clinic near my home and I have to travel a long distance to come here".

Disclosure of one's HIV positive status was considered helpful to facilitate adherence to ART. All those interviewed indicated they had chosen to disclose their HIV status to someone for assistance. There was a caveat on disclosing HIV positive status to sexual partners by the discussants. Trustworthiness was reported as a key consideration before any disclosure could occur and group therapies were singled out as important avenues for disclosure. A key informant pointed out that disclosure of HIV positive status was one of the major barriers of adherence. It was reported that some MSWs refused to take their ART home and chose to make daily trips to the treatment centre to take their medications.

"There are a number of our members who live in extremely homophobic environment. They fear disclosing their HIV positive status which would result to double stigma. We keep their medication at the center". (KI3 October 16 2015).

The influence of stigma was emphasized by one of the discussants,

"*Most people are comfortable with people living with HIV, but when they know you are a male sex worker and you have HIV, you are blamed for acquiring the virus out of your own will, and they become less sympathetic"*(Respondent E3, September 10, 2015).

It was also reported that disclosure of HIV positive status facilitated adherence to ART.

"I live with my mother and since I disclosed my HIV status she reminds me every morning to take my drugs", (Respondent G, September 9, 2015).

4.6.2.4 Health Care and Health Systems-Related Characteristics that influence adherence to ART

Health providers at specialised clinics for MSM/MSW where were reported to be trusted which was attributed to adherence to ART

> *"Before I discovered there were specialized clinics for MSW/MSM, I visited a health facility elsewhere. I described to the nurse what I was feeling, I had anal discharge, and my ARVs were in Nairobi. She walked away and left me waiting for three hours and no one attended to me. I find health workers in MSM friendly clinics very helpful"* (Respondent H2, September 10, 2015).

Other concerns such as waiting time at the health facilities were highlighted, Some respondents expressed that though they were inconvenienced, the specialised MSW/MSM health facilities had a system that fast tracked their appointments, thereby reducing waiting time.

One key informant emphasised on the need for clinicians to allocate adequate time for each client before initiation of ART. We must understand that people belonging to groups such as MSW have unique challenges (KIB, October 17 2015).

> "*I take time to listen and understand all the challenges they perceive for not being able to take their ART at the beginning. We identify solutions together with the client which has been found to be effective"* (Respondent K, September 9, 2015)

It was also noted that ART clinics were not flexible enough to meet the needs of MSW. The frequency and timing of clinics was said not to be considerate to MSWs lifestyles. In addition, the need for friendly packages for ARVs that would make the drugs incognito was discussed.

4.6.3 Barriers to adherence to ART among MSW

A key factor attributed to skipping medication that included experience of side effects. Discussants reported that side effects that interfered with physical appearance such as those on the skin contributed to non-adherent to ART.

> *"Sometimes you can get a serious reaction on your skin because of ARVs. This will turn away your clients and so you opt to stop the drugs"* (*Respondent H, September 09, 2015*). Key informants identified enhanced adherence counselling, one on one follow up through short message services, peer support groups and patient drug literacy as intervention found effective in promoting adherence among the MSW

Excessive alcohol consumption and drug abuse was attributed to non-adherent to ART. It was found that peers would often leave drugs in popular bars after collecting their refill. One of the bar proprietors near the ART sites was said to be kind enough and often returned the drugs to the nearby ART clinic frequented by his bar patrons. This finding was corroborated by a key informant who confirmed receiving such refills from a bar proprietor:

> *"We receive drugs dispensed to MSW after they have left them at a nearby bar. We try to trace the MSW to re-collect his refill but sometimes it's difficult to get them in good time to avoid missed doses.*" (KIA, October 17, 2015).

Another respondent said that;

> *"It's difficult to practice sex work without taking drugs and alcohol. Sometimes we lose our ARTs in bars when we get drunk"* (Respondent A3, September 9, 2015)

The FGD respondents reported that being arrested by police because of the sexual orientation and sex work was a major challenge for those on ART. Incarceration in the police cells was blamed for skipping ARVs and overall adherence.

"Most of the time when I am arrested by police I do not take my ARVs They take away your phone and you cannot reach anyone to bring the drugs until you secure your freedom" (Respondent C2, September 10, 2015).

Lack of food was identified as a major deterrent to ART adherence. This was linked to income levels, the unpredictable nature of sex work and lack of time to prepare meals. Key informants indicated that programmes that included nutrition components such as food for drugs enhanced adherence to ART. Similarly, the FGDs identified lack of food as one of the most common perceived barrier of adherence to ART. Respondents reported that they would not take their ART without meals because this would result to undesired side effects. Screening of MSW on ART to consider those in need for food subsidies was strongly recommended. The FGD discussant identified lack of food either due to busy schedule that made it impossible to find time to prepare meals or lack of money to spend on food as a key determinant of adherence too. One of the respondents said;

"Most of us stop taking ARVs and revert to septrin for prophylaxis to avoid side effects of using ART in an empty stomach" (Respondent F3, September 10, 2015).

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECCOMENDATIONS

5.1 Discussion

5.1.1 Proportion of Study Respondents who self-reported adherence to ART

This study established that out of the 260 respondents, 104 (40%) were self-reported adherent. Based on the composite assessments criterion, it is implied that these respondents reported that they had never missed any ART clinic appointment, never skipped taking their ART and had routine CD4 count monitoring test done. The average age of the respondents was 30 years (SD=6). Low ART mean adherence were reported in other populations, A study California, found a mean adherence to ART of 53% among men (Becker *et al.*,2002), and two other earlier studies conducted in the United States involving 235 and 244 HIV positive patients, found mean adherence of 46% and 40% respectively (Gir *et al.,* 1998; Eldred *et al.,* 1998).Although strict adherence to ART regimens is relatively rare, a mean adherence rates of 91.25% was found among 63.7% of HIV positive patients in South India (Basavaprabhu *et al.,* 2013). A 2011 meta-analysis, which pooled ART adherence of 33,199 adults in 84 observational studies, established 62% of individuals took at least 90% of their prescribed ART doses. In this analysis, studies with higher proportions MSMs had more individuals maintaining ≥90% adherence as compared to other groups such as people who inject drugs (Ortego 2011).In Kenya, 78.2 % of men in the general population self- reported adherence to ART based on missed doses and appointments. This study established a correlation between self-reported adherence and respondents 'viral suppression (MOH, 2012). Marks *et al.,* 2010 and Bisson *et al.,* 2008 also established significant correlation of patients' self-assessments of adherence—through interviews or self-administered questionnaires with viral load tests. In this study, health providers estimated on average that 80% of the MSW were adherent. Gao, 2000 found that adherence estimates by health providers were exaggerated due to reliance on patient self-reports that are subject to both recall bias and patient desire to please the provider and avoid criticism.

The relatively low proportions of MSW who were found to report adherence to ART in this study, confirms report by Graham *et al.,* 2013 who established that's and MSW had lower levels of ART adherence and poor weight gain during treatment compared to other heterosexual men and women in similar treatment sites. Health outcomes of ART are largely dependent on nearly perfect adherence levels for sustained viral suppression, to maintain immune health, and slow disease progression (Hortsmann *et al.,* 2010; Marks *et al.,* 2010). In this study, the low proportions of MSW who self-reported adherence compromises The low treatment adherence for the study respondents also compromises the expected individual and public health benefits of ART (Cohen *et al.,* 2011; WHO, 2016).In Kenya, 42% of individuals who reported missing an ART dose 30 days preceding (non-adherent) a survey were found not be virally suppressed (MOH, 2012). The consequences of non-adherent to ART among 156 (60%) of the study respondents include the likelihood for higher AIDS related mortality (Paterson *et al.,* 2000; Brenner *et al.,* 2000; Quinn *et al.,* 2000; Bangsberg *et al.,* 2001).

5.1.2 Factors associated with adherence to ART among male sex workers

This study found out that socio-economic and patient-related factors associated with adherence were not incurring cost to access ART (OR 5.3; 95% CI 1.7-15.4; P=0.001), main source of income as sex work (OR 8.9; 95%; CI: 2.8-38.2: p<0.001) and knowledge on HIV and ART (OR =2.1; 95% CI; 1.4-3.8; P=0.004) were associated with treatment adherence. The relationship between ART related costs and adherence in developing countries is documented elsewhere (Crane *et al.,* 2006; Kumarasamy *et al.,* 2005 and Weiser *et al.,* 2003). In this study, despite the availability of ART at no cost through public health facilities in Kenya, those who incurred cost were 5 times unlikely to adhere. Antiretroviral associated costs identified in this study included cost of transport, prescription, and diagnostic tests. The cost of transport to the ART clinic was a dominant theme of the qualitative discussions. Policy level documents have documented cost associated with ART as an impediment to adherence among some patients (MOH, 2014). In Botswana, it was predicted on the basis of logistic regression, that adherence would increase from 54% to 74% if cost were removed as a barrier (Weiser *et al.,* 2003).

This study established that MSW who only relied on sex work were 8.9 times (OR 8.9; 95%; CI: 2.8-38.2: p<0.001) more likely to adhere than those who combine sex work with casual labour. Sexual behaviors of people living with HIV on ART remain a topic of major interest in Sub-Saharan Africa where the great majority of infections are attributable to sexual transmission. In this study, the number of partners and days of sex work determined the likelihood to adhere to ART with those with fewer sexual partners and less days of sex work were more likely to adhere NS(OR 95%:CI. 0.5-1.2;P=0.262). Vernazza *et al.,* 2008 found on-significant relationship between the sexual behaviour of the MSW and their adherence to ART. Laurent *et al.,* 2011, found few longitudinal data sources that describe sexual behaviors during the course of ART or assess the temporal relationship between ART adherence and sexual behaviors. This relationship was of particular interest amidst evidence of reduced likelihood of HIV sexual transmission in patients with a history of adherence and controlled viremia.

The level of ART knowledge was significantly (OR =2.1; 95% CI; 1.4-3.8; P=0.004) associated with self-reported adherence among MSW in this study. The association between knowledge of HIV and ART is documented elsewhere. In a study, conducted in South Africa, poor knowledge of HIV and ART was attributed to poor adherence among patients in the general population (Terblanche &Stellenberg 2014). In Ghana, women living with HIV who had inadequate knowledge on ART were more likely to default from prevention of mother to child transmission care, 90% of the women had low ART knowledge (Boateng *et al.,* 2013). Another study conducted in Ethiopia to establish association of knowledge on ART plan, regimen and adherence found those who were knowledgeable more likely to be adherent than those who were not (Demessie *et al.,* 2014) suggesting knowledge on different components of ART is crucial in improving patient adherence. In Togo lack of ART knowledge was found to be a cause of non-adherence, where 45 % of the HIV-infected patients were not aware of the names of their prescribed ART medication (Potcho *et al.,* 2010).

Alcohol and drug abuse was found to be associated (Fisher Exact Test (p<0.001) with self-reported adherence in this study. Studies from both wealthy and other

resource-poor countries show that the higher frequency of alcohol is counter-productive to adherence to ART and overall health of people living with HIV. Excessive alcohol use was found to result into depression among the MSW which was also found to significantly affect adherence to ART (Ferro *et al.,* 2015). Depression was found a significant barrier (P<0.0001) to ART adherence in this study. This relationship between alcohol and depressive symptoms has been documented in other studies (Hasin *et al.,* 2005, Kessler *et al.,* 2005).

Perceived poor treatment by ART health provider ($\chi 2 = 4.9364$; d.f=1; p=0.026) and having had a clinical monitoring test of CD4 count ($\chi 2 = 11.143$; d.f=1; p=0.001) were significantly associated with self-adherence. A participant in the study described his unpleasant experience of seeking services to treat rectal sexually transmitted infections where he was shunned by the health care provider without being provided the services he required. (Lane *et al.,* 2008 found that MSM presenting for rectal sexually transmitted infections were particularly vulnerable to poor treatment, because rectal STIs were evidence that men had engaged in a particularly taboo sexual behavior. Such poor treatment by health care providers has been found to negatively impact health seeking behaviour. In an earlier study conducted in Kenya, MSW found difficulties in locating a health provider who was trained to address their unique needs and fear of being reported to legal authorities are some of the identified barriers to seeking health services (Onyango *et al.,* 2006). Elsewhere MSW were found to have poor access to HIV services compared to other populations due to fear denial of care, and even blackmail (Fay *et al.,* 2011; Lane *et al.,* 2008). The health care system and service delivery influences patient adherence or non-adherence to long term treatment. Use of positive reinforcement through clinical monitoring and informing patients of their low or suppressed HIV viral load levels and increases in CD4 cell counts fosters adherence and can help patients maintain high levels of adherence (WHO, 2003). In this study, patient who were aware they had a CD4 count test and viral load taken also reported adherence to clinic appointments.

5.1.3 Barriers to ART Adherence among male sex workers

Seventeen perceived barriers of ART adherence were identified and grouped into patient related barriers; alcohol and drug use, lack of food, depression, forgetting to take medication, lack of reminders, lack of time because of busy schedule, the need to hide medication from others, all at ($p<0.001$ Fisher's Exact Test) and Lack of support and care ($p<0.001$ Fisher's Exact Test) were significantly associated with self-reported adherence. Treatment related barriers; Felt better, Experienced side effects, pill burden, shared pills and not having ART were significantly all at ($p<0.001$Fisher's Exact Test) associated with self- reported adherence. Health care and system related barriers; clinic not accessible ($p=0.001$ Fisher's Exact); Distance to the clinic ($p<0.001$Fisher's Exact); and ever hospitalised ($p<0.022$ Fisher's Exact) were associated with self-reported adherence. Factor analysis of the barriers identified experience of side effects, lack of support or care, sharing of pills and lack of time as the most important barriers among MSW.

Those who experienced side effects had about 95 % chance of skipping drugs as compared to those who did not. Experience of side effect was documented as a perceived barrier to adherence to ART in other studies (Chesney *et al.,* 2000). Some of the undesirable side effects of HIV medications identified included nausea, vomiting, diarrhea, and fatigue, as well as longer term effects including oral numbness, persistent metallic taste, cardiovascular problems, lipid redistribution, and neuropathy. Sanon *et al.,* 2002, recommended that support systems for adherence should take into account the factors influencing perceptions of the ART drugs to provide specific psychological support during treatment initiation and follow up. Clinic attendance has previously been documented as a barrier to adherence to ART in Kenya. Eighty percent of those who self –reported non-adherence in the general population indicated that being too busy to attend clinic appointments as a major cause of non-adherent (MOH, 2012). Clinic appointment is an important proxy indicator that measures retention of patients in ART programme with an ultimate goal of promoting adherence and treatment outcomes. Time factor was also identified as a perceived barrier in this study. Those who missed ARV because they were too busy had about 98 % higher chances of not adhering to ART. Equally,

those who lacked support and care were about 1.4 times likely not to adhere. Lack of care and support for MSW was earlier identified as a barrier of adhering to ART. Lack of food to take with medication, forgetfulness and ART related myths were described as a key barrier in this study. Weiser *et al.* 2003 documented that in African settings, Lack of a square meal a day was related to missed ART doses. In other studies targeting other populations (Chesney *et al.*, 2000; Turner, 2002), the most common perceived barrier to adherence was forgetfulness. Curran *et al.*, 2014 reported in a study conducted among sero-discordant couples in Kenya of a wide spread perception that ART initiation signified the final stage before death as key barrier to adherence.

5.1.4 Summary of Key Findings

The complexity of adherence requires closer examination of factors that affect both individual and group of people with similar characteristics. Based on the study findings, adherence enhancing interventions for MSW should be designed to address significant factors of cost-related to access ART, alcohol and drug abuse, training for ART providers, patient education on routine monitoring of treatment outcome for positive reinforcement. This study establishes a number of key finding in regard to cost associated to access free ART. The two cost related issues emphasised by respondents and participants are transport to the health facilities and food to support ART patterns. Experience of side effects will require individualized communication and counselling with the MSW. This study found that MSW were predisposed to alcohol and drug abuse due to the nature of their work and working environment an indication that ART models for this group should screen and intervene for alcohol and drug abuse. The study establishes that the specialized MSM/MSW clinics are reported to provide quality services compared to other available clinics. This factor is however contraindicated by lack of transport and the need to travel distances to locate friendly health care workers. Standardized training for health care workers on MSW issues would broaden their options to access ART and minimize associated cost such as transport.

The study also established other factors that were attributed to non-adherence to ART among MSW. One out every three of the MSW reported they had been arrested by police because of their sexual orientation. Although police arrest was not significantly associated with self –report of adherence to ART, ($\chi 2$=3.078; d.f=1; p=0.079), (68%) of those who reported to have been arrested were non-adherent to ART. Frequent police harassment, arbitrary arrests for loitering and extortion of money or sexual services were also reported in other studies among MSW in Kenya (Okal, 20011). Stigma, discrimination, and social isolation are reported to undermine the ability of criminalized groups such as MSM to engage in and adhere to care (Lane *et al.,* 2008; Sharma *et al.,* 2008).

All respondents reported experience of violence three months preceding this study with 56 (22%) reporting experience of sexual violence. Earlier studies conducted in Nairobi City, Kenya found 39 %of MSW surveyed had experienced violence a year preceding the survey (Onyango 2006). The association of violence on self-reported adherence although not significant (0.5; 95% CI; 0.2-1.7; P=0.675) showed that those who had experienced violence were more unlikely to adhere to ART as compared to those who had not. High (43%) prevalence of sexual violence has been reported by Kenyan female sex workers too(Chersich *et al.,* 2007).The influence of violence and police arrest on ART Treatment interruption was expressed as a risk to non-adherence in this study owing to frequent arrest by the police or violence from the communities where they live. The complexity and context of the environment MSW live therefore, implies that a single ART adherence intervention may not enhance adherence. An approach that allows for group context and individualized care is likely to yield better results.

5.1.5 Study Limitations

The study acknowledges that the findings need to be interpreted cognisant of a number of limitations. First, the cross sectional design applied in this study disqualifies conclusive statements regarding the direction of associations among study variables. Secondly, whereas, Respondent-Driven Sampling technique used in this study provides the best option to recruit hidden populations, it may fail to

precisely remove bias when they occur. Thirdly, the results must also be interpreted in the context of limitations associated with self-reported measures such as introspective ability; honesty/image management which may have impacted on the study results. Attempts to validate the respondents self-report of adherence with clinical records were not successful. Some of the respondents accessed ART in multiple sites. Where such records were available, the records they were incomplete and inconsistent.

5.2 Conclusions

This study while recognizing the overall limitation of a cross-sectional study design to make authoritative conclusions established the following;

1. Forty percent of MSW in Nairobi City County Kenya were found to be adherent based on self-reports.
2. The study established the following factors were associated with self – reported adherence to ART; the main reason for getting into sex work ($\chi 2$ =5.715, d.f=1 p=0.017);Incurring cost to access ART ($\chi 2$ = 10.767, d.f=1, p=0.001;) being very knowledgeable on HIV and ART (Fishers Exact Test p=0.045) alcohol and drug abuse Fisher Exact Test ($p<0.001$); perceived poor treatment by ART health provider ($\chi 2$ = 4.9364; d.f=1; p=0.026) and having had a clinical monitoring test of CD4 count ($\chi 2$ =11.143;d.f=1;p=0.001) were significantly associated with self-reported adherence among male sex workers in Nairobi City County.
3. All Seventeen perceived barriers of ART adherence were identified;

   Patient related barriers; alcohol and drug use, lack of food, depression, forgetting to take medication, lack of reminders, lack of time because of busy schedule, lack of privacy, and Lack of support and care were significantly associated with self-reported adherence.

Treatment related barriers; Felt better, Experienced side effects, pill burden, shared pills and not having Health care and system related barriers; clinic not accessible, Distance to the clinic and ever hospitalised .

Factor analysis of the barriers identified experience of side effects, lack of support or care, sharing of pills and lack of time as the most important barriers among MSW in Nairobi County City Kenya.

5.3 Recommendations

Ministry of Health to implementation of multidimensional MSW centered treatment models which includes alcohol and drug abuse interventions.

The Ministry of health to consider policy level decisions to address structural barriers on cost of access and health care workers training gaps on MSW friendly services.

Health providers to consider implementation of group and individualized care models that screen and address perceived barriers to ART.

5.4 Areas for Further Research

Based on limitations of cross-sectional design studies, there is for additional studies using other study designs and multiple methods of measuring adherence. There is also need for studies to evaluate cost-effectiveness and impact of ART adherence enhancing interventions among the MSW.

REFERENCES

Abah, I.O., Falang, K., Finangwai, A., Iyaji, P., Wakdet, L., Odesanya, R., & Kanki, P. (2006).Specific interventions to improve adherence to antiretroviral therapy in resource limited settings: the experience from Jos, Nigeria. 16th International Conference on AIDS; Toronto, Canada.

Attia, S., Egger, M., Muller, M., & Zwahlen, M. (2009). Low N. Sexual transmission of HIV according to viral load and antiretroviral therapy: systematic review and meta-analysis. *AIDS*, *23*, 1397–404.

Amico, K.R., Harman, J.J., & Johnson, B.T. (2006). Efficacy of antiretroviral therapy adherence interventions: a research synthesis of trials, 1996 to 2004. *Journal of Acquired Immune Deficiency Syndromes, 41*(3), 285–97.

Balint, S., & O'Donnell, R. (2007). Beyond compliance, *Occupational Health and Safety*, *76*(6), 106–107.

Bangsberg, D.R., Hecht, F.M., Charlebois, E.D., Zolopa, A.R., Holodniy, M., Sheiner, L., & Moss, A. (2000). Adherence to protease inhibitors, HIV-1 viral load, and development of drug resistance in an indigent population. *AIDS*, *14*(4), 357–366.

Bangsberg, D.R., Perry, S.,Charlebois, E.D., Clark, R.A., Roberston, M., Zolopa, A.R,, & Moss, A.(2001).Non-adherence to highly active antiretroviral therapy predicts progression to AIDS. *AIDS*, *15*(9), 1181-3.

Baral , S., Beyrer, C., Muessig, K., Poteat, T., & Wirtz, A;L. (2012). Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. *Lancet Infectious Diseases*, *12*, 538–549.

Basavaprabhu, A., Deepak, M., Unnikrishnan, B, John, T., Satish, R., Soundarya, M. (2013. Adherence to Antiretroviral Therapy among

People Living with HIV. *North American Journal of Medical Science, 5*(3), 220-223.

Becker, S., Dezil, C.M., Burtcel, B., Kawabata, H., & Hodder, S. (2002). Young HIV-infected adults are at greater risk for medication nonadherence. *Medscape General Medicine Medscape HIV/AIDS, 4*(3), 21.

Beyrer, C., Baral, S.D., Walker, D., Wirtz, A.L., Johns, B., & Sifakis, F. (2010). The expanding epidemics of HIV type 1 among men who have sex with men in low- and middle-income countries: diversity and consistency. *Epidemiology Reviews Journal. 32*, 137–51.

Bisson, G., Gross, R., Bellamy, S., Chittams, J., Hislop, M., Regensberg, L., & Nachega, J. (2008). Pharmacy Refill Adherence Compared with CD4 Count Changes for Monitoring HIV-Infected Adults on Antiretroviral Therapy. PLOS *Medicine., 5*, e109.

Boateng, D., Kwapong, G.D., & Agyei-Baffour, P. (2013). Knowledge, perception about antiretroviral therapy (ART) and prevention of mother-to-child-transmission (PMTCT) and adherence to ART among HIV positive women in the Ashanti Region, Ghana: a cross-sectional study. *Bio Medical Central Women's Health Journal*; 13:2.

Brenner, B., Salomon, H., Wainberg, M.A., Quan, Y., Rouleau, D.,Coté, P., LeBlanc, R., … & Routy, J.P. (2000).Prevalence of HIV-1 resistant to antiretroviral drugs in 81 individuals newly infected by sexual contact or injecting drug use. Investigators of the Quebec Primary Infection Study. *AIDS, 14*(Suppl), F17–F23.

Chalker, J., Andualem, T., Gitau, L., Ntaganira, J., Waako, P., Obua, C., Ross-Degnan, D. & INRUD, I.A.A. (2010). Measuring adherence to antiretroviral treatment in resource-poor settings: A health system approach. *Bio Medical Central Health Services Research*, 10, 43.

Chersich, M.F., Luchters, S.M., Malonza, I.M., Mwarogo, P., King'ola, N., & Temmerman, M. (2007). Heavy episodic drinking among Kenyan female sex workers is associated with unsafe sex, sexual violence and sexually transmitted infections. *International Journal of STD and AIDS*, *18*(11), 764–9.

Chesney, M.A., Ickovics, J.R., Chamber, D.B., Gifford, A.L., Neidig, J., & Zwickl, B. (2000). Self-reported adherence to antiretroviral medications among participants in HIV clinical trials: the AACTG Adherence Instruments. *AIDS Care-Psychological and Socio-Medical Aspects of AIDS/HIV*, *12*(3), 255–266.

Chesney, M.A., (2000). Factors affecting adherence to antiretroviral therapy. *Clinical Infectious Diseases*, 30:S171–176.

Ciechanowski PS, Katon, WJ, and Russo, JE. (2000). Depression and diabetes: impact of depressives symptoms on adherence, function, and costs. *Archives of Internal Medicine Journal, 27*, 3278-3285.

Cohen, S., Chen, Y., McCauley, M., Hosseinipour, M., Kumarasamy, N., Hakim, J., & Fleming, T.R. (2011). Prevention of HIV-1 infection with early antiretroviral therapy. *New England Journal of Medicine, 365*, 493–505.

Cohen, J. & Karen, S. (2008). The impact of medication regimen factors on adherence to chronic treatment: a review of literature *Journal of Behavioural Medicine, 31*(3), 213-224.

Crane, J.T., Kawuma, A., Oyugi, J.H., Byakika, J.T., Moss, A., Bourgois, P., & Bangsberg, D.R. (2006). The price of adherence: qualitative findings from HIV positive individuals purchasing fixed-dose combination generic HIV antiretroviral therapy in Kampala, Uganda. *AIDS and Behavior, 10*(4), 437–442.

Crepaz, N., Hart, T.A., and Marks, G. (2004). Highly active antiretroviral therapy and sexual risk behavior: a meta-analytic review. *Jama Network, 292,* 224–236.

Crum, N.F.1., Riffenburgh, R.H., Wegner, S., Agan, B.K., Tasker, S.A., Spooner, K.M., Armstrong, A.W., & Wallace, M.R.(2006). Comparisons of causes of death and mortality rates among HIV- infected persons: analysis of the pre-early and late HAART (highly active antiretroviral therapy). *Journal of Acquired Immune Deficiency Syndromes, 41,*194-200.

Curran, K., Ngure, K., Shell-Duncan, B., Vusha, S., Mugo, N.R., Heffron, R., Celum, C. & Baeten, J.M., (2014). If I am given antiretrovirals I will think I am nearing the grave': Kenyan HIV serodiscordant couples' attitudes regarding early initiation of antiretroviral therapy. *AIDS*, *28*(2), 227.

Demessie, R., Mekonnen, A., Amogne, W., & Shibeshi, W. (2014). Knowledge and adherence to antiretroviral therapy among adult people living with HIV/AIDS at Tikur Anbessa Specialized Hospital, Ethiopia. *International Journal of Basic and Clinical Pharmacology*, *3*(2), 320–30.

Dukers, N.H., Goudsmit, J., de Wit John, B., Dukers, N.H.T.M.; Goudsmit, J. de Wit, J., & Roel, A. (2001). Sexual risk behaviour relates to the virological and immunological improvements during highly active antiretroviral therapy in HIV-1 infection. *AIDS, 15*, 369–78.23.

Dunkle, K.L., Stephenson, R., Karita, E., Chomba, E., Kayitenkore, K, (2008). New heterosexually transmitted HIV infections in married or cohabiting couples in urban Zambia and Rwanda: an analysis of survey and clinical data. *Lancet, 371,* 2183–2191.

Eldred, L., Wu, A., Chaisson, R., & Moore, R. (1998). Adherence to antiretroviral and pneumocystis prophylaxis in HIV disease. *Journal of Acquired Immune Deficiency Syndrome Human Retroviral, 18,* 117–25.

Farmer, P. (1997).Social scientists and the new tuberculosis. *Social Science and Medicine, 44,* 347–58.

Fay, H., Baral, S.D., Trapence, G., Motimedi, F., Umar, E., Iipinge, S., … & Beyrer, C. (2011). Stigma, health care access, and HIV knowledge among men who have sex with men in Malawi, Namibia, and Botswana. *AIDS and Behaviour*; *15,* 1088–1097.

Ferro, E.G.,Weikum, D., Vagenas, P., Copenhaver, M.M.,Gonzales, P., Peinado, J., … & Altice, F.L. (2015). Alcohol use disorders negatively influence antiretroviral medication adherence among men who have sex with men in Peru. *AIDS, 27*(1), 93-104.

FIDA Kenya, (2008). Documenting Human Rights Violation of Sex Workers in Kenya. Nairobi: FIDA Kenya.

Fisher, A.A., Laing, J.E., & Totwnsend, J.W. (1998). *Handbook for Family Planning Operations Research Design,* (2nd Ed.). New York: Oxford University Press Inc.

Fox, P., Sydney, R. (2010). Patient retention in antiretroviral therapy programs up to three years on treatment in sub-Saharan Africa, 2007–2009: systematic review; *Tropical Medicine and International Health, 15,* 1–15.

Gao X, Nau DP. (2000). Congruence of three self-report measures of medication adherence among HIV patients. *Annals of Pharmacotherapy, 34*, 1117–1122.

Gehi, A.K.,' Ali, S., Na, B., & Whooley, M.A. (2007). Self-reported medication adherence and cardiovascular events in patients with stable coronary heart disease: the heart and soul study. *Archives of Internal Medicine Journal*, *167*(16), 1798-803.

Geibel, S., Luchters, S., King'ola, N., Esu-Williams, E., Rinyiru, A., &Tun, W. (2008). Factors Associated with Self-reported Unprotected Anal Sex

Among Male Sex Workers in Mombasa Kenya. *Sexually Transmitted Diseases, 35*(8), 746-52.

Gelmon, L., Kenya, P., Oguya, F., Cheluget, B., & Girmay, H. (2009). *Kenya HIV Prevention Response and Modes of Transmission Analysis.* Nairobi: National AIDS Control Council.

Gerald, L.B., McClure, L.A., Harrington, K.F., Mangan, J.M., Gibson, L., & Atchison, J. (2007). *Design of the supervised asthma therapy study: Implementing an adherence intervention in urban elementary schools.* Contemporary Clinical Trials.2007 in press.

Gilbert, J., Evans, C., Haynes, R., & P Tugwell, P, (1980). Predicting compliance with a regimen of digoxin therapy in family practice. *Canadian Medical Association, 123,* 119–122.

Gill, C.J. (2005). No room for complacency about adherence to antiretroviral therapy in Sub - Saharan Africa. *AIDS, 19*(12), 1243 - 1249.

Giordano, T., Gifford, A., &White, A. (2007). Retention in care: a challenge to survival with HIV infection. *Clinical Infectious Diseases*; *44*, 1493–1499.

Gir, E., Pratt, R., Bunch, E.H., & Holzemer, W. (1998). *Adherence to anti-retroviral therapy: a four country comparison.* In: Program and abstracts of the 12th World AIDS Conference. Geneva: Marathon Multimedia

Gorstein, J., Sullivan, K.M., Parvanta, I., & Begin, F. (2007). Indicators and methods for cross-sectional surveys of vitamin and mineral status of populations. Micronutrient Initiative (Ottawa) and Center for Disease Control and Prevention (Atlanta), pg. 29).

Government of Kenya, (2008). *Laws of Kenya, Penal Code, chapter 63, sections 162–165*. National Council for Law Reporting. Nairobi: Government of

Kenya. Retrieved from: http://www.kenyalaw.org/kenyalaw /klr_app/ view_cap.php?CapID=52

Graham, S.M., Mugo, P., Gichuru, E., Thiong'o, A., Macharia, M., Okuku, H.S., … & Sanders, E.J.(2013). Reporting High-Risk Sexual Behavior, Including Men Who Have Sex with Men, in Coastal Kenya. *AIDS and Behaviour, 17*, 1255–1265.

Grant, R.M., Lama, J.R., Anderson, P.L., McMahan, V., Liu, A.Y., Vargas, L., … & Glidden, D.V. (2010). Pre-exposure chemoprophylaxis for HIV prevention in men who have sex with men. *New England Journal of Medicine, 363*, 2587-2599.

Haberer, J., Kahane, J., Kigozi, I., Emenyonu, N., Hunt, P., Martin, J., & Bangsberg, D. (2010). Real-Time Adherence Monitoring for HIV Antiretroviral Therapy. AIDS and Behaviour, *14*, 1340–1346.

Hahn, J.A., Bwana, M.B., Javors, M.A., Martin, J.N., Emenyonu, N.I, & Bangsberg, D.R. (2010). Biomarker testing to estimate under-reported heavy alcohol consumption by persons with HIV initiating ART in Uganda. *AIDS and Behaviour*, *14*(6), 1265–8.

Hales, G., Mitchell, J., Smith, D.E., & Kippex, S. (1988).*Validity of patient questioning versus pill count as an assessment of compliance*. In: Program and abstracts of the 12th World AIDS Conference. Geneva: Marathon Multimedia.

Hart, J.E., Jeon, C.Y, & Ivers, L.C., Behforouz, H.L., Caldas, A., Drobac, P.C., & Shin, S.S. (2010). Effect of directly observed therapy for highly active antiretroviral therapy on virologic, immunologic, and adherence outcomes: a meta-analysis and systematic review. *Journal of Acquired Immune Deficiency Syndromes, 54*(2), 167–79.

Hasin, D.S., Goodwin, R.D., Stinson, F.S., & Grant, B.F.(2005).Epidemiology of major depressive disorder: results from the National Epidemiologic

Survey on Alcoholism and Related Conditions. *Archives of General Psychiatry*; *62*(10), 1097-106.

Hecht, F., Colfax, G., Swanson, M., & Chesney, M. (1988). *Adherence and effectiveness of protease inhibitors in clinical practice* [abstract 15]. In: Program and abstracts of the 5th Conference on Retroviruses and Opportunistic Infections (Chicago). Alexandria, VA: Foundation for Retrovirology and Human Health.

Heckathorn, D.D. (1997). Populations. *Social Problems*; *44*, 2.

Hedge, B., & Petrak, J.A. (1998).*Take as prescribed: a study of adherence behaviours in people taking anti-retroviral medications* [abstract 32346].Abstract Book. *Presented at the 12th World AIDS Conference; 28 June – 3 July,* 1998. Geneva: 590–591.

Hendershot, C.S., Stoner, S.A., Pantalone, D.W., & Simoni, JM. (2009). Alcohol use and antiretroviral adherence: review and meta-analysis. *Journal of Acquired Immune Deficiency Syndromes*, *52*, 180–202.

Hightow–Weidman, L., Jones, K., Wohl, F.D., Outlaw, A., Phillips, G., Hidalgo, J, & Giordano, T.P.A. (2011). Early linkage and retention in care: findings from the outreach, linkage, and retention in care initiative among young men of colour who have sex with men. *AIDS Patient Care STDS*, *25*(Suppl 1), S31–S38.

Hogg, R.S., Heatha, K., Bangsberg, D., Yipa, B., Pressa, N., Michael, V., … & Montanera J.(2002). Intermittent use of triple combination therapy is predictive of mortality at baseline and after 1 year of follow-up. *AIDS*, *16*(7), 1051–8.

Horstmann, E., Brown, J., Islam, F., Buck, J., & Agins, B. (2010). Retaining HIV-infected patients in care: Where are we? Where do we go from here? *Clinical and Infectious Diseases*; *50*, 752–761.

Howard, A.A., Arnsten, J.H., Lo, Y., Vlahov, D., Rich, J.D., Schuman, P., … & Schoenbaum, E.E.(2002). A prospective study of adherence and viral load in a large multi-centre cohort of HIV-infected women. *AIDS, 16*, 2175–2182.

Ickovics, J., & Meade, C. (2002). Adherence to HAART among patients with HIV: breakthroughs and barriers. *AIDS Care,14*, 309-318.

Ickovics, J., & Meisler, A. (1997). Adherence in AIDS clinical trials: a framework for clinical research and clinical care. *Journal of Clinical Epidemiology, 50*, 385–391.

Jina, F., Jansson, J., Lawa, M., Prestagea, G., Zablotskac, I., Imriec, J., … & Wilsona, D . (2010). Per-contact probability of HIV transmission in homosexual men in Sydney in the era of HAART.*AIDS, 24*, 907–13.

Kennedy, S., Goggin, K., & Nollen, N. (2004). *Adherence to HIV Medications*: Utility

Kenya National Bureau of Statistics, (2009). *Kenya Population and Housing Census*. Nairobi: KNBS.

Kessler, R.C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*, 593−602.

Krisda, H., Chaiyachati, O.O., Matthew, P., Amitabh, B., Suthar, E. Negussie, K. & Till, B. (2014). Interventions to improve adherence to antiretroviral therapy: a rapid systematic review. *AIDS*, *28*(suppl 2), S187-S204.

Kumarasamy, N., Safren, S.A., Raminani, S.R., Pickard, R., James, R., Krishnan, A.K.S., & Mayer, K.H. (2005). Barriers and facilitators to antiretroviral medication among patients with HIV in Chennai, India: A qualitative study. *AIDS Patient Care and STDs*; *19*(8), 526–537.

Lane, T., Mogale, T., Struthers, H., McIntyre, J., & Kegeles, S.M. (2008). They see you as a different thing: the experiences of men who have sex with men with healthcare workers in South African township communities. *Sexually Transmitted Infections, 84*, 430–433.

Laurent, C., Kouanfack, C., Laborde-Balen, G., Aghokeng, A.F., & Mbougua, J.B. (2011). Monitoring of HIV viral loads, CD4 cell counts, and clinical assessments versus clinical monitoring alone for antiretroviral therapy in rural district hospitals in Cameroon: a randomised non-inferiority trial. *Lancet Infectious Diseases, 11,* 825–833.

Link, B.G. & Phelan, J. (1995). Social conditions as fundamental causes of disease. *Journal of Health and Social Behaviour*. Spec No, 80-94.

Liu, H., Golin, C., Miller, L., Hays, R., Beck, C., Sanandaji, S., … & Wenger, N. (2001). A comparison study of multiple measures of adherence to HIV protease inhibitors. *Annals of Internal Medicine,134*, 968-977.

Lora, L., Sabin, M. B.D., Davidson, H., Hamer, X.K., Yuan, Y., Fan, W., & Christopher, J.G. (2008). Barriers to adherence to antiretroviral medications among patients living with HIV in southern China: a qualitative study. *AIDS Care*, *20*, 1242-1250.

Magnani, R., Sabin, K., Saidel, T., & Heckathorn, D. (2005). Review of sampling hard-to-reach and hidden populations for HIV surveillance. *AIDS, 19,* S67–S72.

Mai L, Eng J. Community-based elder care, (2007). A model for working with the marginally housed elderly. *Care Management Journals*, *8*(2), 96–99.

Malta, M., Magnanini, M.M., Strathdee, S.A., & Bastos, F.I. (2010). Adherence to antiretroviral therapy among HIV-infected drug users: a meta-analysis. *AIDS and Behaviour*; *14*, 731–747.

Marcia, M., James, E., Ernest, E., Melinda, H., Ilya, T., & Modupe, F. (2012). Motivational Groups Support Adherence to Antiretroviral Therapy and use of Risk Reduction Behaviors in HIV Positive Nigerian Women. A Pilot Study. African, *16*(3), 14–27.

Marks, G., Gardner, L., Craw, J., &Crepaz, N. (2010). Entry and retention in medical care among HIV-diagnosed persons: a meta-analysis. *AIDS*, *24*, 2665–2678.

Matthew, J., Steven, A., Sergiy, D., Sari, R., Richard, N., & George, W. (2010). We fear the police, and the police fear us": Structural and individual barriers and facilitators to HIV medication adherence among injection drug users in Kiev, Ukraine. *AIDS Care*, *22*(11), 1305–1313.

Melbourne, K., Geletko, S., Brown, S., Willey, C., Chase, S., & Fisher, A. (1998). *Electronic adherence assessment versus self-report in HIV-infected individuals* [abstractI-175]. In: Program and abstracts of the 38th Interscience Conference on Antimicrobial Agents and Chemotherapy (San Diego).Washington, DC: American Society for Microbiology.

Ministry of Health, (2011). *Health Facility Master List.* Nairobi: Ministry of Health.

Ministry of Health, (2012). *Kenya AIDS Indicator Survey*. Nairobi: Ministry of Health.

Ministry of Health, (2014). *Kenya AIDS Strategic Framework 2014/2015-2018/2019.* Nairobi: Ministry of Health.

Ministry of Health (2016). *Guidelines on Use of Antiretroviral Drugs for Treating and Preventing HIV Infection in Kenya*. Nairobi: Ministry of Health.

Ministry of Health, (2012). *Geographic Mapping of Most at Risk Populations for HIV in Kenya.* Nairobi: Ministry of Health.

Ministry of Health, (2014). *Policy Analysis and Advocacy Decision Model for services for Key Population.* Nairobi: Ministry of Health.

Ministry of Public Health and Sanitation (MOPHS), Kenya, (2010).*National Guidelines for HIV/STI Programmes for Sex Workers.* Nairobi: MOPHS.

Misra, A., & Ganda, O.P. (2007). Migration and its impact on adiposity and type 2 diabetes. *Nutrition, 23*(9), 696–708.

Mocroft, A., Ledergerber, B., Katlama, C., Kirk, O., Reiss, P., Arminio, D., & Lundgren, J.D., for the EuroSIDA study group. (2003). Decline in the AIDS and death rates in the EuroSIDA study: an observational study. *Lancet, 362,* 22-29.

Morisky, D.E., Green, L.W., & Levine, D.M. (1986). Concurrent and predictive validity of a Self-reported measure of medication adherence. *Medical Care, 24,* 67*–74.*

Mugavero, M., Davila, J., Nevin, C., & Giordano, T. (2010). From access to engagement: measuring retention in outpatient HIV clinical care. *AIDS Patient Care and STDS, 24,* 607–613.

Murphy, D.A., Wilson, C.M., Durako, S.J., Muenz, L.R., Belzer, M. (2001). Antiretroviral medication adherence among the REACH HIV-infected adolescent cohort in the USA. Adolescent Medicine HIV/AIDS Research Network. *AIDS Care, 13*(1), 27-40.

Nachega, J.B., Mills, E.J., & Schechter, M. (2010). Antiretroviral therapy adherence and retention in care in middle-income and low-income countries: current status of knowledge and research priorities. *Current Opinion in HIV and AIDS, 5,* 70–77.

National AIDS and STI Control Programme (NASCOP), (2013). *Kenya MARPs Size Estimation Consensus Report.* Nairobi: NASCOP.

National AIDS Control Council, (2013). *Kenya AIDS Progress Report*, Nairobi: National AIDS Control Council.

National AIDS Control Council (NACC). (2016). *Kenya AIDS Progress Report*. Nairobi: National AIDS Control Council.

National AIDS Control Council and National AIDS and STI Control Programme. (2012). *Know your HIV Status. The Kenya AIDS epidemic update*, Nairobi: National AIDS Control Council.

Ngoh, L.N. (2009). Health literacy: a barrier to pharmacist-patient communication and medication adherence. *Journal of American Pharmacy Association, 49*, 132–146.

Niewkerk, P., Gisolf, H., Van Leeuwen, R., Danner, S., DeBoer, J., & Sprangers, M. (1998). *Self-reported adherence to ritonavir/saquinavir and ritonavir/saquinavir/ stavudine in a randomized clinical trial: preliminary results* [abstract 32362]. In: Program and abstracts of the 12th World AIDS Conference. Geneva: Marathon Multimedia

O'Shea, S.D., Taylor, N.F., & Paratz, J.D. (2007). But watch out for the weather: Factors affecting adherence to progressive resistance exercise for persons with COPD. *Journal of Cardiopulmonary Rehabilitation and Prevention*; *27*(3), 166–174.

Okal, J., Mathew, F., Chersich, S.T., Elizabeth, S., Marleen, T., & Stanley, L. (2011). Sexual and physical violence against female sex workers in Kenya: Á qualitative enquiry. *AIDS Care*, *23*(5).

Onyango-Ouma, W., Birungi, H., & Geibel, S. (2006). Understanding the HIV/STI Risks and Prevention Needs of Men Who Have Sex with Men in Nairobi, Kenya. Nairobi: Horizons Final Report and Population Council.

Ortego, C., Huedo-Medina, T.B., Llorca, J., Sevilla, L., Santos, P., Rodriguez, E., Warren, M.R., & Vejo, J. (2011). Adherence to highly active

antiretroviral therapy (HAART): A meta-analysis. *AIDS Behaviour*, 15, 1381–1396.

Pal, B.B., Acharya, A.S., & Satyanarayana, K. (1999). Sero-prevalence of HIV infection among jail inmates in Orissa. *Indian Journal of Medical Research*, *109*, 199–201.

Paterson, D.L., Swindells, S., Mohr, J., Brester, M., Vergis, E.N., Squier, C., Wagener, M.M., & Singh, N. (2000). Adherence to protease inhibitor therapy and outcomes in patients with HIV infection, *Annals of Internal Medicine*, *133*(1), 21-30.

Patton, M.Q. (1990). *Qualitative Research and Evaluation Methods*. (2nd ed. Pp. 532). Newbury Park, CA: Sage Publications.

Peltzer, K., & Pengpid, S. (2013). Socioeconomic Factors in Adherence to HIV Therapy in Low- and Middle-income Countries. *Journal of Health, Population, and Nutrition*, *31*(2), 150–170.

Potcho, Y., Tchamdja, K., Balogou, A., Pitche, V., Guissou, I. P. & Kassang, E.K., (2010). Knowledge and adherence to antiretroviral therapy among adult people living with HIV/AIDS treated in the health care centres of the association Espoir Vie Togo, West Africa, *BioMed Central Clinical Pharmacology Journal*, *10*, 11.

Quinn, C., Wawer, M., Sewankambo, N., Serwadda, D., Chuanjun, L., Wabwire-Mangen, F., & Gray, R. (2000). Viral load and heterosexual transmission of human immunodeficiency virus type 1. Rakai Project Study Group.New*England Journal of Medicine*, *342*, 921–929.

Rabkin, J.G., & Chesney, M. (1999). *Treatment adherence to HIV medications: The Achilles heel of the new therapeutics*. In D. Ostrow and S. Kalichman (Eds.), New HIV therapies: Psychological and public health implications (pp. 61–82). New York: Plenum Press.

Rosen, S., Fox, M.P., & Gill, C.J. (2007). Patient retention in antiretroviral therapy programs in sub-Saharan Africa: a systematic review. *PLOS Medicine, 4*, e298.

Roter, D., Judith, A., Rolande, M., Beth, N., Deborah, C., & Bonnie, S. (1998). *Medical Care, 36*(8), 1138-1161.

Sanders, E.J., Graha, S.M., Okuku, H.S., Elst, E.M., Muhaari, A., Davies, A., & Smith, A.D. (2007). HIV-1 Infection in High Risk Men Who Have Sex with Men in Mombasa, Kenya. *AIDS, 21*(18), 2513-2520.

Sanon, A., Traoré, I., Diallo, R., Ouédraogo, A., Andonaba, J., Konate, I., … & Nagot, N. (2002). *Do commercial sex workers who discuss treatment with family and friends adhere to it better*? Burkina Faso: ProjetYerêlon/SHADEI, Centre Muraz, 01 BP 390 Bobo-Dioulasso.

Shalansky, S.J., Levy, A.R., Ignaszewski, A.P. (2004) Self-reported Morisky score for identifying nonadherence with cardiovascular medications. *Annals of Pharmacotherapy, 38,* 1363–*1368.*

Sharada, P., Padam, S., Julian, R., Jennifer, V., & Edwin, V. (2012). Barriers to and Facilitators of Antiretroviral Therapy Adherence in Nepal: A Qualitative Study. *Journal Health Population Nutrition, 30*(4), 410–419.

Sharma, A., Bukusi, E., Gorbach, P., Cohen, C.R., Muga, C., Kwena, Z., Holmes, K.K. (2008). Sexual identity and risk of HIV/STI among men who have sex with men in Nairobi. *Sexually Transmitted Diseases, 35*, 352–354.

Simoni, J.M., Amico, K.R., Pearson, C.R., & Malow, R. (2008). Strategies for promoting adherence to antiretroviral therapy: a review of the literature. *Current Infectious Diseases Reports, 10*(6), 515 - 21.

Simoni, J.M., Huh, D., & Frick, P.A. (2009). Peer support and pager messaging to promote antiretroviral modifying therapy in Seattle: A randomized

controlled trial. *Journal of Acquired Immune Deficiency Syndrome, 52*(4), 465–73.

Singh, N., Berman, S.M., Swindells, S., Justis, J.C., Mohr, J.A., Squier, C., & Wagener, M.M. (1999). Adherence of human immunodeficiency virus-infected patients to antiretroviral therapy. Clinical *29*(4), 824-30.

Smith, A.D., Tapsoba, P., Peshu, N., Sanders, E.J., & Jaffe, H.W. (2009). Men who have sex with men and HIV/AIDS in sub-Saharan Africa. *Lancet, 374*, 416–22.

Stone, V, Hogan, J., Schuman, P., Rompalo, A., Howard, A., Korkontzelou, C., & Smith, D. (2001). Antiretroviral regimen complexity, self-reported adherence, and HIV patients' understanding of their regimens: survey of women in the HER STUDY. Journal, *28*(2), 124-31.

Terblanche, L.M., & Stellenberg, E.L. (2014). Patient knowledge of HIV and its treatment in South Africa. *African Journal of Primary Health Care and Family Medicine*, *6*(1), E1–7.

Thiede, H., Romero, M., Bordelon, K., Hagan, H., & Murrill, C.S. (2001). Using a jail-based survey to monitor HIV and risk behaviors among Seattle area injection drug users. *Journal of Urban Health*, *78*, 264–278).

Turner, B.J. (2002).Adherence to antiretroviral therapy by human immunodeficiency virus-infected patients. *Journal of infectious Diseases, 185*(Suppl 2), S143-51.

UNAIDS (Joint United Nations Programme on HIV/AIDS), (2006). Report on the Global AIDS Epidemic. Retrieved from: http://data.unaids.org/pub/GlobalRepor t/2006/2006. Joint United Nations Programme on HIV/AIDS.

UNAIDS (Joint United Nations Programme on HIV/AIDS). (2010) Report on the Global AIDS Epidemic. Retrieved from: http://www.unaids.org/en/

media/unaids/ ontentassets/documents/unaidspublication/2010/20101123 _globalreport_en.pdfen.

UNAIDS (Joint United Nations Programme on HIV/AIDS). (2011). UNAIDS Terminology Guidelines. Joint United Nations Programme on HIV/AIDS. Retrieved from: http://www.unaids.org/en/media/unaids/ contentassets/documents/document/2011/20111009_UNAIDS_ Terminology _ Guidelines_MidtermAdditions_en.pdf

UNAIDS (Joint United Nations Programme on HIV/AIDS). (2014). Global AIDS Progress Report. Retrieved from: thttp://www.unaids.org/ en/media/unaids/ contentassets/documents/unaidspublication/2014 /unaids _gap_report_en.**pdfe**

UNAIDS (Joint United Nations Programme on HIV/AIDS). (2016).Global AIDS retrieved from: http://www.unaids.org/sites/default/files/media _asset/ global-AIDS-update-2016_en.pdf

UNAIDS (Joint United Nations Programme on HIV/AIDS). (2017).Global AIDS Report, UNAIDS

Vernazza, P., Bernard, H., Enos, B., & Flepp, M. (2008). Les personnes séropositives ne souffrant d'aucune autre MST et suivant un traitement antirétroviral efficace ne transmettent pas le VIH par voie sexuelle. *Bulletin des médecins suisses Schweizerische Ärztezeitung Bollettino dei medici svizzeri, 89*, 5.

Vitolins, M. Z., Rand, C. S., Rapp, S.R., Ribisl, P.M. & Sevick, M.A. (2000). Measuring adherence to behavioural and medic interventions. *Controlled Clinical Trials Journal,* 21, 188S-194S.

Wandera, B., Kamya, M.R., Castelnuovo, B., Kiragga, A., & Kambugu, A. (2011). Sexual behaviors over a 3-year period among individuals with advanced HIV/AIDS receiving antiretroviral therapy in an urban HIV clinic in

Kampala, Uganda. *Journal of Acquired Immune Deficiency Syndromes, 57*(1), 62-8.

Weiser, S., Wolfe, W., Bangsberg, D., Thior, I., Gilberg, P., Makhema, J., & Marlink, R. (2003). Barriers to antiretroviral adherence for patients living with HIV infection and AIDS in Botswana. *Journal of Acquired Immune Deficiency Syndromes, 34*(3), 281–288.

Weiser, S.D., Frongillo, E.A., Ragland, K., Hogg, R.S., & Riley, E.D. (2009). Food insecurity is associated with incomplete HIV RNA suppression among homeless and marginally housed HIV-infected individuals in San Francisco. *Journal of General and Internal Medicines, 24*, 14–20.

Wilson, D.P., Law, M.G., Grulich, A.E., Cooper, D.A., & Kaldor, J.M. (2008). Relation between HIV viral load and infectiousness: a model-based analysis. *Lancet, 372*, 314–320.

World Bank, (2007). *Legal Aspects of HIV/AIDS: A Guide for Policy and Law Reform*. Geneva: WB.

World Health Organization, (2003). *Adherence to long-term therapies: Evidence for action.* Geneva, Switzerland: WHO.

World Health Organization. (2006). *World health report*. Geneva, Switzerland: WHO.

World Health Organization. (2011). *Prevention and treatment of HIV and other sexually transmitted infections among men who have sex with men and transgender people: recommendations for a public health approach*. Geneva: WHO Press.

World Health Organization. (2016). *Prevention and treatment of HIV and other sexually transmitted infections among men who have sex with men and transgender people: recommendations for a public health approach*. Geneva WHO Press.

Zweben, A., & Zuckoff, A. (2002). Motivational interviewing and treatment adherence. In W. R. Miller & S. Rollnick (Eds.), *Motivational interviewing: Preparing people for change* (2nd Ed.). New York: Guilford Press.

APPENDICES

Appendix 1: Ethical clearance Letter

APPENDIX H: KNH/UON Ethical Review Committee Clearance Letter

11 MAY 2015

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
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KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/215

11th May, 2015

Ruth Laibon
TM410-009/343
JKUAT

Dear Ruth

Research Proposal : Determinants of treatment Adherence among Male Sex workers on antiretroviral therapy on Nairobi County, Kenya (P72/02/2015)

This is to inform you that the KNH/UoN-Ethics & Research Committee (KNH/UoN-ERC) has reviewed and approved your above proposal. The approval periods are 11th May 2015 to 10th May 2016.

This approval is subject to compliance with the following requirements:

a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
f) Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
g) Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN ERC website www.erc.uonbi.ac.ke

Yours sincerely,

PROF. M'M. CHINDIA
SECRETARY, KNH/UON-ERC

c.c. The Principal, College of Health Sciences, UoN
The Deputy Director CS, KNH
The Chair, KNH/UoN-ERC
Supervisors: Dr. Michael Kiptoo, Dr. Kenneth Ngure

Appendix 2: Explanation for Consent to Participate

Introduction of the study to the research participants //NYONGEZA: Habari ya mshiriki

This information sheet is to be read out clearly to the participant by the interviewer before conducting interviews// Karatasi hii yenye maelezo inafaa kusomwa Kwa uwazi kwa mshiriki na anaye hoji kabla ya kuanza mahojiano

STUDY TITLE: Determinants of ART Treatment Adherence among Male Sex Workers in Nairobi County, Kenya

:// *JINA LA UTAFITI: Visababishi vya uzingatiaji wa matibabu ya ART kati ya waume wanaofanya kazi ya ukahaba katika Kaunti ya Nairobi, Kenya*

INTRODUCTION:// *Kitambulishi*

Hello! My name is …….. I am conducting a study on determinants of HIV treatment adherence among male sex workers in Nairobi County, Kenya. I would like to **invite** you to consider participating in this study. The Principal Investigator of this study is Ruth Laibon from the Institute of Tropical Medicine and Infectious Diseases, Jomo Kenyatta University of Agriculture and Technology.// *Hujambo! Jina langu ni.....ninafanya utafiti wa visababishi vya uzingatiaji wa matibabu ya HIV kati ya waume wanaofanya kazi ya ukahaba katika Kaunti ya Nairobi, Kenya. Ningependa **kukualika** utafakari kushiriki katika utafiti huu. Kiongozi mkuu wa utafiti huu ni Ruth Laibon kutoka Idara yaUtafiti ya Mandawa na Magonjwa ya Kuambukiza, Chuo kikuu cha Kilimo na Teknolojia cha Jomo Kenyatta*

HIV and AIDS pandemic is a global concern affecting all nations and communities of the world. Globally men who have sex with men (MSM) are 19 times more likely to be living with HIV than the general population. In Kenya, male sex workers plays a notable role in the AIDS epidemic and those living with HIV face unique challenges due to social, cultural and religion intolerance that may affect their

treatment adherence. In management of HIV, patient adherence to antiviral regimens is one of the greatest challenges to achieving treatment goals. // *Janga la HIV/AIDS ni jambo ambalo limeadhiri mataifa yote na jamii ulimwenguni. Ulimwenguni, waume wenye kufanya ngono na waume (MSM) wana uwezekano wa hadi mara kumi na tisa kuwa wanaishi na HIV kuliko wananchi wa kawaida. Nchini Kenya, waume wanaofanya kazi ya ukahaba huendeleza wajibu muhimu kwenye janga la AIDS na wanaoishi na HIV hukumbwa na changamoto zitokanazo na ukosefu wa kuvumilia kwenye jamii, tamaduni na dini, jambo linaloweza kuadhiri uzingatiaji wa matibabu yao. Katika ushughulikiaji wa HIV, mgonjwa kuzingatia matibabu ni mojawapo ya changamoto ya kufanikiwa katika malengo ya matibabu.*

PURPOSE OF THE STUDY: The purpose of this study is to determine the factors that influence ART treatment adherence among male sex workers in Nairobi County, Kenya in order to facilitate the development of appropriate interventions. //***MADHUMUNI YA UTAFITI****: Madhumuni ya utafiti huu ni kuchunguza sababu zinazoadhiri matibabu ya ART kati ya waume wanaofanya kazi ya ukahaba kwenye Kaunti ya Nairobi, Kenya, ili kuwezesha uendelezaji wa mikakati inayofaa.*
Ufunguzi

Informed Consent// *Idhini iliyojulishwa*

Before agreeing to participate, I would like to provide you with important information on the study. I will read out aloud the information on the study to help you to decide if you would like to participate. You should fully understand what is involved before you agree to take part in this study. // *Kabla hujakubali kushiriki, ningependa kukupa maelezo muhimu kuhusu utafiti huu. Nitasoma kwa sauti maelezo kuhusu utafiti ili kukusaidia kuamua kama ungependa kushiriki. Unafaa kuelewa kwa kikamilifu kinacho endelea au kuhitajika kabla hujakubali kushiriki kwenye utafiti huu.*

1. If you have any questions, please do not hesitate to ask me. // *Kama una maswali yoyote, tafadhali usisite kuniuliza*
2. You should not agree to take part unless you are satisfied about all the procedures involved.//*Hufai kukubali kushiriki kama hujaridhirika na taratibu zinazohusika*

3. Please be completely truthful with me regarding all the information I may ask you. //*Tafadhali kuwa na uwazi kuhusu habari zote nitakazo kuuliza*
4. If you decide to take part in this study, I will ask you to choose to confirm agreement either by **SIGNING** this consent form. I will give you a copy of this information sheet and consent form to keep for further reference.//*Ukikubali kushiriki katika utafiti huu, nitakuuliza udhibitishe kukubali kwa* ***kuweka sahihi*** *kwenye fomu hii ya kutoa idhini*

May I continue?// **Naweza Kuendelea?**

Yes// *Ndio*……1

No// *La*……..2

(For the Interviewer: If the participant does not wish to receive additional information on the study, thank the participant and ask him/her what the concerns are. If the potential participant is still not interested in further information about the study, thank him/her and stop the interview).

// ***(Kwa anaye hoji****: Kama anayeshiriki hataki kupata habari zaidi kuhusu utafiti, mshukuru na umuulize hofu ni zipi. Kama mshiriki mtarajiwa bado havutiwi na habari zaidi kuhusu utafiti, mshukuru na utamatishe mahojiano).*

STUDY PROCEDURES: This is a social science study. No medicine or intrusive procedure is involved. As part of the study, I will ask you questions about your background access to and utilisation of ART treatment services, as well as any obstacles or challenges you experience in obtaining accessing treatment. I will record your answers on the questionnaire. In addition, after completing the interview, I will require HIV treatment history data from the health facilities where you receive regular care. Your name will not be used on any of the data collection tools, including the medical history data extraction tool, making it impossible for your identity to be disclosed to anyone else outside of the study team.

// ***TARATIBU ZA UTAFITI****: Huu ni utafiti wa kisayansi ya kijamii. Hakuna madawa au taratibu za kindani zinazohusika. Kama sehemu ya utafiti huu,*

nitakuukiza maswali kuhusu vile unavyopata na kutumia huduma za kimatibabu za ART, na vilevile kuhusu vizuizi au changamoto katika kupata matibabu. Nitanakili majibu yako kwenye dodoso. Pia, baada ya kumaliza mahojiano, nitahitaji habari za historia yako ya matibabu ya HIV kutoka kwa vituo vya afya ambavyo wewe hupokea matibabu mara kwa mara. Jina lako halitatumika katika vifaa vyovyote vya kunakili habari kikiwapo kifaa cha kuchukua habari ya historia ya kiafya, kwa hivyo haitawezekana kukutambulisha kwa mtu yeyyote asiyehusika katika utafiti huu.

RISKS OF TAKING PART: This study does not pose any physical danger to you. However, you may experience emotional discomfort and psychological distress from answering questions on some of your personal experiences. If needed, I will provide you with details of places where you can receive professional help after the interview.

//***HATARI ZA KUSHIRIKI****: Utafiti huu hauna madhara yoyoye ya kimaungo kwako. Hata hivyo, unaweza kupata hisia zisizo za raha na hisia za kisaikolojia za kuudhi kutokana na kujibu baadhi ya maswali yanayoguzia uzoefu wa kibinafsi. Ikitakikana, nitakupa maelezo kamili ya mahala unaweza kupokea huduma za kitaalam baada ya mahojiano.*

POSSIBLE BENEFITS: There are no direct benefits to you for participating in this study. You will not be paid to participate in this study. However, you may benefit indirectly through improved services that may result from the findings of this study.

// ***MANUFAA YANAYOWEZEKANA:*** *Hakuna manufaa ya moja kwa moja kwako kwa kushiriki katika utafiti huu. Hautapokea malipo kutokana na kushiriki katika utafiti huu. Hata hivyo, unaweza kupata manufaa yasiyo ya moja kwa moja kwa kupokea huduma bora zaidi zinazoweza kutokana na matokeo ya utafiti huu.*

CONFIDENTIALITY: All information obtained during the course of this study will be kept strictly confidential. The interviews will be private and not shared with anyone. Your name will not be written on any data collection forms, making it impossible for anyone else to directly link the information to you.

//***USIRI:*** *Habari zote zitakazonakiliwa kutokana na utafiti huu zitawekwa kwa usiri wa hali ya juu. Mahojiano yatakuwa ya kibinafsi na hayatapokezwa kwa yeyote. Jina lako halitanakiliwa kwa vifaa vyovyote vya kuchukuliwa habari na kwa hivyo haitawezekana kuunganisha habari kwako moja kwa moja.****Kubanwa kwa utafiti***

YOUR RIGHTS AS A STUDY PARTICIPANT AND CONTACT INFORMATION: Your participation in this study is entirely voluntary and you can decline to participate, or stop at any time, or decline to answer any question without stating any reason. If you have any further questions on your rights as a study participant, you may also address them to the University of Nairobi/Kenyatta National Hospital Research and Ethics Review Committee, whose are provided in this information sheet.

//***HAKI ZAKO KAMA MSHIRIKI WA UTAFITI HUU NA HABARI ZA KUKUFIKIA:*** *Ushiriki wako katika utafiti huu ni wa huru kabisana unaweza kukataa kushiriki au kuacha kushiriki wakati wowote, au kukataa kujibu swali lolote bila kutoa maelezo. Kama una swali lolote kuhusu haki zako kama mshiriki wa utafiti huu, unaweza pia kuyaelekeza kwa chuo kikuu cha Nairobi. Kamitii ya Kenyatta National Hospital Research and Ethics Review, na habari zao za kuwafikia zimepeanwa katika karatasi hii ya habari.* ***Habari ya mshiriki***

Appendix 3: Consent by the Study Participant

INFORMED CONSENT FOR STUDY PARTICIPANT: //*IDHINI ILIYOJULISHWA KWA MAHOJIANO YA MSHIRIKI WA UTAFITI*

- I hereby confirm that I have been informed by the researcher, ...*(NAME OF RESEARCHER),* about the nature, conduct, benefits and risks of this study: **"Determinants of treatment adherence Male Sex Workers**.// *Ninahakikisha kuwa nimeelezwa na anayehoji/ mtafiti,.....(JINA LA ANAYEHOJI) kuhusu asili, uendeshaji, manufaa na hatari za utafiti:* ***Visababishi vya uzingatiaji wa matibabu ya waume wanaofanya kazi ya ukahaba***
- I have also understood the written information regarding the study.// *Pia, nimeelewa habari zilizo andikwa kuhusu utafiti huu*

By **SIGNING** this consent form I agree to be interviewed for the study and for my HIV treatment history to be obtained from my regular health facility. However, I may, at any stage, and with no prejudice, withdraw my consent and participation in the study.// *Kwa kuweka sahihi katika fomu hii ya idhini, ninakubali kuhojiwa kwa utafiti huu na historia yangu ya matibabu ya HIV kuchukuliwa kwenye kituo cha afya ninakokwenda kupata matibabu mara kwa mara. Hata hivyo, katika wakati wowote, na bila ubaguzi, ninaweza kuitoa idhini yangu ya kutoshiriki katika utafiti huu.*

PARTICIPANT SIGNATURE (WRITTEN CONSENT):// ***SAHIHI YA MSHIRIKI*** *(IDHINI ILIYO ANDIKWA)*

Printed Name **Signature / Mark or Thumbprint** **Date and Time**

//***Jina lililo chapishwa*** ***Sahihi/ alama ya kidole*** ***Tarehe/Wakati***

I, ...(Name of RESEARCHER), hereby confirm that the above participant has been fully informed about the nature, conduct and risks of the above study// *Mimi..... (jina la ANAYEHOJI), nahakikisha kuwa mshiriki alitajwa ameelezwa kikamilifu kuhusu asili, uendeshaji, manufaa na hatari za utafiti huu*

Contact Information // *Habari za kuwasiliana*

The Principal Investigator for this study is Ms Ruth Laibon. You may ask any questions you have now, or if you have any questions later, you are encouraged to contact her through mobile telephone number: 0722 200790, or Email – rlaibon@gmail.com

// *Kiongozi mkuu wa utafiti huu ni Ruth Laibon. Unaweza kuuliza maswali yoyote uliyo nayo sahii au kama utakuwa na swali badaaye, unahimizwa kuwasiliana naye kupitia nambari ifuatayo ya simu ya rununu: 0722 200790 au barua pepe:* rlaibon@gmail.com

If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher (s), you are encouraged to contact the following:

// **Maswali na watao ya jibu***Ikiwa una maswali yoyote kuhusu utafiti huu na ungependa kuongea na mtu mwigine asiye mtafiti/ anayehoji, unahimizwa uwasiliane na wafuatao:Ikiwa una maswali yeyote kuhusu utafiti huu na ungependa kuuliza swali kwa mtu mwingine isipokuwa mtafiti, unahimizwa ujulishe:*

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You will be given a copy of this form to keep for your records.// *Utapewa nakala ya fomu hii ili kuweka kama kumbukumbu.*

Appendix 4: Questionnaire

APPENDIX 4 :
QUESTIONNAIRE//*dodoso* - Treatment Adherence among Male Sex Workers in Nairobi Kenya// *Uzingatiaji wa matibabu kati ya waume wanaofanya kazi ya ukahaba Nairobi nchini Kenya*SECTION A: INTERVIEW INFORMATION// *SEHEMU A: HABARI YA MAHOJIANO*

Serial Number// *Nambari ya sanjari* _____ ☐☐☐

PSU Name and code// *Jina na alama fiche ya PSU*_____ ☐☐☐☐

Name of District // *Jina la Wilaya*_____

Name of District: *Jina la Wilaya1-Westlands; 2-Kasarani; 3-Embakasi; 4-Makadara; 5-Kamukunji; 6-Starehe; 7-Dagoretti; 8-Lang'ata*

Name and code of interviewer// *Jina na alama fiche ya anaye hoji*: _____ ☐☐

Date of interview: //*Tarehe ya mahojiano* DAY//*SIKU* ☐☐ MONTH// *MWEZI* ☐☐ YEAR// *MWAKA* ☐☐☐☐

Completion Status// *Hali ya ukamilifu*…… ☐

Completed interview // *Mahojiano kamilifu* = 1
Did not complete interview// *Mahojiano hayakukamika* = 2
Not eligible (Specify) // *Asiyefaa kushiriki (fafanua)* = 3 _____
Refused// *Amekataa* = 5

SECTION B: EDITING AND DATA ENTRY // *SEHEMU B: KUHARIRI NA KUINGIZA DATA*

Name and code of Supervisor:// *Jina na alama fiche ya msimamizi* _____ ☐

Date of scrutinizing the questionnaire:
// *Tarehe ya kuchunguza dodoso*DAY// *SIKU*MONTH// *MWEZI*YEAR// MWAKA ☐☐ ☐☐ ☐☐☐☐

Signature of Supervisor// *Sahihi ya msimamizi*_____

Name and code of Data Entry Person:// *Jina na alama fiche ya anaye ingiza data*_____ ☐

Date of data entry// *Tarehe ya kuingiza data*: DAY// *SIKU*MONTH// *MWEZI*YEAR// MWAKA ☐☐ ☐☐ ☐☐☐☐

Signature of Data Entry Person:// *Sahihi ya anayeingiza data*_____

SECTION I. SOCIO-DEMOGRAPHIC AND -ECONOMIC PROFILE // *SEHEMU 1: VITAMBULISHI VYA KIJAMII, JIOGRAFIA NA KIUCHUMI*

NO.	QUESTIONS// *MASWALI*	CODING CATEGORIES// *VIKUNDI VYA ALAMA FICHE*	SKIP//*KURUKA*
101	In which year were you born?// *Ulizaliwa mwaka gani?*	☐☐☐☐ YEAR BORN// *MWAKA WA KUZALIWA* DON'T KNOW// *SIJUI*..... 98	

102	What is the highest grade/level that you completed in school?// *Je, gredi au kiwango chako cha elimu ya hali ya juu uliyokamilisha ni ipi?*
	
	{CIRCLE ONE ONLY} // *{ZUNGUSHIA MOJA PEKEE}*
		None// *Hakuna*
		No education// *Hana elimu yeyote*..... 0
		Primary// *Msingi*
		Secondary// *Sekondari*
		College// *Chuo*
		CURRENTLY ENROLLED// *ANAENDELEA* 15
		COMPLETED// *AMEMALIZA*..... 16
		University// *Chuo kikuu*
		CURRENTLY ENROLLED// *ANAENDELEA* 17
		COMPLETED// *AMEMALIZA*..... 18
		Post-Graduate// *Masomo ya baada ya kuhitimu*
		CURRENTLY ENROLLED// *ANAENDELEA* 19
		COMPLETED// *AMEMALIZA*..... 20
		Other// *Nyingine*
		OTHER (SPECIFY)// *NYINGINE (FAFANUA)* 21
		**(specify)// *Fafanua*_____	

103	What is your current marital status?// *Je, hali yako ya ndoa ni ipi?*	NEVER MARRIED// *SIJAWAHI OA/OLEWA* → 1 CURRENTLY MARRIED TO A MAN// *NIMEOLEWA NA MWANAMME*..... 2	**104**

		CURRENTLY MARRIED TO A WOMAN// *NIMEOA MWANAMKE*..... 3 DESERTED/SEPARATED/DIVORCED// → *TUMETENGANAKUTALIKI*..... 4 WIDOWED// *MJANE* 5	**104**
104	Do you currently cohabit with a man? // *Je, kwa sasa unaishi na mwanamme?* **Ask only if the respondent is Never married / Deserted/Separated/ Divorced/Widowed // *Uliza tu kwa mshiriki ambaye hajawahi oa/olewa/ametengana/ mjane***	NO// *NDIO*..... 0 YES// *LA*..... 1	
105	When did you start living in Nairobi? // *Je, ulianza kuishi Nairobi lini?*	Year// *Mwaka*: ☐☐☐☐ Month// *Mwezi*: ☐☐ DON'T KNOW/NO ANSWER// *SIJUI/ HAKUNA JIBU* 99	
106	How many people live in your household?// *Je, ni watu wangapi wanaoishi katika nyumba yako?*	NUMBER OF HOUSEHOLD MEMBERS// *NAMBARI YA WANAOISHI KWENYE NYUMBA*	☐☐
107	Do you have children of your own?// *Je, una watoto wako binafsi?*	NO// *LA*..... 0 → YES// *NDIO*..... 1	

NO.	QUESTIONS// *MASWALI*	CODING CATEGORIES// *VIKUNDI VYA ALAMA FICHE*	SKIP//*KURUKA*
108	Average total monthly income for household in Kshs.// *Mapato ya wastani ya nyumba katika Ksh.* *(Kiazi cha pesa mnasopata kila mwezi ni shilingi ngapi?)*	<1000…… 1 1001 – 5000 ....2 5001 - 10000 ..... 3 > 10000 ....4 Don't Know// *Sijui* …… 5	
109	What is your main source of income to support your livelihood? // *Je, kiini chako kikuu cha mapato ya kijikimu ni kipi?*	SEX WORK// *UKAHABA* ..... 1 SMALL-BUSINESS ACTIVITY// *SHUGHULI KIDOGO ZA KIBIASHARA*..... 2 WORK AS A CASUAL LABOURER// *MFANYIKAZI WA MALIPO DUNI* ..... 3 SALARIED EMPLOYEE// *MFANYI KAZI WA KULIPWA MSHAHARA* ..... 4 STUDENT// *MWANAFUNZI* ..... 5 ANY OTHER (SPECIFY)// *NYINGINE (FAFANUA)*_____ 96	
110	What is your average weekly expenditure on food?// *Je, kwa wiki, matumizi yako ya wastani kwa chakula ni yapi?*	WEEKLY FOOD EXPENDITURE// *MATUMIZI YA CHAKULA KWA WIKI* ☐☐☐☐☐	

		DON'T KNOW/NO ANSWER// *SIJUI/ HAKUNA JIBU* 99	
111	What is the principal material used for the wall of your house?// *Je, kuta za nyumba yako zimetengenezwa kwa kutumia maunzi yapi?*	CONCRETE/STONE/BLOCK/BRICK// *SIMITI/ MAWE/MATUFALI* ..... 1 IRONSHEET// *MABATI* ..... 2 WOOD// *MBAO* ..... 3 POLYTHENE/PAPER/RUGS// *NAILONI/ KARATASI/ VIJITAMBAA* ..... 4 SOIL// *UDONGO* ..... 5 OTHER *(SPECIFY)// NYINGINE (FAFANUA)*	
112	Do you own a mobile phone?// *Je, una simu ya rununu?*	NO// *LA* ..... 0 YES// *NDIO* 1	
113	What is your religion?// *Je, dini yako ni ipi?* ***If respondent answers "Christian," ask "Are you Catholic or Protestant?"// kama mshiriki ni Mkristo, uliza, "je, wewe ni Mkatoliki au Mprotestanti?"***	MUSLIM// *MWISLAMU* ..... 1 CATHOLIC// *MKATOLIKI* ..... 2 PROTESTANT// *MPROTESTANTI* ..... 3 HINDU// *MHINDU* ..... 4 NO RELIGION// *ASIYE NA DINI* ..... 5 OTHER (SPECIFY)// *NYINGINE (FAFANUA)* _____ 96	

SECTION II: SEX WORK // *SEHEMU II: KAZI YA UKAHABA*

NO.	QUESTIONS// *MASWALI*	CODING CATEGORIES// *VIKUNDI VYA ALAMA FICHE*	SKIP//*KURUKA*
201	Have you ever received gift/materials in exchange for sex?// *Je, umewahi kupokea zawadi au vifaa vingine kama mabadilishano ya ngono?*	NO// *LA* ..... 0 → YES// *NDIO* 1	301
202	How long ago was the last time you received gift/materials in exchange of sex?// *Ni kama muda gani uliopita ambapo ulipokea zawadi au vifaa vingine kama mabadilishano ya ngono?* **Record "00" IF LESS THAN ONE MONTH// *Nakili "00" KAMA NI CHINI YA MWEZI MMOJA***	MONTHS// *MIEZI* ..... 1 ☐☐ YEARS// *MIAKA* ..... 2 ☐☐	
203	What was your main reason for exchanging sex for gifts/materials?// *Je, sababu yako kuu ya kubadilisha zawadi/ vifaa vingiine na ngono ilikuwa ipi?*	……	
204	With how many different men have you exchanged sex for gifts/ materials in the past 3 months?// *Je, ni wanaume wangapi tofauti ambao umebadilisha ngono kwa zawadi/vifaa vingine kwa miezi mitatu iliyopita?*	NUMBER OF MEN// *NAMBARI YA WANAUME* ☐☐	
205	Are you a sex worker?// *Je, wewe unafanya kazi kama kahaba?*	NO// *LA* ..... 0 → YES// *NDIO* 1	**301**

206	What was the main reason for you to get into sex work?// *Je, sababu yako kuu ya kufanya kazi ya ukahaba ni gani?*	NO SOURCE OF INCOME/NO MONEY TO BUY FOOD/NO SHELTER TO LIVE// *SINA MAPATO/PESA ZA KUNUNUA CHAKULA/MAHALI PA KUISHI*.....01 NO PHYSICAL SECURITY FOR BEING DESERTED/WIDOWED// *SINA MAHALI PA KUPATA USALAMA BAADA YA KUTENGANA/ KUWA MJANE*.....02 TO SUPPLEMENT FAMILY INCOME// *ILI KUONGEZA MAPATO YA FAMILIA*.....03 TO MEET IMMEDIATE MEDICAL OR OTHER EMERGENCIES IN FAMILY OR FOR HIMSELF // *ILI KUSHUGHULIKIA MATIBABU YA PAPO HAPO AU MAMBO MENGINE YA DHARURA YA FAMILIA*.....04 TO MEET PERSONAL EXPENSES// *ILI KUTIMIZA MATUMIZI YA KIBINAFSI*.....05 DECEIVED INTO SEX WORK// *NILIDANGANYWA KUINGILIA KAZI YA UKAHABA*.....06 FORCIBLY BROUGHT TO SEX WORK// *NILILETWA KUFANYA KAZI YA UKAHABA KWA LAZIMA*... 07 FORCED BY PARTNER/FAMILY MEMBERS TO EARN MONEY// *NILILAZIMISHWA NA MWENZI/ FAMILIA KUCHUMA PESA*.08 PRESSURIZED/HAD TO PAY BACK SOMEONE WITH SEXUAL FAVOUR// *NILILAZIMISHWA/ LAZIMA NINGEMLIPA MTU FULANI KWA FADHILA YA NGONO*.....09 OTHER (SPECIFY)// *NYINGINE*	

		*(FAFANUA)*_____ 96 NO ANSWER// *HAKUNA JIBU* 99	
207	For how long have you been doing sex work in Nairobi?// *Je, umefanya kazi ya ukahaba hapa Nairobi kwa muda gani?*	MONTHS// *MIEZI*..... 1 ☐☐ YEARS// *MIAKA*.....2 ☐☐	
208	How many sexual partners did you have on:// *Je, ulikuwa na wenzi wangapi wa ngono katika:* a. Last day of work?// *Siku ya mwisho ya kazi* b. Last week of work? // *Wiki ya mwisho ya kazi*	NUMBER ON LAST DAY ☐☐ //*NAMBARI KATIKA SIKU YA MWISHO* NUMBER ON LAST WEEK ☐☐ // *NAMBARI KATIKA WIKI YA MWISHO* DON'T REMEMBER// *SIKUMBUKI* 98 NO ANSWER// *HAKUNA JIBU* 99	
209	How many days do you practice sex work in a:// *Je, unafanya kazi ya ukahaba kwa siku ngapi katika* a. Typical week?// *Wiki ya kawaida* b. Typical month?// *Mwezi wa kawaida*	# OF DAYS IN A TYPICAL WEEK ☐☐ //*# YA SIKU KATIKA WIKI YA KAWAIDA* # OF DAYS IN A TYPICAL MONTH ☐☐ //*# YA SIKU KATIKA MWEZI WA KAWAIDA* DON'T REMEMBER// *SIKUMBUKI* 98 NO ANSWER// *HAKUNA JIBU* 99	

SECTION III: KNOWLEDGE AND ATTITUDES TOWARDS HIV and AIDS // *SEHEMU III: MAARIFA NA MIELEKEO KWENYE HIV NA AIDS*

NO.	QUESTIONS// *MASWALI*	CODING CATEGORIES// *VIKUNDI VYA ALAMA FICHE*	SKIP// *KURUKA*
301	When did you take your HIV test? // *Je, ulifanyiwa uchunguzi wa HIV lini?* **Record in Months here // *Nakili miezi hapa*** **RECORD "00" IF LESS THAN ONE MONTH// *NAKILI "00" KAMA CHINI YA MWEZI MMOJA***	LESS THAN A YEAR AGO// *CHINI YA MWAKA MMOJA ULIOPITA* ..... 0 MORE THAN A YEAR AGO// *ZAIDI YA MWAKA MMOJA ULIOPITA* ..... 1 DON'T REMEMBER// *SIKUMBUKI* ..... 98 NO ANSWER// *HAKUNA JIBU* 99	
302	Where did you take the HIV test?// *Je, ulifanyiwa uchunguzi wa HIV wapi?*	GOVERNMENT HEALTH FACILITY /VCTC// *KITUO CHA SERIKALI/ VCTC* ..... 1 PRIVATE HEALTH FACILITY// *KITUO CHA AFYA CHA KIBINAFSI* ..... 2 SPECIAL CLINIC FOR MSM/MSW// *KLINIKI MAALUM YA MSM/MSW* ..... 3 OTHER (SPECIFY)// *NYINGINE (FAFANUA)* ..... 4 NO ANSWER// *HAKUNA JIBU* 99	
303	What made you decide to go for HIV test?// *Je, ni kwa nini uliamua kwenda kufanyiwa uchunguzi wa HIV?*	SELF-PERCEPTION OF RISK// *NILIHISI NIKO HATARINI* 1 WAS UNWELL// *NILIKUWA NA MAUMIVU* ..... 2 REFFERED BY DOCTOR NURSE// *NILITUMWA NA DAKTARI/NESI*…….3 CAMPAIGN MESSAGES// *JUMBE ZA KAMPENI*.. 4 OTHER (SPECIFY)// *NYINGINE (FAFANUA)* ..... 5 NO ANSWER// *HAKUNA JIBU* 99	
304	Have you disclosed your HIV positive status to anyone other than the health provider?// *Je, umemweleza mtu yeyote kuhusu hali yako ya HIV isipokuwa mhudumu wa afya?*	NO// *LA* ..... 0 YES// *NDIO* 1	
305	Could you please tell me if the following statements are true or false?// *Je, unaweza nieleza kama matamko haya ni kweli au uongo?*		

	A. HIV medications (ARVs) cure to HIV// *Madawa ya HIV (ARVs) huponya HIV*	TRUE// *UKWELI* ..... 1 FALSE// *UONGO* 2	
	B. If HIV patients feel well, they would stop taking their medications// *Wagonjwa wa HIV wakijiskia nafuu wanaweza kuwacha kutumia madawa*	TRUE// *UKWELI* ..... 1 FALSE// *UONGO* 2	
	C. It is difficult for HIV patients to take their medications daily// *Ni vigumu kwa wagonjwa wa HIV kuyanywa madawa kila siku*	TRUE// *UKWELI* ..... 1 FALSE// *UONGO* 2	
	D. HIV patients have problems complying with their treatment if they live far from the clinics// *Wagonjwa wa HIV hupata shida kufuata matibabu waliyopewa kama wanashi mbali na kliniki*	TRUE// *UKWELI* ..... 1 FALSE// *UONGO* 2	
	E. HIV medications (called antiretroviral drugs or ARVs) can also be used to help someone avoid being infected with HIV after being exposed (i.e. post-exposure prophylaxis or PEP)?// *Madawa ya HIV (yaitwayo antiretroviral drugs au ARVs) yanaweza kutumika kusaidia mtu asiambukizwe na HIV baada ya kuwa kwenye hatari ya kuambukizwa (yaani, post-exposure prophylaxis au PEP)*	TRUE// *UKWELI* ..... 1 FALSE// *UONGO* 2	

SECTION IV: ACCESS TO ANTIRETROVIRAL THERAPY// *SEHEMU IV: NJIA ZA KUPATA MATIBABU*

NO.	QUESTIONS// *MASWALI*	CODING CATEGORIES// *VIKUNDI VYA ALAMA FICHE*	SKIP// *KURUKA*
401	When did you start taking ARVs?// *Je, ulianza kutumia madawa ya ARVs kuanzia lini?* **Record in Months here // *Nakili miezi hapa*** **RECORD "00" IF LESS THAN// *NAKILI "00" KAMA CHINI YA MWEZI MMOJA***	LESS THAN A YEAR AGO// *CHINI YA MWAKA MMOJA ULIOPITA* ..... 0 MORE THAN A YEAR AGO//*ZAIDI YA MWAKA MMOJA ULIOPITA* ..... 1 DON'T REMEMBER// *SIKUMBUKI* ..... 98 NO ANSWER// *HAKUNA JIBU* 99	☐☐
402	Which clinic/health facility do you get your ARVs?// *Je, wewe hupata madawa ya ARVs kutoka kliniki/ kituo cha afya kipi?*	RECORD FACILITY NAME// *NAKILI JINA LA KITUO CHA AFYA* _____	
403	How do would you describe your health since you started treatment?// *Je, unaweza kueleza hali yako ya afya imekuwaje tangu uanze matibabu?*	BETTER// *BORA*……. 1 SAME// *VILE VILE*……. 2 WORSE// *MBAYA ZAIDI*……. 3	
404	**Participant perception on Quality of care in the ARV clinic// *Maoni ya mshiriki kuhusu ubora wa matibabu katika kliniki ya ARV***		
	A. Are you given the chance to state your problems and ask questions?// *Je, unapewa nafasi ya kutaja shida zako na kuuliza maswali?*	NO// *LA* ..... 0 YES// *NDIO* 1	

	B. Do you feel listened to?// *Je, unahisi huwa unasikizwa?*	NO// *LA* ..... 0 YES// *NDIO* 1	
	C. Are you treated with respect? // *Je, unetunzwa kwa heshima?*	NO// *LA* ..... 0 YES// *NDIO* 1	
	D. Do you feel you can trust the health workers? // *Je, unahisi kuwa unaweza waamini wahudumu wa afya?*	NO// *LA* ..... 0 YES// *NDIO* 1	
	E. Do you have privacy during consultation and counselling?// *Je, wewe huwa na usiri wakati unaenda kupata huduma au ushauri?*	NO// *LA* ..... 0 YES// *NDIO* 1	
	F. How long do you spend on average at the clinic when you go to collect your ARVs?// *Je, wewe hutumia muda gani kwa wastani katika kliniki wakati unapoenda kuchukua madawa ya ARVs?*	Average Min/Hours….// *Wastani wa dakika/saa.....*	
405	When you were given ARVs for the first time did the health worker provide you with information on the following?// *Wakati ulipatiwa madawa ya ARVs kwa mara ya kwanza, je, mhudumu wa afya alikupa habari kuhusu yafuatayo?*		
	A. How ARVs work?// *Jinsi ARVs hufanya kazi*	NO// *LA* ..... 0 YES// *NDIO* 1	
	B. How to use them?// *Jinsi ya kuzitumia*	NO// *LA* ..... 0 YES// *NDIO* 1	

	C. The need to continue treatment// *Umuhimu wa kuendelea na matibabu*	NO// *LA* ..... 0 YES// *NDIO* 1	
	D. What to do if a pill is forgotten?// *Jambo la kufanya wakati tembe imesahaulika*	NO// *LA* ..... 0 YES// *NDIO* 1	
	E. What to do if side effects occur with the drugs you will be taking? //*Jambo la kufanya wakati adhari ya dawa utakazokuwa ukinywa itatokea*	NO// *LA* ..... 0 YES// *NDIO* 1	
	F. When and where to get re-supply? // *Lini na mahali pa kupata nyongeza*	NO// *LA* ..... 0 YES// *NDIO* 1	
	G. What is required when you come for re- supply (bring unused medicines?)// *Nini kinachohitajika wakati unaenda kupokea nyongeza (kuleta madawa ambayo hayajatumika)*	NO// *LA* ..... 0 YES// *NDIO* 1	
	H. Possible interactions with other drugs (including traditional medicine)//*Uwezekano wa uhusiano na madawa mengine (yakiwemo madawa ya kienyeji)*	NO// *LA* ..... 0 YES// *NDIO* 1	
406	**Cost related to access of ARVS// *Gharama ya upatikanaji wa ARVs***		
	A. Do you lose any income as a result of your coming to the clinic? // *Je, wewe hupoteza mapato yoyote kwa sababu ya kuja kwenye kliniki?*	NO// *LA* ..... 0 YES// *NDIO* 1	

	B. How much do you have to pay to cover your travel expenses when you visit the clinic?// *Je, wewe hulipa pesa ngapi unaposafiri kwenda kwenye kliniki*	Kshs: …….	
	C. Do you incur any other costs as a result of your taking ART? // *Je, wewe hutumia pesa zingine zozote kwa sababu ya kutumia ART*	NO// *LA* .....0 YES// *NDIO* .....1 If yes please specify// *Kama Ndio fafanua*_____	
	D. Do you receive financial support from your family?// *Je wewe huungwa mkono kifedha na familia yako?*	NO// *LA* .....0 YES// *NDIO* 1	

NO.	**QUESTIONS// *MASWALI***	**CODING CATEGORIES// *VIKUNDI VYA ALAMA FICHE***	**SKIP// *KURUKA***
407	Adherence and non-adherence to ART// *Kuzingatia na kutozingatia ART*		
	A. Have you ever missed any appointment at the clinic where you get your ARVs?// *Je, umeshakosa miadi kwenye kliniki uendapo kupokea madawa ya ARVs*	NO// *LA* .....0 YES// *NDIO* .....1 If yes….// *Kama ndio....*	
	B. Have you ever skipped taking your ARVS?// *Je, umeshawahi kosa kunywa madawa yako ya ARVs?*	NO// *LA* .....0 YES// *NDIO* 1	

	C. In the past 30 days, have you missed taking any of your ARV pills?// *Kwa siku 30 zilizopita, umeshawahi kosa kunywa tembe zozote zako za ARVs*	YES// *NDIO*……..1 NO// *LA*……2 DON'T KNOW// *SIJUI*……8 REFUSED// *AMEKATAA*……98	
	D. Have you ever had a CD4 count test to see if your immune system is working properly?// *Je, umewahi fanyiwa uchunguzi wa hesabu ya CD4 ili kuangalia kama mfumo wako wa afya unafanya kazi vizuri?*	YES// *NDIO*……..1 NO// *LA*……2 DON'T KNOW// *SIJUI*……8	
408	Have any of the following ever made you to skip your medication// *Je, yafuatayo yamewahi kufanya usinywe madawa yako*		
	A. ..... Felt better// *Nilijihisi nafuu*	NO// *LA* .....0 YES// *NDIO* 1	
	B. ..... Experienced side effects// *Nilipata tukio la athari*	NO// *LA* .....0 YES// *NDIO* 1	
	C. ..... TOO BUSY/NO TIME// *SHUGHULI NYINGI/ SINA WAKATI*	NO// *LA* .....0 YES// *NDIO* 1	
	D. ..... Pill Burden// *Mzigo wa tembe*	NO// *LA* .....0 YES// *NDIO* 1	

	E.…… Clinic not accessible// *Kliniki haipatikani/ iko mbali*	NO// *LA* .....0 YES// *NDIO* 1	
	F.…… Lack of care or support// *Ukosefu wa huduma na kuungwa mkono*	NO// *LA* .....0 YES// *NDIO* 1	
	G. …… Lack of money to meet travel cost// *Ukosefu wa pesa za kugharamia usafiri*	NO// *LA* .....0 YES// *NDIO* 1	
	H. …… Hospitalised// *kulazwa hospitalini*	NO// *LA* .....0 YES// *NDIO* 1	
	I.…… Shared pills// *Kugawana tembe*	NO// *LA* .....0 YES// *NDIO* 1	
	J. …… Alcohol and drug use// *Unywaji pombe au madawa ya kulevya*	NO// *LA* .....0 YES// *NDIO* 1	
	K. …… Didn't have the pills with you// *Huna tembe pamoja nawe*	NO// *LA* .....0 YES// *NDIO* 1	
	L.…… Lack of food// *Ukosefu wa chakula*	NO// *LA* .....0 YES// *NDIO* 1	
	M.…… Depressed// *Manung'uniko*	NO// *LA* .....0 YES// *NDIO* 1	

	N. ..... Distance// *Umbali*	NO// *LA* .....0 YES// *NDIO* 1	
	O. ..... Simply forgot// *Nilisahau*	NO// *LA* .....0 YES// *NDIO* 1	
	P..... Feeling that you had to hide your medication from those around// *Kuhisi kuwa ilikulazimu ufiche madawa yako kutoka kwa walio karibu*	NO// *LA* .....0 YES// *NDIO* 1	
	Q. ..... Others (describe)// *Mengine (fafanua)*	NO// *LA* .....0 YES// *NDIO* .....1 Describe// *Eleza* …….	
409	Do you have anyone to remind you to take your medication?// *Je, una yeyote anayekukumbusha kunywa dawa?*	NO// *LA* .....0 YES// *NDIO* 1	
410	Do you use reminders such as phone alert, diary or calendar for your ARVS?// *Je, huwa unatumia vikumbusho kama kwenye simu ya rununu, shajara au kalenda?*	NO// *LA* .....0 YES// *NDIO* .....1 Specify// *Fafanua* ……	

SECTION V:VIOLENCE AND ALCOHOL USE// *SEHEMU V: UKATILI NA UNYWAJI POMBE*

NO.	QUESTIONS// *MASWALI*	CODING CATEGORIES// *VIKUNDI VYA ALAMA FICHE*	SKIP// *KURUKA*
501	During the past 1 month, have you consumed drinks containing alcohol or any other drug of addiction?// *Je, kwa mwezi 1 uliopita, umekunywa vinywaji vyovyote vyenye vileo au madawa yoyote yenye uzoefu?* **READ THE RESPONSES AND MARK ONE ONLY// *SOMA MAJIBU NA UCHAGUE MOJA PEKEE***	NEVER// *SIJAWAHI*.....0 → EVERY DAY// *KILA SIKU*.....1 AT LEAST ONCE A WEEK// *MARA MOJA KWA WIKI* .....2 LESS THAN ONCE A WEEK// *CHINI YA MARA MOJA KWA WIKI*.....3 NOT IN THE PAST ONE MONTH// *SI KWA MWEZI MMOJA ULIOPITA* .....4 DON'T KNOW// *SIJUI* .....98 NO ANSWER// *HAKUNA JIBU*……..99	**503**
502	During the past month, how frequently did you take alcohol?// *Kwa mwezi uliopita, umetumia pombe kama mara ngapi?* Would you say: **(Read all responses and mark only ONE)**// *Ungesema: (**Soma majibu na uchague moja pekee**)*	EVERYDAY // *KILA SIKU*.....1 ATLEAST ONCE A WEEK// *MARA MOJA KWA WIKI* .....2 LESS THAN ONCE A WEEK// *CHINI YA MARA MOJA KWA WIKI*.....3 NOT IN PAST ONE MONTH// *SI KWA MWEZI MMOJA ULIOPITA*.....4 NO ANSWER// *HAKUNA JIBU*……99	
503	In the past 6 months, has anyone beaten (hurt, hit, slapped, pushed, kicked, punched, choked or burned, but not use of weapon) you because of your sexual identity/orientation?//	NO// *LA*.....0 YES// *NDIO*.....1 NO ANSWER// *HAKUNA JIBU* 99	
504	In the past 3 months, were you ever physically forced to have sexual intercourse with someone even though you didn't want to?// *Je, kwa miezi*	NO// *LA*.....0 YES// *NDIO*.....1 NOT APPLICABLE// *HAITUMIKI HAPA* .. 97	

	mitatu iliyopita, umewahi kulazimishwa kwa nguvu kufanya ngono na mtu fulani hata ingawa hukutaka?	NO ANSWER// *HAKUNA JIBU* 99	
505	Who did this to you?/*Nani alikutendea haya?* **MULTIPLE ANSWERS POSSIBLE // *MAJIBU MENGI YAWEZEKANA***	STRANGER// *MGENI*..... A BROKER// *ANAYELETA KAZI*..... B OTHER SEX WORKER// *KAHABA MWINGINE* .C LIVE-IN PARTNER/HUSBAND// *MWENZI NIISHIE NAYE/ MME*..... D TEMPORARY HUSBAND/ BOY FRIEND/ PARTNER// *MME WA MUDA/ MPENZI WA KIUME* .....E FAMILY MEMBERS// *JAMAA WA FAMILIA* F GOVT OFFICIALS// *WAHUDUMU WA SERIKALI*G HEALTH CARE PROVIDER// *WAHUDUMU WA AFYA* ..... H POLICE // *POLISI* .....I CLIENTS// *WATEJA* ..... J OTHER(SPECIFY)// *NYINGINE (FAFANUA)*_____ ..... K DON'T KNOW// *SIJUI* ..... Y NO ANSWER // *HAKUNA JIBU* .....Z	
506	**CHECK 503 AND 504: IF CODED '1' EITHER IN 503 OR 504, ASK 507, ELSE SKIP TO 509// *ANGALIA 503 NA 504, KAMA IMEWEKWA ALAMA FICHE "1" KWA 503 AU 504, ULIZA 507, KAMA SIVYO, RUKA MPAKA 509***		

507	When you experienced violence last time, where did the incident(s) occur? // *Wakati ulitendewa ukatili mara ya mwisho, (ma) tukio hili lilitendeka wapi?*	HOME// *NYUMBANI* ..... 1 PUBLIC PLACE// *MAHALI PA UMMA* ..... 2 BROTHEL// *MAHALI PA KUFANYIA UKAHABA* 3 POLICE STATION// *KITUO CHA POLISI* ... 4 WORK PLACE// *MAHALI PA KAZI*..... 5 HEALTH FACILITY// *KITUO CHA AFYA*... 6 SELF HELP GROUP//*MAHALI PA KIKUNDI CHA KUJITEGEMEA* ..... 7 OTHER(SPECIFY)// *NYINGINE (FAFANUA)*96	
508	When you experienced violence last time, did you report this incident to the police? // *Wakati ulitendewa ukatili mara ya mwisho, ilipiga ripoti kwenye kituo cha polisi?*	NO// *LA* .....0 YES// *NDIO* .....1 NO ANSWER// *HAKUNA JIBU*..... 99	
509	Have you ever been arrested because of your sexual identity/orientation?// *Je, umewahi kushikwa kwa sababu ya utambulishi wako wa kimapenzi?* **(By 'arrested' we mean the police took you to the police station)// *(Kwa kushikwa, tunamaanisha afisa wa polisi walikupeleka kwenye kituo cha polisi)***	NO// *LA* .....0 YES// *NDIO* .....1 NO ANSWER// *HAKUNA JIBU*..... 99	

SECTION VI:HIV-RELATEDSOCIAL STIGMA// *SEHEMU VI: KUTENGWA KWA KIJAMII KUKAKOHUSIANA NA HIV*

I would now like to ask you about your experiences accessing and utilizing health services.// *Sasa ningependa kukuuliza kuhusu uzoefu wako wa kupokea na kutumia huduma za afya*

NO.	QUESTIONS// *MASWALI*	CODING CATEGORIES// *VIKUNDI VYA ALAMA FICHE*	SKIP// *KURUKA*
601	Has a health worker ever treated you poorly/badily because of your sexuality/sexual orientation/sexual identity?// *Je, mhudumu wa afya amewahi kukupokea vibaya kwa ajili ya utamulishi wako wa kimapenzi?*	NO// *LA*..... 0 YES// *NDIO*..... 1	**603**
602	In the past 6-12 months, how much of the OCCASSIONS would you say a health worker treated you poorly/badly when you sought health services because of your sexuality/sexual orientation/sexual identity?// *Kati ya miezi 6-12 iliyopita, ni matukio mangapi ungesema mhudumu wa afya alikupokea vibaya kwa ajili ya utamulishi wako wa kimapenzi?* Would you say: **(Please read out all answers and mark ONLY ONE)**// *Ungesema: (**Soma kwa sauti majibu yote na uchague moja pekee)***	ALL OF THE OCCASSIONS // *MATUKIO YOTE* 1 MOST OF THE OCCASSIONS // *MATUKIO KARIBU YOTE*.....2 SOME OF THE OCCASSIONS // *BAADHI YA MATUKIO*.....3 A LITTLE OF THE OCCASSIONS // *MATUKIO KIDOGO*.....4 NONE OF THE OCCASSIONS// *HAKUNA TUKIO HATA MOJA*.....5	
603	How comfortable are you while feel discussing your HIV treatment with a health worker? // *Je, una uwazi/uhuru upi wakati unajadili matibabu yako ya HIV na mhudumu wa afya?*	VERY COMFORTABLE //*NINA UHURU KABISA* 1 SOMEWHAT COMFORTABLE// *NINA UHURU KIASI* .....2 NOT SURE// *SINA UHAKIKA*.....3 A LITTLE COMFORTABLE // *NINA UHURU KIDOGO*	

	Would you say: **(Please read out all answers and mark ONLY ONE)**// *Ungesema: (**Soma kwa sauti majibu yote na uchague moja pekee)***	.....4 NOT COMFORTABLE AT ALL// *SINA UHURU HATA KIDOGO*.....5	
604	If you thought a health worker whom you have never seen before would find out that you are a male sex worker living with HIV are you likely to seek treatment for HIV or other health problems from the health worker? // *Je, kama ungefikiria kuwa mhudumu wa afya ambaye hujawahi kumuona tena angejua kuwa wewe ni kahaba wa kiume anayeishi na virusi vya HIV, unaweza kutafuta huduma za afya za HIV au shida zingine za kiafya kutoka kwa mhudumu huyu?* Would you say: **(Please read out all answers and mark ONLY ONE)**// *Ungesema: (**Soma kwa sauti majibu yote na uchague moja pekee)***	VERY LIKELY // *KUNA UWEZEKANO SANA* 1 SOMEWHAT LIKELY// *KUNA UWEZEKANO KIASI* .....2 NOT SURE// *SINA UHAKIKA*.....3 LESS LIKELY // *HAKUNA UWEZEKANO SANA* 4 UNLIKELY/ NOT AT ALL// *HAKUNA UWEZEKANO KAMWE* 5	
605	If you thought other people would find out that you are taking antiretroviral medicines (ARVs) is it likely to affect you?// *Je, kama ungefikiria kuwa watu watagundua kuwa wewe hunywa madawa ya ARVs, kuna uwezekano jambo hili litakudhuru?* Would you say: **(Please read out all answers and mark ONLY ONE)**// *Ungesema: (**Soma kwa sauti majibu yote na uchague moja pekee)***	VERY LIKELY // *KUNA UWEZEKANO SANA* 1 SOMEWHAT LIKELY// *KUNA UWEZEKANO KIASI* .....2 NOT SURE// *SINA UHAKIKA*.....3 LESS LIKELY // *HAKUNA UWEZEKANO SANA* 4 UNLIKELY/ NOT AT ALL// *HAKUNA UWEZEKANO KAMWE* 5	

606	If you thought other people would find out that you are taking antiretroviral medicines (ARVs) how likely is it that you would use ARVs // *Je, kama ungefikiria kuwa watu watagundua kuwa wewe hunywa madawa ya ARVs, kuna uwezekano upi kuwa utatumia ARVs?* Would you say: **(Please read out all answers and mark ONLY ONE)**// *Ungesema: (**Soma kwa sauti majibu yote na uchague moja pekee)***	VERY LIKELY // *KUNA UWEZEKANO SANA* 1 SOMEWHAT LIKELY// *KUNA UWEZEKANO KIASI* .....2 NOT SURE// *SINA UHAKIKA*.....3 LESS LIKELY // *HAKUNA UWEZEKANO SANA* 4 UNLIKELY/ NOT AT ALL// *HAKUNA UWEZEKANO KAMWE* 5	

SECTION VII: SOCIAL CONNECTEDNESS// *MUUNGANO WA KIJAMII*

NO.	QUESTIONS// *MASWALI*	CODING CATEGORIES// *VIKUNDI VYA ALAMA FICHE*	SKIP// *KURUKA*

701	From time to time, most people discuss important matters with other people. Looking back over the past 3-6 months, who are the people with whom you discussed matters important such as your HIV positive status? // *Mara kwa mara, watu hujadiliana mambo muhimu na watu wengine. Ukiangalia nyuma kwa miezi 3-6 iliyopita, ni watu wapi ambao umeweza kujadiliana nao mambo muhimu kama hali yako ya HIV?*	**Relationship to close friends// *Uhusiano wa marafiki wa karibu***
		CODES// *ALAMA FICHE*
		LIVE-IN PARTNER/. *MWENZI NINAYE ISHI NAYE* 01
		PARENT// *MZAZI* 02
		CHILD// *MTOTO*..... 03
		SIBLING (SISTER/BROTHER)// *NDUGU (DADA/KAKA)* 04
		OTHER FAMILY MEMBER (RELATIVE)// *JAMAA MWIGINE WA FAMILIA (NDUGU)* 05
		CO-WORKER (WORKMATE)// *MWENZI (MFANYIKAZI-MWENZA)* 06
		MEMBER OF A GROUP (E.G. CHURCH, CLUB) ..
		//*MMOJA WA KIKUNDI (K.M KANISANI, KLABU*....07
		NEIGHBOUR// *JIRANI* 08
		NON-FAMILY FRIEND// *RAFIKI ASIYE WA FAMILIA* 09
		PROFESSIONAL ADVISER E.G. COUNSELLOR .
		// *MSHAURI MTALAAM*.....10
		TALK TO NO ONE ON PERSONAL MATTERS .
		// *SIONGEI NA YEYOYE KUHUSU MASWALA BINAFSI*.....11
		OTHER (SPECIFY)// *NYINGINE (FAFANUA)*12	

702	Over the last 1-3 months, how often do you have		

	face-to-face contact with your closest <u>family (blood relative)</u> member?// *Kati ya miezi 1-3 iliyopita, je, umekuwa na mawasiliano ya ana kwa ana na ndugu wako wa karibu katika jamii yako (uhusiano wa damu) mara kama ngapi?* ***Would you say:*** ***(INTERVIEWER: Read out the response options and circle only ONE answer) // Ungesema (Anaye hoji: Soma majibu yaliyomo na uzunguzie duara kwa jibu MOJA pekee)***	AT LEAST ONCE A MONTH// *MARA MOJA KWA MWEZI* ..... 01 AT LEAST ONCE A WEEK// *MARA MOJA KWA WIKI* ..... 02 AT LEAST SEVERAL TIMES A WEEK// *MARA KADHAA KWA WIKI* ..... 03 DAILY// *KILA SIKU* ..... 04 LIVING TOGETHER// *TUNAISHI PAMOJA*05 NO SUCH RELATIVE OR FRIEND// *SINA NDUGU AU RAFIKI KAMA HUYO* ..... 06 NO CONTACT// *SINA UHUSIANO* 07	
703	Over the last 1-3 months, how often do you have face-to-face contact with your closest <u>non-family (non-blood relative)</u> friend? // *Kati ya miezi 1-3 iliyopita, je, umekuwa na mawasiliano ya ana kwa ana na ndugu wako wa karibu asiye wa jamii yako (uhusiano usio wa damu) mara kama ngapi?* ***Would you say:*** ***(INTERVIEWER: Read out the response options and circle only ONE answer) // Ungesema (Anaye hoji: Soma majibu yaliyomo na uzunguzie duara kwa jibu MOJA pekee)***	AT LEAST ONCE A MONTH// *MARA MOJA KWA MWEZI* ..... 01 AT LEAST ONCE A WEEK// *MARA MOJA KWA WIKI* ..... 02 AT LEAST SEVERAL TIMES A WEEK// *MARA KADHAA KWA WIKI* ..... 03 DAILY// *KILA SIKU* ..... 04 LIVING TOGETHER// *TUNAISHI PAMOJA*05 NO SUCH RELATIVE OR FRIEND// *SINA NDUGU AU RAFIKI KAMA HUYO* ..... 06 NO CONTACT// *SINA UHUSIANO* 07	
704	Who would you turn to in <u>the FIRST instance</u> if you needed help in the following different situations? // *Je, unaweza mgeukia nani kwa MARA YA KWANZA kama unahitaji usaidizi / kuungwa mkono kwa*	**Potential sources of support // *Kiini cha usaidizi*** ***INTERVIEWER: Do NOT read out// ANAYE HOJI: USISOME***	

	mambo tofauti yafuatayo	CODES// *ALAMA FICHE*
		BLOOD RELATIVE// *NDUGU WA UHUSIANO WA DAMU* 01
		OTHER RELATIVES (E.G. IN-LAWS)// *JAMAA/NDUGU WENGINE (KAMA WAKWE*02
		A NON-RELATIVE CLOSE FRIEND// *NDUGU ASIYE WA JAMII AU RAFIKI WA KARIBU*..... 03
		NEIGHBOUR// *JIRANI* 04
		WORK COLLEAGUE// *MFANYI KAZI MWENZA* 05
		SOMEONE ELSE// *MTU MWIGINE*..... 06
		MEMBER OF A GROUP YOU BELONG TO// //*MMOJA WA KIKUNDI AMPABO WEWE NI MSHIRIKA* 07
		NO ONE// *HAKUNA YEYOTE* 08
		OTHER(SPECIFY)// *NYINGINE (FAFANUA)*09	

	TYPES OF SITUATIONS REQUIRING SUPPORT// *HALI ZINAZOHITAJI KUUNGWA MKONO/ USAIDIZI*	FIRST INSTANCE SOURCE OF SUPPORT// *KIINI CHA USAIDIZI/KUUNGWA MKONO KWA MARA YA KWANZA*	
	a) To borrow money// *Kuomba msaada wa kifedha*	☐☐	
	b) To have someone to talk to if you were feeling down and depressed// *Kuwa na mtu wa kuzungumza naye wakati unajisikia mnyonge au mwenye manung'uniko*	☐☐	
	c) To have someone take you to hospital if you were ill//*Kuwa na mtu wa kukupeleka hospitalini wakati una ugua*	☐☐	
	d) To support you in treatment adherence// *Kukusaidia kuzingatia matibabu*	☐☐	

705	Do you belong to any group (registered or unregistered) whose members are exclusively or mostly of MSM/MSWs? // *Je, wewe ni mwanachama wa kikundi (kilicho sajiliwa au kisicho sajiliwa) ambapo wanachama wengi ni MSM/MSWs?*	NO// *LA* .....0 YES// *NDIO* 1	
706	If yes, For how long have you been involved with the group? // *Je, umekuwa mwanachama wa kikundi hiki kwa muda gani?*	LESS THAN 6 MONTHS//*CHINI YA MIEZI 6*1 7-12 MONTHS// *KATI YA MIEZI 7-12* ..... 2 1-2 YEARS// *KATI YA MIAKA 1-2* ..... 3 3 OR MORE YEARS //*MIAKA 3 AU ZAIDI*.. 4	
707	In the past 3 months, how frequently have you been involved with the MSM social groups or its activities? // *Katika miezi 3 iliyopita, ni kwa muda gani umekuwa ukijishughulisha na vikundi vya kijamii vya MSM au shughuli zao?* Would you say: **(Please read out all answers and mark ONLY ONE)//** *Ungesema: (**Soma kwa sauti majibu yote na uchague moja pekee)***	VERY FREQUENTLY // *MARA NYINGI SANA* 1 SOMEWHAT FREQUENTLY // *MARA NYINGI KIASI* ..... 2 NOT SURE// *SINA UHAKIKA* ..... 3 A LITTLE FREQUENTLY // *SI MARA NYINGI* 4 NOT AT ALL//*HATA KAMWE* 5	
NOTES// *JUMBE* THANK YOU // *ASANTE*			

Appendix 5: Focus Group Discussion Guide for Male Sex Workers Living with HIV on Art

// Nyongeza C: KIONGOZO CHA MAJADILIANO YA KIKUNDI CHA WAUME WAFANYAO KAZI YA UKAHABA WANAOISHI NA HIV WALIO KWENYE ART

Short introductory remarks// *Matamko mafupi ya kutambulisha*

- Introduction of researchers and participants // *Kutambulisha watafiti na wanaoshiriki*
- Thank participants for agreeing to participate, all share a common feature – they are on ARV treatment, are here to share their thoughts about ARVs and difficulties in taking ARVs: we want to learn from participants // *Shukuru washiriki kwa kukubali kushiriki, wote wana tabia sawa- wote wamo kwenye matibabu ya ARV, wako hapa kupeana maoni yao kuhusu ARVs na changamoto za kuzitumia madawa haya: tunataka kujifunza kutoka kwa washiriki hawa*
- Explain purpose of study, purpose of this discussion, reassurance about confidentiality, agree on rules.// *Eleza madhumuni ya utafiti, madhumuni ya majadialiano, hakikishia kuhusu usiri, kubaliana kuhusu kanuni*

Topics for discussion (translation)// *Maada za majadialiano*

1. What is your experience of ART and perceived benefit (s) of treatment? (probe about adherence, adverse effects, pill burden, lack of food, lifestyle issues).// *Je, uzoefu wako na ART ni upi na manufaa ya matibabu? (chunguza kuhusu uzingatizi, athari hatari, mzigo wa tembe, ukosefu wa chakula, hali ya maisha)*
2. In your view, how relevant and accessible are local HIV/AIDS treatment to male sex workers?// *kwa maoni yako, matibabu yaliyoko ya HIV/AIDS yana patikana vipi na yana umuhimu gani kwa waume wanaofanya kazi ya ukahaba?*
    a. How do you think you are being treated (handled) by the health care workers (probe: privacy, confidentiality, respect, being listened to,

time spent with patient, waiting time, integration with other services). What is the quality of care provided by health care workers?// *Je, unafikiria kuwa unapokelewa vipi na wahudumu wa afya? (Chunguza; ubinafsi, usiri, heshima, kusikizwa, muda unaotumika na mgonjwa, wakati wa kungoja, kujumulishwa na huduma zingine)*

3. What do you think about the counselling that you receive? (probe especially on importance of adherence effectiveness of counselling). What support are you given by the health workers to help you adhere better to your medications? Have you disclosed? //*Je, maoni yako ni yapi kuhusu ushauri unao pokea? (Chunguza sana sana kuhusu umuhimu wa kuzingatia ushauri). Je, unapata usaidizi upi kutoka kwa wahudumu wa afya ili kukusaidia kuzingatia matibabu? Je, umemwambia mtu yeyote kuhusu hali yako?*
4. What support is available for you in the community, in the family, in the workplace? (probe about discrimination, stigma). Probe differences in perceived availability of social support versus social networks? Any negative social support? Any stress exacerbation? // *Je, ni usaidizi upi unaopatikana kwako katika jamii, familia, kazini? (chunguza kuhusu kutengwa). Chunguza tofauti zinazofikiriwa kuweko kwenye upatikanaji wa usaidizi kutoka kwa jamii na mitandao ya kijamii. Kuna usaidizi usio mwema?*
5. In your opinion do male sex workers have different experiences in access and utilisation of HIV treatment services from other people living in HIV in Kenya? What are some of the differences? // *Kwa maoni yako, waume wanaofanya kazi ya ukahaba wana uzoefu tofauti katika kupata na kutumia huduma na matibabu ya HIV wakilinganishwa na watu wengine wanaoishi na HIV nchini Kenya?Tofauti ni kama zipi?*
6. What do you think could be done to help male sex workers adhere more easily to their treatment? // *Je, unaoenelea ni jambo gani linaweza kufanywa ili kusaidia waume wanaofanya kazi ya ukahaba kuzingatia matibabu?*
7. What do you think are the key reasons for non-adherence and good adherence? What are the sources of motivation for adherence?// *Je, unafikiria ni ni sababu zipi kuu zinazochangia kutozingatia matibabu na kuzingatia matibabu? Vianzo vya motisha ni vipi ili kuchangia kuzingatia?*

8. What are your recommendations for improving treatment adherence for HIV positive sex workers? *Mapendekezo yako ni yapi ili kuboresha uzingatiaji wa matibabu ya HIV kwa makahaba wanaoishi na virusi vya HIV?*

Duration of discussion (1½ hours); provide refreshments // *Muda wa majadiliano (saa moja na nusu)*

Conclusion, thank participants// *kumalizia, shukuru washirika*

Appendix 6: Key Informant Interviews//Majadiliano Na Wanshiriki Maalum

Medical doctor, Nurse, Pharmacist, Social worker/Counsellor, Receptionist, laboratory personnel and programme managers//*Daktari/ Nesi/Muuzaji madawa/ Mfanyikazi wa Kijamii/ Mshauri/Mpokezi/wafanyikazi wa maabara na meneja wa programu*

Name of facility:// *Jina la kituo*

Name interviewer:// *Jina la anaye hoji* _____

Interview number:// *Nambari ya anaye hoji* _____

Date:// *Tarehe* _____

(Introduction of the interviewer (s), introduction of the study)// Kitambulishi cha anaye(wanao) hoji, kitambulishi cha utafiti _____

Drugs, Treatment and Procedures// *Madawa, Matibabu na Taratibu*

a) Which treatment guidelines for HIV/AIDS management do you use at this facility? (Give details if necessary, e.g. national guidelines etc) // *Je, ni miongozo ipi ya matibabu ya HIV/AIDS unayo tumia katika kituo hiki?*
b) Are the drugs you prescribe always available? (If not, give details – how often, reason, what do you do about it) // *Je, madawa unayopendekeza hupatikana kila wakati? (Kama la, peana maelezo- mara ngapi, kwanini)*
c) Have you had periods where your patients have not been able to get their medications because they were not available in stock? // *Je, kuna matukio wateja wako hawajaweza kupata madawa kwa sababu yalikuwa yameisha kwenye akiba?*

a) What strategies have you in place to ensure patients receiving ARVs adhere well enough to their treatment? // *Ni mikakati upi uliyo nayo ili kuhakikisha kuwa wagonjwa wanaopata madawa ya ARV wanazingatia matibabu vyema?*

Generally speaking, do your patients keep their appointments?// *Kwa ujumla, wateja wako huweka miadi?*

a) What do think the adherence levels of your male sex workers in terms of taking ARVs is?// *Je, unafikiria uzingatiaji wa kunywa madawa wa ARVs na wateja ambao ni waume wafanyao kazi ya ukahaba ni wa kiwango kipi?*
b) Could you estimate the percentage of male sex workers who you think are "sufficiently adherent" to ART? (Respondent gives their definition of 'sufficiently adherent' what level is that?) ** // *Je, unaweza kukadiria ni asilimia ngapi ya waume wanaofanya kazi ya ukahaba ambao wanazingatia matibabu kwa njia ya kutosha?*
c) What do you use to determine adherence (probe: appointments, refills?) // *Je, unatumia nini kuhakikisha uzingatizi (chunguza: miadi, nyongeza)*
d) We would like to get your views on the following (probe): From your experience //*Tungependa kupata maoni yako kwa yafuatayo (chunguza) kutoka kwa uzoefu wako*
    - How would you compare adherence between male sex workers and other men in the general population? // *Unaweza kulinganisha uzingatiaji wa waume wafanyao kazi ya ukahaba na waume wengine kwa jumla kivipi?*
    - How would you compare adherence between older male sex workers patients and younger ones? //*unaweza kulinganisha vipi waume wafanyao kazi ya ukahaba walio na umri mkubwa na vijana*
    - How does a patient's educational level affect adherence? // *Je, kiwango cha elimu cha mgonjwa kinaadhiri vipi uzingatiaji*
    - How do you think that cost to patients influences adherence? // *Je, unafikiria gharama inaadhiri uzingatiaji ki vipi?*
    - How do you think the distance to the health facility affects adherence? //*Je, unafikiria umbali wa vituo vya afya unaadhiri uzingatiaji?*
e) From your experience how do you think the following affect adherence? // *Kutokana na uzoefu wako, unafikiria yafuatayo huadhiri uzingatiaji vipi?*

- Having or not having a treatment-support partner? // *kuwa au kutokuwa na mwenzi wa kusaidia katika matibabu*
- Duration of treatment? *// muda wa matibabu*
- Side effects? // *Adhari za kando*
- Lack of food? // *ukosefu wa chakula*
- Knowledge about ART? // *maarifa ya ART*

f) What are the main challenges you face in supporting your patients to adhere to ARV drugs (especially for longer term users)? // *Changamoto kuu unazokumbana nazo unaposaidia wagonjwa wako kuzingatia matibabu ya ART (sana sana kwa wenye kutumia madawa kwa muda mrefu) ni zipi?*

Is there anything else you would like to tell us or ask us?// Kuna jambo lingine ungependa kutueleza au kutuuliza?

Thank you very much for your participation in this interview.// *Asante sana kwa kushiriki kwako 'kwenye mahojiani haya*

Appendix 7: Research Participants Referral Letter forevaluation and/or Treatment

Date

Address

RE: (Patient's name)

Dear _____

I am referring _____(Patient Name) to your clinic.

Factors to consider: _____
_____
_____

Should you require any clarifications I can be reached at
_____

Sincerely,

Signature

cc: Patient