Research Article

Correlates of ART Adherence among Male Sex Workers (MSW) in Kenya

Ruth Laibon[1*], Michael Kiptoo[2,3], Kenneth Ngure[4], Vincent O Oeba[5], Charles Sabo[6], Camille Wood[6], John Mathenge[7] and Peter Memiah[6]

[1]*Jomo Kenyatta University of Agriculture and Technology, Institute of Tropical Medicine and Infectious Diseases, Kenya*

[2]*Kenya Medical Research Institute, Kenya*

[3]*South Eastern Kenya University, Kenya*

[4]*Jomo Kenyatta University of Agriculture and Technology; Department of Public Health, Kenya*

[5]*Independent Research Scientist, Kenya*

[6]*University of West Florida; Department of Public Health, Kenya*

[7]*Health Options for Young men with AIDS / STI (HOYMAS), Kenya*

Abstract

Given the relevance of antiretroviral therapy (ART) treatment to improving life expectancy and preventing the spread of drug-resistant strains, many studies have attempted to predict causes of adherence and non-adherence in order to design strategies that reduce the number of missed doses. Methodologically, there is growing agreement that patients' self-assessments of adherence—through interviews or self-administered questionnaires—show significant correlation with viral load tests. Little is known about the level of ART adherence among male sex workers (MSW) in Kenya; particularly in Nairobi. This study was aimed to determine the level of adherence to antiretroviral therapy and associated factors among MSW.

Methods

A cross-sectional study was conducted in Nairobi County, Kenya targeting male sex workers living with HIV and on antiretroviral therapy in Nairobi Kenya. A total of 260 MSWs were recruited through a combination of chain referrals and venue-based sampling. Data was analyzed 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. The results were presented using appropriate frequency and percentage numbers. Odds ratios were used to present both binary and multivariate models.

Results

Based on a composite criterion to establish self-reported non-adherence, 60% (158) were found non-adherent with 40% (104) adherent. Socio-demographic variables (Age; Education level; Religious denomination; Marital status) were not associated with self-reported adherence. However the subject's main reason for getting into sex work (p=0.0017) and knowledge status (p=0.045) were associated with self-reported adherence. Multivariate logistic analysis showed some of the factors such as younger MSW (19-24) (aOR: 2.1: CI: 0.5-9.5); post-secondary education (aOR: 3.9: CI: 0.8-19.5); belonging to the Muslim religion (aOR: 2.1: CI: 0.4-12; living in Nairobi for more than 5 years (aOR: 1.3: CI: 0.4-3.7); reporting sex work as a main source of income (aOR: 8.9: CI:2.8-

38.2); Having an average income of less than Ksh 1000 (aOR: 3.7: 0.2-65.9); having a single sexual partner (aOR:2 CI: 0.5-12.2); never been arrested because of sexual identity (aOR: 1.7: CI: 0.9-2.8); being knowledgeable about HIV and ART (aOR: 2.1CI: 1.4-3.8) were more likely to be adherent.

Conclusion

The adherence rates found in the MSW are lower than those of men in the general population. Adherence is a complex issue which requires multiple approaches to address fully. Efforts to improve the level of adherence for this group require a collaborative approach involving the patient, the MSW community, health workers, and policy makers to address the structural constraints of adherence.

Key Words: ART; Adherence; MSW

Introduction

The success of antiretroviral therapy (ART) to prevent new infections and preserve lives largely depends on the patients' long-term adherence to suppressive antiretroviral regimens. Non-adherence to ART compounded with poor retention of those who have enrolled in treatment programs is an issue largely attributed to increased HIV burden, increase in new HIV infections, and funding constraints posed by other health priorities in the country [1,2,3]. By the end of 2015 global coverage of antiretroviral therapy reached 46% with 17 million on ART. The greatest gains in ART coverage were from the world's most affected region, eastern and

Citation: Ruth Laibon, Michael Kiptoo, Kenneth Ngure, Vincent O Oeba, Charles Sabo, et al. (2016) Correlates of ART Adherence among Male Sex Workers (MSW) in Kenya. BAOJ Hiv 2: 016.

Page 2 of 11

southern Africa. South Africa alone had nearly 3.4 million people on treatment, more than any other country in the world. After South Africa, Kenya has the second largest treatment program in Africa, with nearly 900,000 people on treatment at the end of 2015 [4].

The burden of HIV among men who have sex with men (MSM) and male sex workers (MSW) in Kenya is well understood [5]. Despite the declining generalized epidemic, new infections continue to occur among MSM, MSW and Female Sex Workers (FSW) [6]. In Kenya studies, size estimates for these groups largely focus on high risk MSM, who are primarily MSW and other MSM that reside in hot spots frequented by men who sell sex. One of the largest geographical mapping studies for MSM/MSW, showed that (95.2%) of those enrolled from Nairobi were male sex workers [7]. The National HIV program identifies male sex workers as one of the key populations that require specialized attention due to their significance in the control and management of the HIV epidemic. The program defines male sex workers (MSWs), as "men who exchange sex for money or items of value with other men but may also exchange sex for money with women and high-risk males who cruise pick-up locations looking for male sex partners" [8]. There are approximately 22,000 men who have sex with men/male sex workers in Nairobi County with sub-sets based on sexual behaviors such as transactional or paid sex, exclusive male partners, sexual identity and multiple sexual partnerships. The high HIV prevalence of 18.2% and other behaviors such as whether or not they engage in penetrative and/or receptive sex has implications for the subject's risk of acquiring and transmitting HIV [5,9].

Table 1: Summary of socio-demographic characteristics of the study sample Socio-demographic characteristics

	Category	Frequency (n)	Percentage
Age	19-24	52	20
	25-29	71	27
	30-34	79	31
	Over 35	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
	None	12	5

Globally, men who have sex with men are 19 times more likely to be living with HIV than in general population. Same sex sexual act is criminalized in 78 countries and punishable by death in seven countries. Sex work is illegal in 116 countries [10]. In Kenya, male to male sexual behavior is recognized as a primary risk factor for HIV with 15.2% of new HIV infections attributed to MSM including MSW [5]. The contribution of HIV infection among male sex workers, a key constituent of men who have sex with men, to overall prevalence of HIV in Kenya is significant. A study conducted in Mombasa established that whereas overall HIV prevalence of MSM/MSW workers was 24.6%, those reported to exclusively have male partners had a HIV prevalence of 41%, higher than the HIV prevalence among those with both male and female partners [9].

Male sex workers in Kenya have received less attention compared to their less stigmatized counterparts, female sex workers. Most HIV prevention, care, and support for this group primarily addresses male sex work as a sub-set of men who have sex with men (MSM). Notably, MSW are more likely to experience criminalization and the double stigma associated with male to male sex and sex work. Male sex workers in Kenya have reported facing difficulties in locating trained health providers to address their unique needs, and have consequently avoided or delayed seeking health services. Similarly, many service providers find it difficult to provide non-stigmatizing services to clients perceived to be practicing illegal behavior due to denial and social intolerance [11].

There is a large body of research exploring the problem of adherence to antiretroviral medications. The literature is, to date, dominated by reports identifying factors that are predictive, or are associated with antiretroviral adherence among the general populations. Adherence is increasingly understood as a dynamic behavior influenced by a matrix of interrelated factors that change over time. Male sex workers in Kenya are a unique group in regard to the social, cultural, and religious intolerance that may affect their treatment adherence. In 2013, Graham et al., recommended the need for close attention and monitoring of adherence to ART among MSM/MSW in Kenya [12]. This study therefore aimed to establish the correlates of adherence to ART among MSW in Kenya in order to generate group specific information for targeted intervention.

Methods

This study was conducted in Nairobi County, Kenya. Nairobi County, the capital city, and the largest city in Kenya is one of 47 developed governance units in the country. HIV prevalence in Nairobi County is estimated at 8.6% [13], and the county is home to the largest proportion of MSM/MSW in the country [7]. A cross-sectional survey was conducted between July and August of 2015 with respondents recruited through a combination of peer-based sampling, chain-referrals and convenience sampling at sex work venues.

Respondents were drawn through a community-based organization (CBO) which primarily serves male sex workers and other men

Citation: Ruth Laibon, Michael Kiptoo, Kenneth Ngure, Vincent O Oeba, Charles Sabo, et al. (2016) Correlates of ART Adherence among Male Sex Workers (MSW) in Kenya. BAOJ Hiv 2: 016.

Page 3 of 11

who have sex with men. Prior to commencing data collection an exhaustive list of male sex workers living in Nairobi registered under the CBO, Health Option Health Options for Young men with AIDS / STI (HOYMAS), was developed alongside information on the number of male sex workers enrolled for ART. Factors for inclusion included: self-reported their HIV positive status, being on ART; being born a man, reporting having sold sex for money, goods, or favors in the past 12 months, being over the age of 18, residing in Nairobi, and being able to provide written consent in English or Swahili. The initial seeds were trained on all the study procedures and objectives before being provided with recruitment materials to recruit their peers. Each eligible respondent was given 300 Kenyan Shillings (KES) upon completion of the interview to compensate for their travel expenses.

Sample size calculations were based on an estimated proportion of 78.2% ART adherence among adult men and adjustments made for the differences observed between MSM and heterosexual men [14], which required a minimum of 210 participants. Ultimately, recruitment generated a total of 260 participants who provided written consent and were eligible to participate in the study.

Data was collected using a semi-structured questionnaire programmed into a tablet computer, and the questionnaire was administered using face to face interviews with the research participants. Administration of the questionnaire was completed by a trained interviewer, at a dedicated site, in a private room, where no identifying information was collected. Mobile application Open Data Kit (ODK) was used to administer the survey using a smart phone or tablet.

Respondents could refuse to answer any question. Data from the ODK was exported into Microsoft Excel which was used to compare the data and reconcile discrepancies. Data was then exported to STATA version 12 for analysis.

The research protocol, survey, and consent forms were reviewed and approved by Kenyatta National Hospital –University of Nairobi Ethical Review Committee. All participants provided written informed consent and all study related activities were conducted in a safe and private location at the recruitment venue.

Data Analysis

Data was subjected to descriptive statistical and inferential statistical tests. Specifically, percentages and frequencies were generated for all hypothesized correlates of adherence to ART and demographic characteristics. The chi-square test was used to determine association among correlates and ART adherence among male sex workers (MSW). Self-reporting on adherence to ART was determined using responses based on the following questions: "Have you ever missed any appointments at the clinic where you get your ARVs? ", "Have 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 of your immune system is working properly?". A dummy variable for ART adherence categorized as adhered and non-adhered was generated which resulted to 104 MSW reported self-adhered as compared to

156 who did not adhere. The adhered group are those who negated on the statements while non-adhered group are those that agreed to having missed or skipped taking ARVs, clinic appointments, and not having a CD4 count done. All correlates in the study were cross-tabulated with dummy variables on adherence and chi-square tests were conducted. Significant association was declared at 5%. The final components were further analysed using a logistic regression model where the ART adherence dummy variable was the dependant variable expressed as a function of hypothesised correlates. The interpretation of the logistic regression model was based on the odds ratio, which shows the chance of adherence as influenced by different variables.

Results

Socio-Demographic Characteristics of Study Population

The average age of the respondents was 30 years old,44% (133) had secondary education, and the majority (60%), were never married. Among those married, 12 % were married to a woman and 17% were married to a man. It was established that a high percentage (79 %,159) were cohabiting with a man. More than a third (36 %, 93) had children living in households with a minimum of one and a maximum of 15 members.

The key socio-demographic characteristics assessed for their correlation with self-reported adherence to ART included age; education level; marital status; and religious denomination. There was no significant association between all of the socio-demographic characteristics assessed, and self-reporting of adhering or not adhering to ART.

Reasons for Missing ARV Medication

The study established that close to half (49.2%) of the respondents indicated having ever missed a dose of their ART drugs. The respondents were asked some of the reasons for missing their ART doses (Table 2). A number of reasons were given for skipping medication with each of them significantly associated (p<0.001) with self-reported adherence. The reasons included feeling better; experiencing side effects; being too busy; high pill burden; the clinic not being accessible; lack of care or support money to travel, lack of food; lack of privacy to take medication, sharing of pills; alcohol or drug use and depression, hospitalization (p<0.022); and having no one to remind one to take medication (p =0.075).

Association between Self-Reported Adherence and other Variable

Socio-demographic variables: As indicated in Table 3 there was no significant difference between self-reported adherence and age (p=0.655); education level (p=0.986); religious denomination (p=0.277); or marital status (p=0.425). Other variables that were not significantly associated with self-reported adherence included place of testing (p=0.174); whether the healthcare worker provided information on ARV (p=0.775); and duration on ARV (p=0.082). Knowledge of HIV/ARV (p=0.045) was found to be significantly associated with self-reported adherence.

The following variables were significantly associated with self-

Citation: Ruth Laibon, Michael Kiptoo, Kenneth Ngure, Vincent O Oeba, Charles Sabo, et al. (2016) Correlates of ART Adherence among Male Sex Workers (MSW) in Kenya. BAOJ Hiv 2: 016.

Page 4 of 11

Table 2: Reasons for Missing ARV Medication

Reasons for missing ARV medication	Self Reported Adherence				Chi sq.	P value
	Yes		No			
	n	%	N	%		
Felt better (n=260)					16.6455	<0.001
No	101	97.1	124	79.5		
Yes	3	2.9	32	20.5		
Experienced side effects (n=260)					34.4097	<0.001
No	102	98.1	107	68.6		
Yes	2	1.9	49	31.4		
Too busy (n=260)					67.7083	<0.001
No	102	98.1	78	50		
Yes	2	1.9	78	50		
Pill burden (n=260)					25.1982	<0.001
No	104	100	123	78.8		
Yes	0	0	33	21.2		
Clinic not accessible (n=260)					11.8014	0.001
No	102	98.1	133	85.3		
Yes	2	1.9	23	14.7		
Lack of care or support (n=260)					11.2136	0.001
No	101	97.1	131	84		
Yes	3	2.9	25	16		
Lack of money to travel (n=260)					37.4122	<0.001
No	102	98.1	104	66.7		
Yes	2	1.9	52	33.3		
Hospitalization (n=260)					5.2565	0.022
No	103	99	145	92.9		
Yes	1	1	11	7.1		
Shared pills (n=260)					12.5879	<0.001
No	103	99	135	86.5		
Yes	1	1	21	13.5		
Alcohol or drug use (n=260)					54.4754	<0.001
No	101	97.1	86	55.1		
Yes	3	2.9	70	44.9		
Didn't have the pills (n=260)					32.8443	<0.001
No	97	93.3	96	61.5		
Yes	7	6.7	60	38.5		
Lack of food (n=260)					29.5373	<0.001
No	103	99	115	73.7		
Yes	1	1	41	26.3		
Depressed (n=260)					27.6989	<0.001
No	103	99	117	75		
Yes	1	1	39	25		

Citation: Ruth Laibon, Michael Kiptoo, Kenneth Ngure, Vincent O Oeba, Charles Sabo, et al. (2016) Correlates of ART Adherence among Male Sex Workers (MSW) in Kenya. BAOJ Hiv 2: 016.

Page 5 of 11

Reasons for missing ARV medication	Self Reported Adherence					
	Yes		No			
Distance is too far (n=260)					20.6748	<0.001
No	103	99	125	80.1		
Yes	1	1	31	19.9		
Simply forgot (n=260)					46.982	<0.001
No	102	98.1	95	60.9		
Yes	2	1.9	61	39.1		
Feeling to hide medication (n=260)					33.692	<0.001
No	101	97.1	105	67.3		
Yes	3	2.9	51	32.7		
Don't have any one to remind you take medication (n=252)					3.1758	0.075
No	63	62.4	77	51		
Yes	38	37.6	74	49		

Table 3: Relationship between self reported adherence and other variables

Variables	Self Reported Adherence							
	Yes		No					
	n	%	N	%	Chi sq.	P value	Odds Ratio	CI
Age (n=259)					1.621	0.655		
19-24 years	17	16.5	35	22.4			1.6	(0.7-3.5)
25-29 years	28	27.2	43	27.6			1.1	(0.5-2.4)
30-34 years	33	32	46	29.5			1.1	(0.7-2.2)
Over 35 years (REF)	25	24.3	32	20.5				
Education level of PUI (n=256)					0.0292	0.986		
Primary (REF)	18	17.6	26	16.9				
Secondary	45	44.1	68	44.2			1.1	(0.5-2.1)
Post secondary	39	38.2	60	39			1.1	(0.5-2.2)
Religious Denomination (n=257)					3.8624	0.277		
Muslim	5	4.8	15	9.8			2.4	(0.8-7.2)
Catholic (REF)	41	39.4	51	33.3				
Protestant	55	52.9	78	51			1.1	(0.6-1.95)
None	3	2.9	9	5.9			2.4	(0.6-9.4)
Marital Status (n=256)					2.7903	0.425		
Never married	60	58.3	97	63.4			1.9	(0.8-4.5)
Married to man	16	15.5	28	18.3			2.1	(0.7-5.7)
Married to woman	14	13.6	17	11.1			1.4	(0.5-4.2)
Deserted/separated/divorced (REF)	13	12.6	11	7.2				
Duration of years in Nairobi (n=259)					0.8708	0.351		
0-5yrs (REF)	38	36.5	48	31				
>5 yrs	66	63.5	107	69			1.2	(0.7-2.2)
Main source of income (n=249)					5.7343	0.125		

Citation: Ruth Laibon, Michael Kiptoo, Kenneth Ngure, Vincent O Oeba, Charles Sabo, et al. (2016) Correlates of ART Adherence among Male Sex Workers (MSW) in Kenya. BAOJ Hiv 2: 016.

Page 6 of 11

		Self Reported Adherence						
		Yes		No				
Variables		n	%	N	%	Chi sq.	P value	Odds Ratio	CI
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 (n=260)						4.2712	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				
Received gift/material in exchange for sex (n=260)						0.0681	0.794		
No		20	19.2	28	17.9			1.1	(0.5-2.1)
Yes		84	80.8	128	82.1				
Main reason for getting into 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	(0.9-3.1)
Number of sexual partner last day of work (n=192)						1.257	0.262		
1 (REF)		75	97.4	108	93.9				
2		2	2.6	7	6.1			2.4	(0.5-12)
No. days practice sex in a week (n=182)						0.072	0.788		
0-3		57	77	85	78.7			1.1	(0.5-2.2)
>3		17	23	23	21.3				
Ever experienced Sexual Violence (n=253)									
Yes (REF)									
No								1.1	(0.6-2.1)
Arrested because of Sexual Identity (n=254)						0.08	3.078		
Yes		25	24.5	53	34.8				
No		77	75.5	79	65.2			1.6	(0.9-2.80)
Knowledge status on ARVs and HIV medication (n=260)						6.2173	0.045		
Slightly knowledgeable		4	3.8	8	5.1				
Knowledgeable		19	18.3	49	31.4			1.6	(0.5-5.6))
Very knowledgeable		81	77.9	99	63.5			2.1	(1.1-3.8)
Place of testing (n=257)						3.4964	0.174		
Government health facility		29	27.9	39	25.5			1.1	(0.6-2.3)
Private health facility (REF)		37	35.6	41	26.8				
Special clinic for MSM/MSW		38	36.5	73	47.7			1.7	(0.9-3.1)
Health worker provided information (n=260)						0.0815	0.775		
Health did not provide information first time given ARV (REF)		29	27.9	41	26.3				
Health worker provided information first time received ARV		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		46	45.1	51	34.2				

Citation: Ruth Laibon, Michael Kiptoo, Kenneth Ngure, Vincent O Oeba, Charles Sabo, et al. (2016) Correlates of ART Adherence among Male Sex Workers (MSW) in Kenya. BAOJ Hiv 2: 016.

Page 7 of 11

	Self Reported Adherence							
	Yes		No					
Variables	n	%	N	%	Chi sq.	P value	Odds Ratio	CI
More than a year ago	56	54.9	98	65.8			1.5	(0.9-2.6)

Table 4: Unadjusted and Adjusted model of Self Reported adherence and other variables

| Self Reported Adherence | | | | |
Variables	uOR*	CI	aOR*	CI
Age (n=259)				
19-24 years	1.6	(0.7-3.5)	2.1	(0.5-9.5)
25-29 years	1.1	(0.5-2.4)	0.6	(0.1-3.2)
30-34 years	1.1	(0.7-2.2	0.8	(0.2-3.3)
Over 35 years (REF)				
Education level of PUI (n=256)				
Primary (REF)				
Secondary	1.1	(0.5-2.1)	2.6	(0.6-11.4)
Post secondary	1.1	(0.5-2.2)	3.9	(0.8-19.5)
Religious Denomination (n=257)				
Muslim	2.4	(0.8-7.2)	2.3	(0.4-12)
Catholic (REF)				
Protestant	1.1	(0.6-1.95)	1.6	(0.6-4.3)
None	2.4	(0.6-9.4)	0.9	(0.4-20.4)
Marital Status (n=256)				
Never married	1.9	(0.8-4.5)	0.6	(0.1-5.5)
Married to man	2.1	(0.7-5.7)	1.2	(0.2-6.6)
Married to woman	1.4	(0.5-4.2)	0.8	(0.1-5.5)
Deserted/separated/divorced (REF)				
Duration of Years in Nairobi (n=259)				
0-5yrs (REF)				
>5yrs	1.2	(0.7-2.2)	1.3	(0.4-3.7)
Main source of income (n=249)				
Sex work	1.9	(1.0-3.5)	8.9	(2.8-38.2)
Small business	1.1	(0.5-2.5)	2.7	(0.5-15.3)
Casual laborer (REF)				
Salaried employee	2	(0.8-4.5)	16	(2.8-95.2)
Average monthly income (n=260)				
<1000	1.9	(0.6-5.9)	3.7	(0.2-65.9)
1001-5000	1.5	(0.8-3.0)	0.6	(0.1-2.8
5001-10000	1.7	(0.9-3.1)	1.2	(0.4-3.5)
>10000 (REF)				
Received gift/material in exchange for sex (n=260)				
No	1.1	(0.5-2.1)	1.6	(0.9-2.2)
Yes (REF)				

Self Reported Adherence				
Variables	**uOR***	**CI**	**aOR***	**CI**
Number of sexual partners at the last day of work (n=192)				
1	2.4	(0.5-12)	2.2	(0.5-12.2)
2 or more (REF)				
No. days practice sex in a week (n=182)				
0-3	1.1	(0.5-2.2)	1.2	(0.4-3)
>3 (REF)				
Ever experienced Sexual Violence (n=253)				
Yes (REF)				
No	1.1	(0.6-2.1)	0.5	(0.2-1.7)
Arrested because of Sexual Identity				
Yes (REF)				
No	1.6	(0.9-2.80	1.7	(0.9-2.8)
Knowledge status on ARVs and HIV medication (n=260)				
Slightly knowledgeable (REF)				
Knowledgeable	1.6	(0.5-5.6))	1.6	(0.4-5.3)
Very knowledgeable	2.1	(1.1-3.8)	2.1	(1.4-3.8)
Place of testing (n=257)				
Government health facility	1.1	(0.6-2.3)	1.1	(0.2-3.9)
Private health facility (REF)				
Special clinic for MSM/MSW	1.7	(0.9-3.1)	2.2	(0.7-7.1)
Health worker provided information (n=260)				
Health did not provide information first time given ARV (REF)				
Health worker provided information first time received ARV	1.1	(0.6-1.8)	1.1	(0.5-1.7)
When start taking ARV (n=251)				
Less than a year ago (REF)				
More than a year ago	1.5	(0.9-2.6)	1.6	(0.8-2.4)

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

reported adherence at the multivariate level: those who reported sex work as their main source of income were 8.9 (CI: 2.8-38.2) times likely to be adherent as compared to those who reported being casual laborers, those who had an average income of < than Kshs 1,000were 3.7 (0.2-65.9) times more likely to be adherent as compared to those who had a higher income of >than Kshs 1,000. In regards to sexual knowledge, those who were knowledgeable were 2.1 (CI: 1.4-3.8) times more likely to be adherent as compared to those who were only slightly knowledgeable.

Other non-significant variables included: Younger MSW (19-24) were 2.1 (CI: 0.5-9.5) times more likely to be adhere to ART compared to older ones. Respondents with a post-secondary education were 3.9 (CI: 0.8-19.5) times more likely to be adherent as compared to those with a primary education. Muslims were 2.3 (CI: 0.4-12) times more likely to be adherent as compared to the Catholics. In regards to marital status those who were married to

a man were 1.2 (CI: 0.2-6.6) times more likely to be adherent as compared to those who were deserted/separated/ divorced. Those who lived in Nairobi for greater than 5 years were 1.3 (CI: 0.4-3.7) times more likely to be adherent as compared to those who had stayed in Nairobi for less than 5 years. Respondents that didn't receive gifts/materials in exchange for sex were 1.6 (0.9-2.2) times more likely to be adherent as compared to those that received gifts. Those who had 1 partner were more likely (OR: 2 CI: 0.5-12.2) to be adherent as compared to those that had 2 or more partners. Those who had had not been arrested because of sexual identity were 1.7 times (CI: 0.9-2.8) more likely to be adherent as compared to those who had been arrested.

Discussion

Overall this study established that male sex workers had lower (40%) self-reported adherence than men in the general population (78.2%) [15]. Other previous studies [12] had reported that MSM/

Citation: Ruth Laibon, Michael Kiptoo, Kenneth Ngure, Vincent O Oeba, Charles Sabo, et al. (2016) Correlates of ART Adherence among Male Sex Workers (MSW) in Kenya. BAOJ Hiv 2: 016.

Page 9 of 11

MSW had the lowest overall adherence, and had poor weight gain compared to women and other heterosexual men in ART treatment programs. These findings are also consistent with other studies that showed men who have sex with men in Africa are often reluctant to access care due to stigma, attitudes, and laws that prohibit adult same-sex behavior [16]. The low treatment adherence levels of this group are amidst acknowledgement that even episodic non-adherence to antiretroviral therapy can lead to viral mutations and drug resistance. Patient adherence to ART must be nearly perfect (95%) to achieve and sustain viral suppression, maintain immune health, and slow disease progression [1, 17]. Other consequences of non-adherence include likelihood of being more infectious [18-21]. Sex work plays a key role in the Kenyan HIV epidemic with earlier studies attributing 15.2 % of all new HIV infections to sex workers and their clients [5], therefore treatment adherence in management and control of HIV among MSW is critical.

The assessment of treatment adherence through self-reporting measures employed in this study was consistent with a national survey that established a relationship of clinical assessment with self-reports on missed doses and appointments. Individuals who reported not missing an ART dose in the 30 days preceding the survey had significantly higher viral suppression at 78%, compared to 57.9% among those reported they had missed taking a pill (non-adherent) in the same period [14]. It is well recognized that there is no gold standard of treatment adherence measures, and a combination of more than one measure strengthens the accuracy [22].

This study established a number of reasons that were associated with skipping medication other studies documented that that missing drug intake was mainly related to a state of well-being feeling experienced by the patients, lack of a square meal a day (specific factor in Africa on which the medication intake is regulated) [23], and a feeling of weariness suitable for all long-term treatment. Lack of food to take with medication was described as a major problem in this study. It has been established that inaccessibility of the clinic due to distance and lack of transport is associated with treatment adherence. It was also interesting to note that being hospitalized was associated with skipping medication. Other factors such as location of undertaking an HIV test and the reasons for taking the test did not to influence adherence.

This study found that one in every three of the MSW had been arrested by police because of their sexual orientation, and that the majority of those arrested were non adherent to ART. Despite the fact that police arrest was not significantly associated (P=0.079 with non-adherence to ART at p<0.05), its prevalence is an important consideration for this group. The finding on experience of violence was further compounded by the fact that one in every four of those interviewed had been forced to have sex. Male violence against women is rightly understood to be a public health crisis in Kenya due to its high prevalence and established risk with HIV infection. Increasingly, Male violence in the general population in Kenya has started to receive media attention. The high levels of MSW sexual violence reported indicates that MSW are far more likely than other men to experience sexual assault, indeed, the prevalence of sexual violence reported by MSW in this study is not comparable to the prevalence (43%) of sexual violence reported by Kenyan female sexual workers [24].

This study established a non-significant relationship between the sexual behavior of MSW and their adherence to ART. It was noted upon binary analysis that 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 having a higher odd of being adherent as compared to those with more partners and more days of sexual work. However, studies show that sexual behavior of people of people living with HIV has remained a critical component of treatment programs. 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 [25]. Results of a meta-analyses conducted both in high- and low-resource settings [26] 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). Similar findings were also reported in other studies [27]. Few studies 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 [28].

The level of ART knowledge was significantly associated with self-reported adherence among MSW in this study, and other studies have established similar findings. In a study conducted with the general population in South Africa, poor knowledge of HIV and ART was attributed to poor adherence [29]. Similarly, a study conducted in Togo showed that only 55 % of the HIV-infected patients were aware of the names of their prescribed ART medication(s) [30]. Over 90 % of HIV-infected women in Ghana had inadequate knowledge of ART, and these women were much more likely to default from prevention of mother to child transmission care [31]. Another study conducted in Ethiopia to establish association of knowledge on the treatment plan, regimen, and adherence found those who were knowledge were more likely to be adherent than those who were not [32], which suggests knowledge on different components of ART is crucial in improving patient adherence.

Age, education level, marital status, religious denomination, and average monthly income were not significantly associated with self-reported adherence. The findings in this study are consistent with a meta-analytic study by [33], which examined available evidence and found inconclusive support for a clear association between socio-economic status (income, education, occupation/employment) and adherence to ART among patients infected with HIV/AIDS in low- and middle-income countries. This finding was amidst observations of a positive trend of association between components of socio-economic status (SES) and adherence to antiretroviral therapy in many of the reviewed studies. This study concluded that association between SES and adherence may therefore differ depending on the cultural, economic and geographic context of the countries studied, and emphasized the need for a site-specific approach to adherence

Citation: Ruth Laibon, Michael Kiptoo, Kenneth Ngure, Vincent O Oeba, Charles Sabo, et al. (2016) Correlates of ART Adherence among Male Sex Workers (MSW) in Kenya. BAOJ Hiv 2: 016.

Page 10 of 11

studies and programs. Other studies observed that people living in conducive social environments had higher adherence rates, while those living in conditions of deprivation with the later displayed limited urgency to adhere to treatment [34,35].

The results of our study, coupled with findings of much lower ART adherence levels among the MSW, underpins the need to design effective programs targeting key determinants of ART adherence among members of this important group. There is a need to design interventions that particularly address the main determinants of failure to adhere to ART, and the broader social, legal, cultural, and religious intolerance that affect the access of MSW to health treatment and healthcare resources. The findings of this study are important to advise both policy and programs targeting MSW.

Limitations

It has been recognized that this study was limited in multiple ways. Just before the study commenced a number of heightened public interest cases against the location of the recruitment site had been witnessed. The findings must also be interpreted cognizant of the problems associated with self-report measures such as introspective ability, honesty/image management, as well as the impact of these factors on the study results.

Conclusions

Overall, the findings from this study indicate that there is a need to address factors that increase likelihood of adherence for key groups including MSW. Adherence is a complex issue which requires multiple approaches to address, and adherence rates found in MSW are lower than those of men in the general population. Efforts to improve the level of adherence for this group require a collaborative approach involving the patient, the community, health workers and policy-makers to address the structural constraints of adherence. Integration of interventions to address alcohol and drug use, and violence prevention to enhance treatment adherence for male sex workers living with HIV is also important.

Acknowledgments

References

1. 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? Clin Infect Dis 50(5): 752–761.

2. Giordano T, Gifford A, White A, Suarez-Almazor ME, Rabeneck L, et al. (2007) Retention in care: a challenge to survival with HIV infection. Clin Infect Dis 44(11): 1493–1499.

3. Mugavero M, Davila J, Nevin C, Giordano T (2010) From access to engagement: measuring retention in outpatient HIV clinical care. AIDS Patient Care STDS 24(10): 607–613.

4. UNAIDS (2016) Global AIDS Update.

5. GelmonL, Kenya P, Oguya F, Cheluget B, Girmay H (2009) Kenya HIV Prevention Response and Modes of Transmission Analysis. National AIDS Control Council.

6. Baral S, Beyrer C, Muessig K, Poteat T, Wirtz AL, et al (2012) Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. Lancet Infect Dis 12(7): 538–549.

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

8. Ministry of Public Health and Sanitation [MOPHS], Kenya, 2010.

9. Sanders EJ, Graham SM, Okuku HS, Elst EM, Muhaari A, et al. (2007) HIV-1 Infection in High Risk Men Who Have Sex With Men in Mombasa, Kenya. AIDS 21(18): 2513-2520.

10. UNAIDS (2014) Global AIDS Progress report.

11. Ouma W, Birungi H, Geibel S (2005) Understanding the HIV/STI risks and prevention needs of men who have sex with men in Nairobi, Kenya. Horizons Final Report. Washington: Population Council.

12. Graham SM, Mugo P, Gichuru E, Thiong'o A, Macharia M, et al. (2013) Adherence to antiretroviral therapy and clinical outcomes among young adults reporting High-Risk Sexual Behavior, Including Men Who Have Sex with Men, in Coastal Kenya. AIDS Behav 17:1255–1265.

13. National AIDS Control Council and National STI Control Programme HIV (2014) HIV Estimates and projections. Nairobi Kenya.

14. Muraguri N, Tun W, Okal J, Broz D, Raymond HF, et al. (2015) HIV and STI prevalence and risk factors among male sex workers and other men who have sex with men in Nairobi, Kenya. J Acquir Immune DeficSyndr 68(1): 91–96.

15. Ministry of Health (2012) Kenya AIDS Indicator Survey.

16. Fay H, Baral SD, Trapence G, Motimedi F, Umar E, et al. (2011) Stigma, health care access, and HIV knowledge among men who have sex with men in Malawi, Namibia, and Botswana. AIDS Behav 15(6): 1088–1097.

17. Marks G, Gardner L, Craw J, Crepaz N (2010) Entry and retention in medical care among HIV-diagnosed persons: a meta-analysis. AIDS 24(17): 2665–2678.

18. Paterson DL, Swindells S, Mohr J, Brester M, Vergis EN, et al. (2000) Adherence to protease inhibitor therapy and outcomes in patients with HIV infection. Annals of Internal Medicine 133(1): 21-30.

19. Beyrer C, Baral SD, Walker D, Wirtz AL, Johns B, et al. (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 Rev 32: 137–151.

20. Quinn TC, Wawer MJ, Sewankambo N, Serwadda D, Chuanjun Li, et al. (2000) Viral load and heterosexual transmission of human immunodeficiency virus type 1. Rakai Project Study Group. N Engl J Med 342(13): 921–929.

21. Bangsberg D (2006) Less than 95% adherence to non-nucleoside reverse transcriptase inhibitor therapy can lead to viral suppression. Clinical Infectious Diseases 43(7): 939-941.

22. Vitolins MZ, Rand CS, Rapp SR, Ribisl PM, Sevick MA (2000) Measuring adherence to behavioural and medic interventions. Controlled Clinical Trials 21(5 Suppl): 188S-194S.

23. Weiser S, Wolfe W, Bangsberg D, Thior I, Gilberg P, et al. (2003) Barriers to antiretroviral adherence for patients living with HIV infection and AIDS in Botswana. J Acquir Immune Defic Syndr 34(3): 281–288. doi: 10.1097/00126334-200311010-00004.

24. Chersich MF, Luchters SM, Malonza IM, Mwarogo P, Kingola N, et al. (2007) Heavy episodic drinking among Kenyan female sex workers is associated with unsafe sex, sexual violence and sexually transmitted infections. International Journal of ATDs 18(11): 764–769.

25. Dunkle KL, Stephenson R, Karita E, Chomba E, Kayitenkore K, et al. (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(9631): 2183–2191.

26. Crepaz N, Hart TA, Marks G (2004) Highly active antiretroviral therapy and sexual risk behavior: a meta-analytic review. Jama 292(2): 224–236.

27. Wandera B, Kamya MR, Castelnuovo B, Kiragga A, Kambugu A, et al. (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. J Acquir Immune Defic Syndr 57(1): 62-68.

28. Laurent C, Kouanfack C, Laborde-Balen G, Aghokeng AF, Mbougua JB, et al. (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 (Stratall ANRS 12110/ESTHER): a randomised non-inferiority trial. Lancet Infect Dis 11(11): 825–833.

29. Terblanche LM, Stellenberg EL (2014) Patient knowledge of HIV and its treatment in South Africa. African J Prim Health care Family Med 6(1): E1–7.

30. Potchoo Y, Tchamdja K, Balogou A, Pitche VP, Guissou IP, et al. (2010) Knowledge and adherence to antiretroviral therapy among adult people living with HIV/AIDS treated in the health care centers of the association "Espoir Vie Togo" in Togo, West Africa. BMC Clin Pharmacol 10: 11.

31. Boateng D, Kwapong GD, 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. BMC Women's Health 13: 2.

32. 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. Int J Basic Clin Pharmacol 3(2): 320–330.

33. 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.

34. Farmer P (1997) Social scientists and the new tuberculosis. SocSciMed 44(3): 347–358.

35. Simoni JM, Huh D, Frick PA, Pearson CR, Andrasik MP, et al. (2009) Peer support and pager messaging to promote antiretroviral modifying therapy in Seattle: A randomized controlled trial. J Acquir Immune Defic Syndr 52(4): 465–73.