

## The Sexual Behaviours of HIV Positive Patients Receiving Antiretroviral Therapy in HIV Treatment Centre in Nigeria

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### Abstract

**Background:** Sexual risk behaviour is a global health concern. Unsafe sex practices increase the risk of HIV transmission to sex partners. This study assessed the knowledge of HIV transmission and sexual risk behaviours of patients accessing antiretroviral therapy (ART) in secondary health facility in Nigeria.

**Methods:** In a cross sectional study, a study-specific questionnaire was self-administered to randomly selected 350 out of 5770 patients accessing ART. A midpoint of Likert-type scale was determined; and values above were positive while below were negative. Chi square was used for inferential statistics at 95% confidence interval.

**Results:** Of participants, 57.1% were female and 28.6% aged  $\geq 40$  years old. Knowledge of routes of HIV transmission and risk reduction associated with condom use was negative. Participants had positive attitudes to non-disclosure of HIV sero-status, multiple sex partners and unprotected sexual intercourse. Majority (63.7%) had one sex partner, 16% had  $>1$  sex partners and 12.6% had none. Number of sex partners was associated with sex, marital and occupational status ( $P < 0.05$ ) unlike educational status; 66.2% of those who had one sex partners were married; 56.9% and 46.7% of those who had  $>1$  sex partners were males and retirees respectively. Majority (66.3%) disclosed HIV sero-status to sex partners but only 62.6% knew HIV sero-status of their sex partners. Disclosure was associated with marital status ( $P < 0.05$ ) unlike sex and educational status. Only 28.9% consistently used condom during sexual intercourse; and 67.6% of them were aged  $>30$  years old, while 55.7% were married. Consistent use of condom was associated with marital status and age ( $P < 0.05$ ) unlike educational status.

**Conclusion:** There were poor knowledge of routes of HIV transmission and benefits of condom use. Few participants consistently used condom during sexual intercourse. Majority had one sex partner and disclosed HIV sero-status to sex partners. Ongoing counselling and education should be integrated into HIV prevention strategies.

**Keywords:** Sexual; Practice; Knowledge; HIV/AIDS; ART; Patients; Nigeria

### Introduction

The sexual risk behaviour of HIV positive adult patients as well as general population is a global health concern [1]. It has been reported that HIV infections could affect one's sexual functions [1]. The risk estimates for sexual transmission of HIV, per sex act, vary widely from 0.5% to 3.38% for receptive anal intercourse, 0.06% to 0.16% for insertive anal intercourse, 0.08% to 0.19% for receptive vaginal intercourse (male-to-female); and 0.05% to 0.1% for insertive vaginal intercourse (female-to-male). The risk of transmission from unprotected oral intercourse is markedly lower than for anal or vaginal intercourse but the risk of transmission to the receptive partner increases with ejaculation and the presence of oral ulcers and sexually transmitted infections (STIs) in the oropharynx [2]. Heterosexual transmission accounts for the majority of HIV transmissions in Nigeria [3]. Estimated 34.6% of new HIV infections occur among couples considered as engaging in 'low-risk' sex, while 23.0% occur among most at risk populations (MARPs). More than a third of all

new infections were linked to female sex workers, their clients and partners [3,4].

The widespread of unprotected sexual intercourse has been reported among both HIV sero-positive persons and individuals of unknown HIV sero-status [1]. Concomitant STIs increase susceptibility to HIV by a factor of 2 to 4 than uninfected individuals if they are exposed to the virus through sexual contact [2,5]. High viral load during early and late-stage HIV infection may increase HIV transmission risk. As plasma viral load increases, the risk of transmission also increases [6]. An increased transmission of STIs among HIV infected persons have been reported [7,8]. This increased occurrence of STIs among HIV-infected persons are not only markers of unsafe sexual activity, but a contributory factor in increasing potential for HIV transmission due to the synergistic effect of ulcerative STIs on HIV infectivity [9]. The transmissibility of HIV among HIV-infected individuals with concomitant STIs increase by 2 to 3 times than other HIV-infected persons through sexual contact [2,5].

Antiretroviral therapy (ART) has increased the life expectancy, drastically reduced the tendency for social and emotional depression and paradoxically raises urge and sexual functions in sexually inactive

HIV-infected adult patients [10]. This may create more opportunities for continued or relapse to sexual risk behaviours, and may result in transmission of new HIV resistance strains [11]. Several studies have documented a reduction in sexual risk behaviours among persons infected with HIV after initiating ART compared to those not accessing ART despite the high possibility that both groups had contacts with health workers and exposure to HIV prevention messages [12-15]. Although, HIV-positive patients receiving ART have more regular contacts with health workers and are likely to be exposed to more HIV prevention messages [15]. Patients who were very optimistic about effectiveness of ART may develop relaxed attitudes towards sexual risk practices [16-19]. The prevalence of unprotected sex was not higher among those receiving ART than those not on ART [20]. Unsafe sex practices increase the risk of HIV transmission to discordant partners. The use of antiretroviral therapy can reduce the risk of an HIV-infected person transmitting the infection to another by as much as 96% [21], and consistent use of condoms reduces the risk of getting or transmitting HIV by about 80% [6,22]. Using both condoms and antiretroviral therapy reduces the risk of HIV acquisition from sexual exposure by 99.2% [6,23].

It has been shown that HIV infected person who knows his/her status tends to reduce the activities that could cause risk to others [24]. Some reports suggest that such changes in behaviour are not maintained in a substantial proportion of persons infected with HIV [25,26]. However, only a minority of HIV infected pregnant women disclosed their HIV sero-status to their sex partner and they found it difficult to avoid unprotected sexual relations [11]. It was also reported that male gender plays a major role in disclosure of status to sex partners better than female gender [27]. The non-disclosure of HIV sero-status aids the transmission of the infection to HIV-negative sexual partners. In addition, HIV-positive patients may be ignorant of the risk of re-infection with HIV resistance strains if their sex partner is also HIV sero-positive following unsafe sex practice [27,28]. In United States of America, study findings showed that less than 25% of heterosexual men and women had two or more sexual partners, while 59% of men with same sex partner (MSM) reported having multiple partners [29]. In Kenya, about 50% of HIV-positive patients were sexually active and engaged in unsafe sex practices in the 12 months prior to ART; and majority had one sexual partner. After 12 months of ART with counselling and guidance, there was a reduction of sexual activity to 28%, although the unsafe sexual habits were still alarming [12]. There is paucity of data on the sexual risk behaviours of HIV-positive patients in Nigeria. It therefore becomes necessary to gather information about the knowledge and sexual risk behaviours of HIV-positive patients in Nigeria. This study assessed the knowledge of HIV transmission and sexual risk behaviours of HIV-positive adult patients accessing antiretroviral therapy in a secondary public health facility in Nigeria.

## Methods

### Study design

A cross sectional research was carried out to assess the knowledge of HIV transmission and sexual risk behaviours among HIV-positive adult patients accessing antiretroviral therapy.

### Setting

The study was conducted in Asokoro General Hospital, a secondary public health facility that is located in Asokoro district, Federal Capital

Territory, Abuja, Nigeria. Patients from the district and environs come to the hospital for HIV testing and counselling; and those who tested positive for HIV and eligible to start ART are commenced on treatment based on the Nigeria national treatment guideline [3]. HIV care and treatment services in the hospital commenced in 2007 and are provided at no cost to the patients with funding support from United States President's Emergency Plan for AIDS Relief (PEPFAR) through US Centre for Disease Control and Prevention (CDC).

### Selection criteria

All HIV positive patients who were  $\geq 18$  years receiving ART in Asokoro general hospital at the time of the study were eligible to be included. All HIV patients who did not meet these criteria were excluded from the study.

### Study population and sample

The study population included 5,770 adult HIV positive patients who were currently receiving ART in the study site during the study period. From this population, 350 patients were selected for the study using simple random sampling technique. The sample size calculated using the Fisher's formula.

### Pre-testing of study instrument

The study instrument was pretested in a random sample of twenty eligible patients. The study instrument was self-administered and the data collected were analysed for study feasibility and reliability. These were excluded from the main study to avoid bias. The instrument was also circulated to expert colleagues for review and modification for content validity.

### Ethical consideration

Ethical approval for this study was obtained from the Federal capital territory health research Ethics committee, Abuja Nigeria. A consent form was administered to the patients before the administration of study instrument.

### Data collection

The study questionnaire was self-administered to patients with an introductory letter indicating the purpose of the research and background of the researchers. The questionnaire had four sections that covered: a) socio-demographic data; b) patient's knowledge of HIV infection; c) sexual practices of the patients and d) health status of the patient. The participants who gave consent were offered a seat in a private room to fill the questionnaire by themselves; and they were allowed to ask questions for clarification (where necessary). The illiterate participants were read both the participants' information sheet and the consent form for their responses. Only those who gave consent were read the questions and the options in the questionnaire; and their responses were filled into the study instrument by the researchers.

### Data analysis

Predictive Analytical Software (PASW) was used for data entry and analysis. Descriptive statistics including frequency distribution was performed; and Likert-type rating scale was also used. Negatively worded items were reverse coded so that higher scores represent

higher knowledge, attitudes or perception. The mean item scores were calculated for the individual items by adding all scores for each item and divided by the number of respondents. A midpoint of the five-point Likert-type scale was determined by adding all the scores and computing the average. The mean scale scores above the midpoint were regarded as positive knowledge, attitudes or perception, while below the mid-point were considered as negative knowledge, attitudes or perception. Standard deviation was also determined. Chi square was used for inferential statistics; and P values were two-tailed at 95% confidence interval.

## Results

### Social-demographic characteristics of participants

From a total number of 350 participants, 200 (57.1%) were female; 100 (28.6%) aged 40 years old and above; 151 (43.1%) had post-secondary education; 182 (52.0%) were married 106 (30.39%) were self-employed; while 93 (26.6%) earned up to 40,000 naira and above as monthly income (Table 1).

Characteristics	Frequency	Percentage (%)
<b>Sex</b>		
Male	141	40.3
Female	200	57.1
Not indicated	9	2.6
<b>Age group (years)</b>		
15 – 20	10	2.9
21 – 25	32	9.1
26 – 30	87	24.9
31 – 35	59	16.9
36 – 40	60	17.1
> 40	100	28.6
Not indicated	2	.6
<b>Educational status</b>		
None	2	.6
Primary	36	10.3
Secondary	143	40.9
Post-secondary	151	43.1
Not indicated	18	5.1
<b>Marital status</b>		
Single	89	25.4
Married	186	53.1
Separated	10	2.9
Divorced	14	4.0
Widow	41	11.7

Not indicated	10	2.9
<b>Occupational status</b>		
Public sector employee	79	22.6
Private sector employee	86	24.6
Self-employed	106	30.3
Retired	15	4.3
Student	15	4.3
Unemployed	25	7.1
Not indicated	24	6.9
<b>Average monthly income (Naira)</b>		
<10,000	66	18.9
10,000 - 19,000	44	12.6
20,000 - 29,000	35	10.0
30,000 - 39,000	44	12.6
40,000 and above	93	26.6
Not indicated	68	19.4

**Table 1:** Socio-demographic characteristics of the study participants; N=350.

### Knowledge of HIV/AIDS

Of the participants, 162 (46.3%) knew their HIV sero-status for more than 2 years ago, 101 (28.9%) knew for 1-2 years ago, 44 (12.6%) knew less than 6 months ago, 34 (9.7%) for 6-11 months ago, while 9 (2.6%) did not provide this information. Of the participants, 143 (40.9%) have been taking HIV medicines for more than 2 years, 105 (30.0%) for 1-2 years, 52 (14.9%) for less than 6 months, 36 (10.3%) for 6-12 months, while 14 (4.0%) did not indicate. On assessment of how participants thought they were infected, 59.7% did not know how they got infected with HIV infection, 24.9% reported through unprotected sexual intercourse, 6.3% reported through blood transfusion, 4.6% through sharing unsterilized needles/sharp objects, 1.1% reported they got HIV infection from birth and 3.4% did not indicate. The participants' knowledge of HIV infection regarding the routes of HIV transmission related to witchcraft and unprotected sexual intercourse; and HIV transmission risk reduction associated with consistent and correct use of condom was negative (Table 2).

### Sexual practices

Of the participants, 242 (69.1%) reported practising heterosexual vaginal intercourse, 5(1.4%) heterosexual anal intercourse, 8 (2.3%) homosexual anal intercourse (male-to-male), 6 (1.7%) unprotected oral intercourse, 6 (1.7%) homosexual vaginal intercourse (female-to-female), 42 (12.0%) reported not having intercourse of any type while 41 (11.7%) did not indicate their sexual practice. Of the participants, 223 (63.7%) reported that they had one sex partner, 42 (12.0%) had two sex partners, 8 (2.3%) had three sex partners, 6 (1.7%) had more than three sex partners, 44 (12.6%) had no sex partner, while 27 (7.7%) did not indicate whether or not they have sex partners.

The association between participants' marital status and number of sex partners was statistically significant ( $P=0.000$ ). Of the participants who had more than one sex partners, 21 (37.5%) of them were married, 19 (33.9%) were single, 16 (28.6%) were separated, divorced or widowed; while 66.2% of participants who reported having one sex partner were married.

The number of sex partners was not associated with the educational status of the participants ( $P=0.113$ ) unlike the occupational status of the participants ( $P=0.000$ ). There were 13.9% of public sector employee, 22.1% of private sector employee, 16.0% of self-employed,

46.7% of retirees, 6.7% of students and 4.0% of unemployed that had more than one sex partners. There was a significant association between sex and the number of sex partners ( $P=0.030$ ); 56.9% of male participants reported having more than one sex partner compared to 43.1% for females.

Of the participants, 277 (79.2%) of them were comfortable discussing their sexual behaviour with their health provider, 57 (16.3%) were uncomfortable having this kind of discussion, 10 (2.9) were neutral while 6 (1.7%) did not indicate.

Question items	Mean ( $\pm$ SD)	Strongly agree	Agree	Unsure	Disagree	Strongly disagree	Total, N
Sexual transmitted diseases increases the risk of HIV infection	4.5 (0.9)	225 (67.2)	77 (23.0)	17 (5.1)	6 (1.8)	10 (3.0)	335 (95.7)
Consistent and correct use of condoms does not reduce the risk of HIV transmission	3.3 (1.4)	54 (16.1)	65 (19.3)	24 (7.1)	126 (37.5)	67 (19.9)	336 (96.0)
Both HIV positive mother and father can born a child without HIV infection if properly guided	4.5 (0.7)	207 (61.1)	105 (31.0)	17 (5.0)	9 (2.7)	1 (0.3)	339 (96.9)
Having sexual intercourse during menstruation increases risk of HIV transmission.	4.0 (1.2)	158 (47.4)	74 (22.2)	54 (16.2)	25 (7.5)	22 (6.6)	333 (95.1)
Unprotected sexual intercourse cannot lead to transmission of HIV infection.	3.7 (1.4)	48 (14.5)	34 (10.3)	7 (2.1)	127 (38.5)	114 (34.5)	330 (94.3)
Keeping to only one sex partner increases risk of HIV transmission.	3.9 (1.1)	19 (5.6)	29 (8.6)	9 (2.7)	173 (51.3)	107 (31.8)	337 (96.3)
HIV can be gotten through witchcraft?	3.4 (1.5)	61 (18.5)	27 (8.2)	61 (18.5)	77 (23.4)	103 (31.3)	329 (94.0)

\*Mean value <3.9 denotes negative knowledge of HIV/AIDS by the participants while  $\geq 3.9$  denotes positive knowledge of HIV/AIDS.

Table 2: Assessment of participants' knowledge of HIV infection; values in parenthesis are percentages.

### HIV status disclosure

On HIV sero-status disclosure, 232 (66.3%) of participants disclosed to their sex partner(s), 80 (22.9%) did not disclose, while 38 (10.9%) did not indicate. Of the participants that disclosed HIV sero-status to their sex partner, 196 (84.5%) disclosed immediately after testing positive for HIV, 19 (8.2%) disclosed within 6 months, 11 (4.7%) disclosed 6-12 months while 6 (2.6%) more than 12 months after testing positive for HIV.

There was a significant association between disclosure of HIV sero-status to sex partner and the knowledge of participants regarding the HIV sero-status of their sex partner ( $P=0.000$ ). Of the participants, 219 (62.6%) of participants knew the HIV sero-status of their sex partners [of which 116 (53.0%) reported that their sex partners were HIV positive, 101 (46.1%) were HIV negative and 2 (0.9%) did not indicate]; 103 (29.4%) did not know the HIV sero-status of their sex partners while 28 (8.0%) did not respond to the question item.

There was no significant association between sex and disclosure of HIV sero-status ( $P=0.177$ ). Of the participants who disclosed HIV sero-status to their sex partners, 44.9% of them were males while 55.1% were females.

There was a significant association between disclosure of HIV sero-status and marital status ( $P=0.000$ ). Of participants who disclosed HIV sero-status to their sex partner(s), 157 (67.7%) of them were married, 33 (14.2%) were single, while 42 (18.1%) were separated, divorced or widow.

There was no association between HIV sero-status disclosure and educational status of the participants ( $P=0.107$ ). Participants who reported feeling comfortable discussing their sex life with health workers are more likely to disclose HIV sero-status to their sex partner. This association was statistically significant ( $P=0.000$ ).

### Sexual urge or performance

Of the participants, 77 (22.0%) reported that their sexual urge/performance remained the same before and after commencement of antiretroviral therapy (ART), 55 (15.7%) reported increased sexual urge after starting ART, 152 (43.4%) reported decreased sexual urge after starting ART, 32 (9.1%) of them were not sure of any change in sexual urge/performance while 34 (9.7%) did not indicate. Of the participants, 181 (51.7%) never used drugs to enhance their sexual urge or performance, 39 (11.1%) used rarely, 51 (14.6%) used

sometimes, 20 (5.7%) used drugs most of the time, 19 (5.4%) used drugs all the times to enhance sexual urge or performance.

The age of participants was associated with the use of drug(s) to improve sexual urge or performance (P=0.006). Of participants who frequently used drugs to improve their sexual urge or performance, 43.6% of them were aged 31-40 years old, 35.9% aged 21-30 years old, while 20.5% were aged >40 years old.

The use of drugs to improve sexual urge or performance was not associated with educational status of participants (P=0.360). There were 54.7% male participants who reported using drugs to improve their sexual urge or performance sometimes at the least compared to 23.0% for female participants; and the difference is statistically significant (P=0.003). Of the participants who reported having decreased sexual urge or performance, 33.3% were males while 66.7% were females. For those who reported increased sexual urge or performance, 70.9% were males while 29.1% were females. The association between participants' sex and sexual urge or performance was statistically significant (P=0.000).

### Use of condoms during sexual intercourse

On the consistent use of condom by participants, only 101 (28.9%) of them used condom all the time during sexual intercourse, 66 (18.9%) used most of the time, 75 (21.4%) used sometimes, 20 (5.7%) used rarely, 40 (11.4%) of them never used condom during sexual intercourse, while 48 (13.7%) did not indicate.

The participants' marital status (P=0.000) and age (P=0.047) were significantly associated with condom use during sexual intercourse. Of the participants who frequently used condom during sexual intercourse, 55.7% of them were married, 39.5% were single, separated, divorced or widowed while 4.8% did not indicate their marital status. Of participants who used condom frequently during sexual intercourse, 37.7% of them were aged 31-40 years old, 30.5% aged 21-30 years old, 29.9% were aged >40 years old, while 1.8% were aged <21 years old. The use of condom during sexual intercourse was not associated with educational status of participants (P=0.358).

Question items	Mean (±SD)	Strongly agree	Agree	Unsure	Disagree	Strongly disagree	Total, N
My HIV status is personal and I will not disclose it to my sex partner	3.7 (1.5)	56 (16.6)	33 (9.8)	4 (1.2)	120 (35.5)	125 (37.0)	338 (96.6)
I have more than one sex partners because I have nothing to be scared of since I am already positive	4.1 (1.3)	27 (8.0)	34 (10.1)	5 (1.5)	100 (29.6)	172 (50.9)	338 (96.6)
I will not disclose my HIV status to my partner because I am scared he/she will leave or reject me.	3.9 (1.2)	24 (7.1)	38 (11.2)	12 (3.6)	146 (43.2)	118 (34.9)	338 (96.6)
I have unprotected sexual intercourse with my partner who is not HIV positive	3.7 (1.3)	28 (9.2)	45(14.8)	19 (6.3)	118 (38.8)	94 (30.9)	304 (86.9)
I do not like using condom during sexual intercourse	3.6 (1.3)	21 (6.5)	79 (24.4)	7 (2.2)	124 (38.3)	93 (28.7)	324 (92.6)
My sex partner does not like to use condom during sexual intercourse	3.3 (1.4)	35 (11.1)	87 (27.6)	19 (6.0)	108 (34.3)	66 (21.0)	315 (90.0)
My sex partner is also HIV positive therefore, we do not need to use a condom during sexual intercourse	3.7 (1.3)	36 (11.3)	37 (11.6)	24 (7.5)	115 (35.9)	108 (33.8)	320 (91.4)
I do not like to use condom during sexual intercourse because I want to have children	2.7 (1.5)	99 (30.2)	75 (22.9)	25 (7.6)	68 (20.7)	61 (18.6)	328 (93.7)
Use of drugs for HIV will stop the transmission of HIV to sex partner(s)	3.1 (1.4)	65 (19.3)	66(19.6)	32 (9.5)	105 (31.2)	69 (20.5)	337 (96.3)
It is necessary to use condom during sexual intercourse when both partners are HIV positive to prevent infection with other types of HIV	3.9 (1.4)	156 (45.9)	98 (28.8)	21 (6.2)	28 (8.2)	37 (10.9)	340 (97.1)

\*Mean value <3.6 denotes negative attitudes or perceptions toward sexual risk behaviourswhile ≥3.6 denotes positive attitudes.

**Table 3:** The participants' attitudes or perceptions toward sexual risk behaviours; values in parenthesis are percentages.

### Attitudes or perception towards sexual risk behaviours

The participants had positive attitudes toward sexual risk behaviours related to non-disclosure of HIV sero-status, multiple sex partners and some unsafe sex practices (Table 3). The participants'

attitudes as it relate to the use condom during sexual intercourse among women who have desires to become pregnant was negative. Although the perception of the participants on the necessity of condom usage during sexual intercourse for both HIV-positive sex

partners to prevent infection of other strains of HIV was positive; there was a negative perception that the use of antiretroviral drugs will stop the transmission of HIV to sex partners (Table 3).

## Discussion

About three-quarter of the participants had been HIV sero-positive for more than 12 months during the study period. It is expected that the participants were exposed to continual HIV counselling and education during this period. However, the study findings showed poor knowledge of routes of HIV transmission and risk reduction associated with consistent and correct use of condom. HIV pre-test counselling, all clients testing positive for HIV should be provided post-test and ongoing HIV counselling and education to improve knowledge of HIV and reinforce positive living. This should be an integral component of HIV prevention and mitigation strategies.

However, about three-quarter of the participants agreed to the necessity of condom usage during sexual intercourse when both partners are HIV positive to prevent infection with other types of HIV. This is contrary to the suggestion made by Kozal et al. that HIV-positive patients may be ignorant of the risk of re-infection with HIV resistance strains if their sex partner is also HIV sero-positive following unsafe sex practice [28].

Heterosexual transmission accounts for the majority of HIV transmissions in Nigeria [3]. This is consistent with the study findings that majority of the participants (over three-fifth) engaged in heterosexual vaginal intercourse. The participants' attitudes toward sexual risk behaviours related to multiple sex partners and some unsafe sex practices such as unprotected sexual intercourse was positive. Majority of them had one sex partner and were comfortable discussing their sexual behaviours with their health providers. This is somewhat consistent with previous research findings in Kenya [12]. Less than one-fifth of participants had more than one sex partners. This is consistent with previous research findings [29].

The participants' marital status, sex and occupational status had significant association with the number of sex partners. Majority of the participants who had more than one sex partner were single, separated, divorced or widowed; and also males, retirees and private sector employees. This requires targeted behavioural change interventions as having multiple sex partners is a sexual risk behaviour that may increase HIV transmission rate.

The non-disclosure of HIV sero-status constitutes a major barrier to HIV prevention and allow for more unsafe sex practices [27]. The participants' attitude toward sexual risk behaviours related to non-disclosure of HIV sero-status was positive. Over three-fifth of the participants disclosed their HIV sero-status to sex partners and knew the HIV sero-status of their sex partners. Majority of this disclosure happened immediately after testing positive for HIV. This is not consistent with report that only a minority of HIV infected pregnant women disclosed their HIV sero-status to their sex partners [11]. Non-disclosure of HIV sero-status is a sexual risk behaviour which is very important in this setting as study findings indicated a significant proportion of HIV discordant couples (46.1%). The study also showed that the chances are very high that sex partners will disclose their HIV sero-status if they know partners' HIV sero-status. Disclosure of HIV sero-status was associated with marital status; majority (over three-fifth) of married participants disclosed their HIV sero-status to their sex partners. This may flow from the expectations and commitments associated with the union of marriage. It may be anticipated that the

more the literacy level of the participants, the better they are informed of the importance of disclosure and the more the disclosures. This was not the case as the educational level of the participants did not affect the rate of HIV sero-status disclosure. However, participants who feel comfortable discussing their sex life with health workers are more likely to disclose HIV sero-status to their sex partners. There was no significant association between sex and disclosure of HIV sero-status. This is contrary to previous reports that male gender plays a major role in disclosure of status to sex partners better than female gender [27].

There is tendency that HIV infections could affect individual's sexual functions [1]. Majority of the participants reported decreased sexual urge or performance after commencement of antiretroviral therapy (ART) and about one-half never used drugs to enhance their sexual urge or performance. However, the use of drugs to improve sexual urge or performance was associated with older age. Low libido and erectile dysfunction are more commonly reported in HIV-infected men compared to men of negative or unknown status. Highly active antiretroviral therapy (HAART) has been reported to have association with a higher prevalence of lack of sexual desire [30,31]. Sexual dysfunction was found more often in men who were taking antiretroviral therapy compared to men who were not [32]. Collazos (2007) reported that the prevalence rates of sexual dysfunctions in the years since the advent of HAART vary, erectile dysfunction (9-74%), ejaculatory disturbances (36-42%) and low sexual desire (24-73%) [31]. There was no clear association between the use of antiretroviral drugs and sexual function was found among the women in previous study [32]. However, majority of female participants (over three-fifth) reported decreased sexual urge or performance unlike male participants that reported mostly increased sexual urge or performance. There was a significant association between participants' sex and sexual urge or performance in this study. It has been reported that ART paradoxically raises urge and sexual functions in sexually inactive HIV-infected adult patients due to direct influence in reducing emotional depression [10]. However, the use of antiretroviral therapy can reduce the risk of an HIV-infected person transmitting the infection to another by as much as 96% [21].

Although participants generally have positive attitudes on the necessity of condom usage during sexual intercourse, their practice regarding the consistent use of condom during sexual intercourse was poor. This is somewhat not consistent with reports of reduction in sexual risk behaviours among persons infected with HIV after initiating ART [12,15]. This is highly unacceptable as HIV-positive patients receiving ART have more regular contacts with health workers and are likely to be exposed to more prevention messages [15]. The consistent and correct use of condom is one of the major strategies of HIV prevention. This may be the result of poor knowledge of risk reduction associated with consistent and correct use of condom reported in this study. The propensity to use of condom during sexual intercourse was associated with marital status and the age of the participants unlike educational status. Majority of participants who used condom during sexual intercourse were married and aged >30 years old. Unsafe sex practices increase the risk of HIV transmission to discordant partners. The consistent use of condoms reduces the risk of getting or transmitting HIV by about 80% [6,22]. Interventions to improve uptake of condom during sexual intercourse is highly desirable as using both condoms and antiretroviral therapy reduces the risk of HIV acquisition from sexual exposure by 99.2% [6,23].

There were limitations to this study. The study did not cover the sexual risk behaviours of HIV positive patients who are not accessing ART for comparison. This may affect the generalization of the study findings to this category of patients. The study employed a cross-sectional study design which limited the monitoring of sexual risk behaviours of participants over time. This is important as changes in behaviour are not maintained in a substantial proportion of persons infected with HIV [25,26].

## Conclusion

The study findings showed poor knowledge of routes of HIV transmission and risk reduction associated with consistent and correct use of condom. The participants' attitudes toward sexual risk behaviours related to multiple sex partners, non-disclosure of HIV sero-status and some unsafe sex practices such as unprotected sexual intercourse was positive. The practice related to consistent use of condom during sexual intercourse was poor. The uptake of condom during sexual intercourse was not associated with educational status of participants. Few participants who were mostly single, separated, divorced or widowed; and also males, retirees and private sector employees had more than one sex partners. Majority disclosed HIV sero-status to their sex partners and knew HIV sero-status of their sex partners. Majority of female participants had decreased sexual urge or performance after starting ART unlike the males.

Following HIV pre-test counselling, all clients testing positive for HIV should be provided post-test and ongoing HIV counselling and education as an integral component of HIV prevention and mitigation strategies to improve knowledge of HIV and reinforce positive living.

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