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CORRELATES ASSOCIATED WITH ADHERENCE AMONG FEMALE SEX WORKERS ON HIV PRE- EXPOSURE PROPHYLAXIS IN NAIROBI CITY COUNTY, KENYA

Edith Amahwa Litiema, Professor Alloys S. Orago and Dr. Daniel
Muia



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^{1*} Edith Amahwa Litiema

¹Post Graduate Student: Kenyatta University

*Corresponding Author's E-mail: edithamahwa@gmail.com

² Professor Alloys S. Orago

Lecturer: Department of Medical Microbiology & Parasitology: Kenyatta University

² Dr. Daniel Muia

Lecturer: Department of Sociology: Kenyatta University

Abstract

Purpose: The main aim of the study was to assess correlates associated adherence among Female Sex Workers on PrEP in the study. This was done through determining level of knowledge on PrEP, level of adherence, correlates affecting adherence and analysis of strategies to enhancing PrEP adherence.

Materials and Methods: A cross sectional analytical study with mixed method using both qualitative and quantitative data collection method was carried out between March and May 2021. Three hundred and forty-five Female Sex Workers (FSWs) were enrolled in the study. Data was collected using structured questionnaire from study participants after having their consent. Three focus group discussions (FGD) were conducted for those FSWs who will not be involved in the quantitative arm of study. Key Informant Interview was conducted with service providers using Key informant interview (KII) guide. Data collected was entered into Excel spread sheet in password protect computer. Data analysis was carried out in, Univariate analysis, bivariate analysis and multivariate analysis. Statistical Package of Social Science (SPSS) version 20.0 was used for analysis. Data was presented using graphs and Tables.

Results: The study found that 72% did not know the name of PrEP, 39% reported to have missed PrEP with 33% having missed appointment for PrEP refill. Qualitative data showed that PrEP engagement meetings should be conducted monthly to enhance PrEP adherence. The respondents who had reminders on when to take medication was as well associated with adherence ($p=0.014$) compared with those not using reminders. The study also found out that employment status was associated with adherence to PrEP medication ($P=0.050$) with FSW who were salaried being 2.5 times more likely to adhere to PrEP medication compared to those who were not salaried.

Unique contribution to theory, practice and policy: The Ministry of Health should ensure that targeted PrEP counselling is done during the initiation for the eligible clients. The information and telecommunication department to work on SMS reminder system in order to remind FSWs using PrEP about appointment dates for the pill pick up thus enhance adherence to FSWs using PrEP. The procurement department should work together with pharmacy department to ensure that there is enough stock for PrEP at every clinic. This will help to ensure that adherence is achieved for the FSWs on PrEP.

Key words: *Correlates, Adherence, Female Sex Workers, PrEP*

1.0 INTRODUCTION

The rates of new HIV infections remain high, especially in Key populations in sub-Saharan Africa, these has created the need for new options for HIV prevention and treatment (Robyn, 2017). However, clinical studies imply that a program merging existing HIV prevention alternatives with oral pre-exposure prophylaxis and early antiretroviral treatment could make substantial impacts on lowering new infections in general and key populations (Robyn, 2017). The World Health Organization (WHO), and United Nations Programme on HIV/AIDS (UNAIDS) projected that by 2011, more than 780, 000 persons were infected with the virus in China, while about 154, 000 had AIDS. The Primary mode of transmission in China remains to be through sexual transmission (Li Ye, 2017).

Globally, over two million people are infected by HIV annually. Moreover, in 2015, more than 71, 000 individuals and approximately 6, 600 persons aged above 15 years and 0-14 years respected contracted the virus in Kenya. It suggested that over 77, 600 Kenyans would need lifelong antiretroviral management to control more HIV transmission and save their lives (NASCOP, 2016) Large research studies, including some done in Kenya show that PrEP reduces new HIV infections by more than 90% if taken daily (NASCOP, 2016). However, the effectiveness of PrEP is dependent on adherence, no infections occurred in PrEP users who were adherence to medication.

There are biological factors that aggravated the risk of young girls to infections which include inflammation, immaturity of genital mucus, (Ananda,2016) high viral load of the partner, or hormonal effects. Therefore, they need significant level of compliance to PrEP for sufficient efficacy. PrEP is a crucial strategy used in the control of HIV which is intended to be executed together with the use of condom, testing of HIV, and enhancement of management of HIV infection. Evidence based interventions on PrEP concludes that PrEP controls infection of HIV, hence minimizing the necessity for AIDS treatment in days to come and is cost effective. However, susceptibility of communities in these case FSWs are empowered to directly control their vulnerability of HIV infection, (Group, 2016). PrEP is a robust tool in the efforts towards preventing infections and can be used together with condoms and other control methods to offer ever higher protection as compared to when only a single method is used. In a study done by National Aids and STI Control Programme, (NASCOP 2016) concluded that persons who utilized the drug should be committed to take daily doses of PrEP and consulting their health care experts for follow-up of HIV test once in every ninety days. PrEP is the use of an antiretroviral drugs (ARVs) by people who are HIV negative to avert HIV infection. Clinical trials done have shown the efficacy of this drug (Florence, 2017) among men who have sex with men

Oral PrEP efficacy in HIV Prevention has been exhibited in clinical trials, the disclaimer is about the uptake and adherence and scale up in real- life healthcare setting. A feasibility study done in Kenya showed that characteristics of potential candidates for PrEP identified as those who alleged to be at danger of acquiring HIV, (Kiragu,2017) as well as barriers and motivators of adherence. PrEP refers to the utilization of medication that protects individuals who are uninfected with HIV from the threat of infection. Such persons have a significant risk of being infected with HIV. With sufficient antiretroviral medication concentration in the blood stream and tissues HIV is unable to establish infection.

Behavioural interventions include; safer sex choices/behaviours such as risk reduction counselling, sexual education, social marketing to promote effective condom use. Structural interventions promote an enabling environment by protecting the rights of people living with HIV; Gender based violence prevention and mitigation, stigma reduction and empowerment. Biomedical interventions entails treatment of STIs, post exposure prophylaxis, deliberate male therapeutic circumcision, treatment as prevention, PrEP, and reduction of harm for persons injecting drugs (NASCO, 2016). The encounter with PrEP in different communities and medical practice has increased (Fonner, 2016) so has the necessity to assess PrEP among all individuals who are highly susceptible to HIV.

The study will focus on the biomedical intervention, Pre Exposure prophylaxis among female sex workers, with more focus on adherence to the prescribed pills.

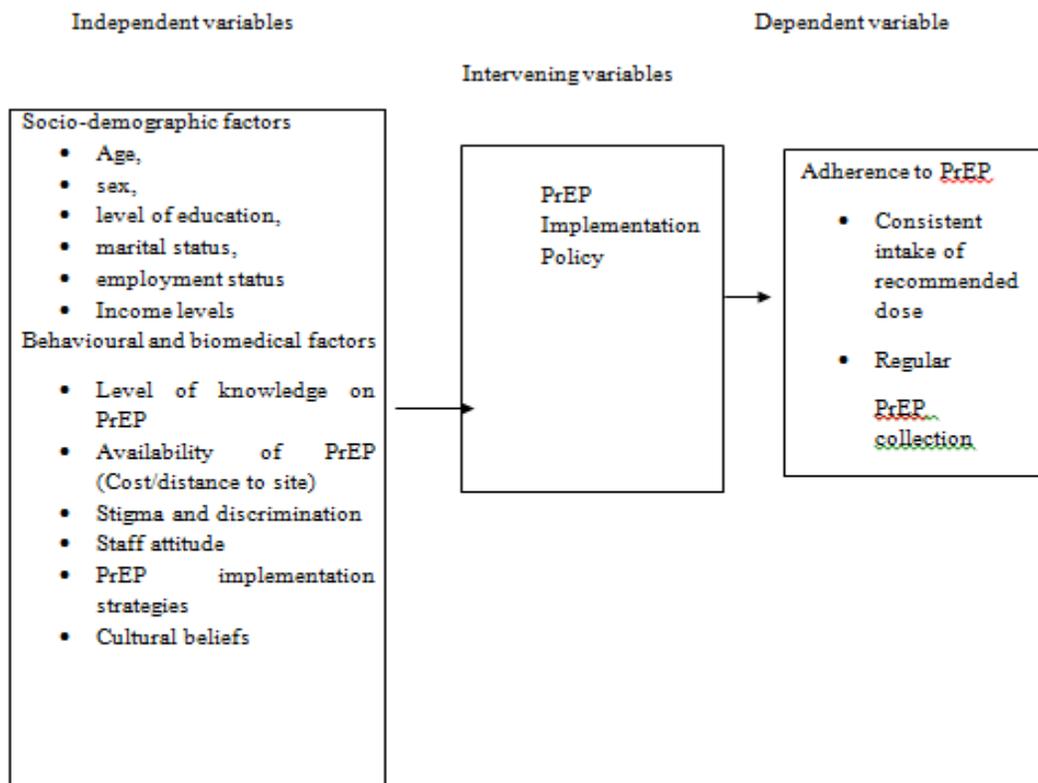
Problem statement

Females are largely at risk of being infected with HIV because of the complexity caused by biological, behavioural, and social factors. A study in the United States recorded that 80 % of new infections among women occurred from sexual transmission. It was identified that women lack authority over a wide range of prevention strategies which are intended to minimize sexual risk, for instance male circumcision, common monogamy, and regular use of condom. PrEP together with other combination strategies will provide necessary cover for FSW as it protects one from acquiring HIV before exposure.

For PrEP to be an effective protective method against contracting HIV among uninfected FSWs, adherence to its use must be perfect. However, correlates that affect adherence to PrEP have not been identified, described and strategies for enhancement determined. There are challenges on adherence to PrEP among Female sex workers. The purpose of this study was to identify the gaps associated with adherence to PrEP as an intervention of HIV prevention and address strategies to improve levels of adherence among FSWs.

Conceptual Framework

Conceptual framework is a tool which provides variational analysis linked to the research's goal. In this study the conceptual framework to be used is presented in Figure 1.



Source: Literature Review

Figure 1: Conceptual Framework

2.0 METHODOLOGY

A cross sectional analytical study with mixed method using both qualitative and quantitative data collection method was carried out between March and May 2021. Three hundred and forty-five Female Sex Workers (FSWs) were enrolled in the study. Data was collected using structured questionnaire from study participants after having their consent. Three focus group discussions (FGD) were conducted for those FSWs who will not be involved in the quantitative arm of study. Key Informant Interview was conducted with service providers using Key informant interview (KII) guide. Data collected was entered into Excel spread sheet in password protect computer. Data analysis was carried out in, Univariate analysis, bivariate analysis and multivariate analysis. Statistical Package of Social Science (SPSS) version 20.0 was used for analysis. Data was presented using graphs and Tables.

3.0 RESULTS

3.1 The socio-demographic characteristics of the study population

Table 1: Demographic Characteristics of Study Participants

| Characteristics | n | % |
|--|-----------|------|
| Level of Education | | |
| Primary and below | 128 | 37.1 |
| Secondary | 176 | 51 |
| Tertiary | 41 | 11.9 |
| Age | | |
| Below 24 | 47 | 15.6 |
| 24-29 | 85 | 24.6 |
| 30-39 | 152 | 44.7 |
| 40-49 | 54 | 15.7 |
| 50 yrs. and above | 7 | 2 |
| Age (Mean, SD) | 32.1(7.2) | |
| Marital status | | |
| Single (Never Married) | 242 | 70.2 |
| Ever married but currently not | 84 | 24.3 |
| Currently Married | 19 | 5.5 |
| Employment status (Occupation) | | |
| Self-employed | 174 | 50.4 |
| Unemployed | 151 | 43.8 |
| Employed (Salaried) | 20 | 5.8 |
| Average Monthly Income | | |
| 0-10000 | 70 | 35.2 |
| 10001-30000 | 100 | 50.3 |
| 30001-50000 | 21 | 10.6 |
| above 50000 | 8 | 4 |

Of the 345 HIV negative FSWs whose data were analysed, mean age was 32.1 with the youngest at 19 years and oldest at 57 years. About 63% had secondary education or above, 70% had never been married, and 56.2% were either self-employed or salaried. **Table 2** presents socio-demographic characteristics of the study participants

3.2 Knowledge on PrEP and Risk of HIV Acquisition

Table 2: Knowledge on usage of PrEP

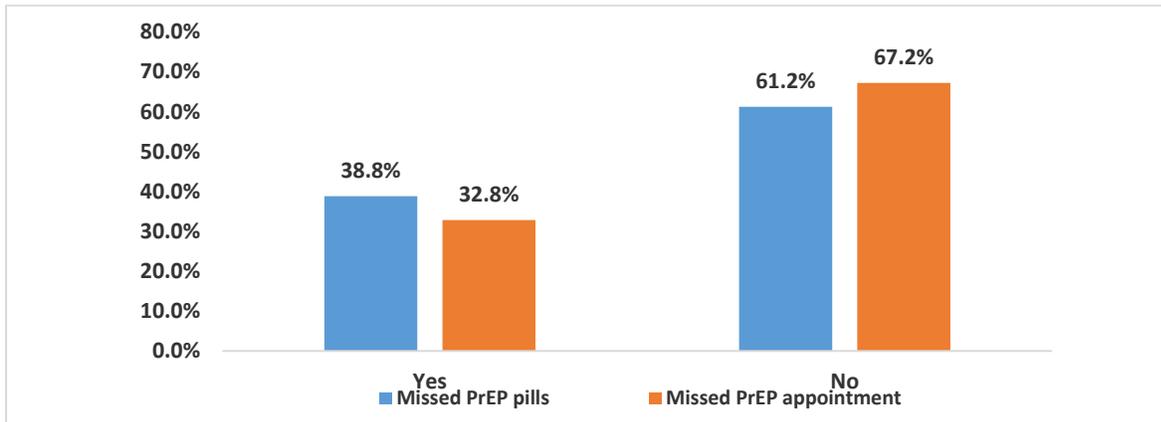
| Knowledge on PrEP | | |
|----------------------------------|-----|------|
| Name of PrEP | | |
| Truvada | 97 | 28.1 |
| Don't know (PrEP) | 248 | 71.9 |
| How often PrEP is taken | | |
| Once | 330 | 95.7 |
| More than once | 15 | 4.3 |
| PrEP pills taken in a Day | | |
| One pill | 345 | 100 |
| More than one pill | 0 | 0 |

The respondents were asked to indicate name of PrEP drugs they use. From **Table 2** majority of respondents (72%) did not know the name of the drug. They referred to it as PrEP and not

Truvada. When asked how often they take PrEP pill in a day, 95.7% reported that they take once a day. All respondents (100%) take one pill as stipulated in PrEP guidelines.

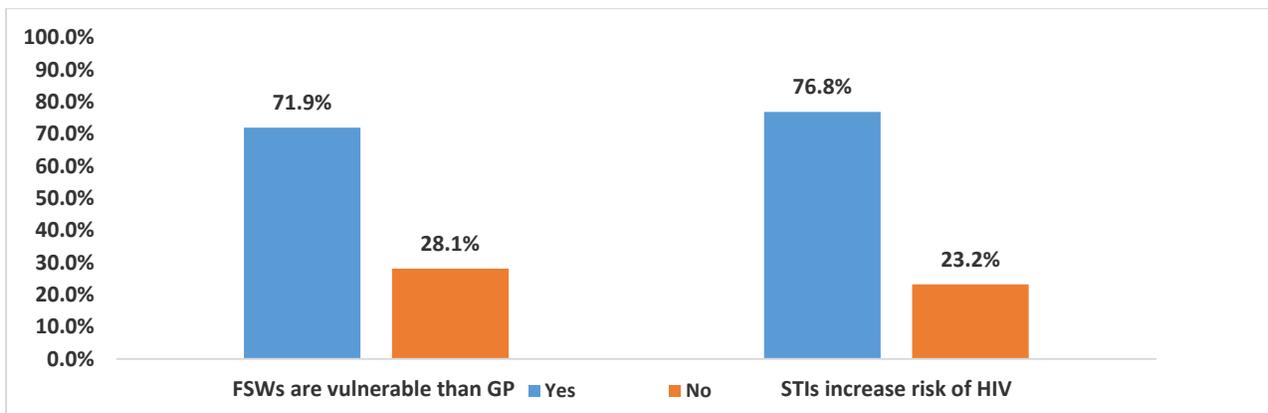
3.3 Adherence to PrEP

Figure 2: Adherence to PrEP pills and appointments



The study sought to establish adherence to PrEP. 39% (134/345) reported to have ever missed PrEP pills while 33% (113/345) had ever missed PrEP clinic appointment as illustrated in **Figure 2**.

Figure3: Risk of HIV Acquisition



The study sought to establish whether respondents understand risk of HIV acquisition PrEP is key in prevention. Respondents were asked whether FSWs are at higher risk of HIV acquisition compared to the general population 28% reported that FSWs are not at higher risk while 23% felt that STIs does not increase the risk of getting HIV as illustrated in **Figure 3**.

3.4 Correlates that influence adherence on PrEP among FSWs

Table 3: Factors associated with adherence to PrEP medication

| Characteristics | Total (n=345) | PrEP Adherence | | p value | UOR | 95% CI | |
|---------------------------------|---------------|----------------|-------------|---------|-------|--------|--------|
| | | No (n=211) | Yes (n=134) | | | Lower | Upper |
| Level of Education | | | | | | | |
| Primary and below ()** | 128(37.1)* | 83(39.3) | 45(33.6) | 0.222 | 1 | | |
| Secondary | 176(51.0) | 100(47.4) | 76(56.7) | | 1.402 | 0.876 | 2.242 |
| Tertiary | 41(11.9) | 28(13.3) | 13(9.7) | | 0.856 | 0.404 | 1.815 |
| Age (Mean, SD) | | | | | | | |
| | 32.1(7.2) | 31.7 (7.2) | 32.8(7.2) | 0.186 | 1.02 | 0.99 | 1.051 |
| Marital status | | | | | | | |
| Single (Never Married) () | 242(70.1) | 157(74.4) | 85(63.4) | 0.082 | 1 | | |
| Currently Married | 19(5.5) | 11(5.2) | 8(6.0) | | 1.343 | 0.52 | 3.467 |
| Ever married but currently not | 84(24.3) | 43(20.4) | 41(30.6) | | 1.761 | 1.065 | 2.911 |
| Employment status | | | | | | | |
| Unemployed () | 151(43.8) | 102(48.3) | 49(36.6) | 0.050 | 1 | | |
| Self-employed | 174(50.4) | 100(47.4) | 74(55.2) | | 1.54 | 1.00 | 2.426 |
| Employed (Salaried) | 20(5.8) | 9(4.3) | 11(8.2) | | 2.544 | 1.00 | 6.543 |
| Average Monthly Income | | | | | | | |
| 0-10000 () | 70(35.2) | 38(33.3) | 32(37.6) | 0.097 | 1 | | |
| 10001-30000 | 100(50.3) | 64(56.1) | 36(42.4) | | 0.668 | 0.358 | 1.245 |
| 30001-50000 | 21(10.6) | 10(8.8) | 11(12.9) | | 1.306 | 0.492 | 3.47 |
| above 50000 | 8(4.0) | 2(1.8) | 6(7.1) | | 3.562 | 0.672 | 18.886 |
| PrEP is effective | | | | | | | |
| 1 (Least effective) () | 27(8.0) | 21(10.0) | 6(4.6) | 0.278 | 1 | | |
| 2 | 10(2.9) | 7(3.3) | 3(2.3) | | 1.5 | 0.294 | 7.645 |
| 3 | 5(1.5) | 4(1.9) | 1(0.8) | | 0.875 | 0.082 | 9.376 |
| 4 | 66(19.5) | 42(20.1) | 24(18.5) | | 2 | 0.709 | 5.64 |
| 5 (Most Effective) | 231(68.1) | 135(64.6) | 96(73.8) | | 2.489 | 0.968 | 6.399 |
| How Often Take PrEP | | | | | | | |
| Once () | 330(95.7) | 202(95.7) | 128(95.5) | 0.925 | 1 | | |
| More than once | 15(4.3) | 9(4.3) | 6(4.5) | | 1.052 | 0.366 | 3.026 |
| Time You Take PrEP | | | | | | | |
| Before meals | 82(23.8) | 47(22.3) | 35(26.1) | 0.396 | 0.939 | 0.466 | 1.892 |
| After meals | 211(61.2) | 135(64.0) | 76(56.7) | | 0.71 | 0.384 | 1.313 |
| Any time ()** | 52(15.1) | 29(13.7) | 23(17.2) | | 1 | | |
| Reminder to Take PrEP | | | | | | | |
| No () | 86(24.9) | 43(20.4) | 43(32.1) | | 1 | | |
| Yes | 259(75.1) | 168(79.6) | 91(67.9) | 0.014 | 1.846 | 1.127 | 3.025 |
| Considering to stop PrEP | | | | | | | |
| No () | 289(83) | 192(91.0) | 97(72.4) | <0.001 | 1 | | |
| Yes | 56(16.2) | 19(9.0) | 37(27.6) | | 3.855 | 2.106 | 7.056 |

* Figures in parenthesis represent proportions of respondent expressed as percentages

** Reference category

Table 3 presents characteristics of FSWs by PrEP Adherence. Considering to stop taking PrEP was highly associated with PrEP Adherence ($p < 0.001$). FSWs who are considering to stop taking PrEP were almost four times more likely to adhere to PrEP medication [odds ratio (OR) 3.9 (95% confidence interval (CI) 2.10, 7.05)] compared to those not considering to stop taking PrEP.

Whether FSWs has a way of reminding herself to take PrEP medication was associated with adherence ($p=0.014$). Compared with those who were not using reminders, FSWs who were using reminders to take PrEP were 85% more likely to adhere to PrEP medication [OR 1.85 (95% CI 1.12, 3.02)]. Employment status of the FSWs was also found to be associated with adherence to PrEP medication ($p=0.050$). Salaried FSWs were 2.5 times more likely to adhere to PrEP medication compared to those who were not salaried [OR 2.544 (95% CI 1.00, 6.543)].

Other factors that had an effect on adherence to PrEP medication though not statistically significant included marital status ($p=0.082$), and monthly income ($p=0.097$). The odds of adhering to PrEP medication increased with level of income. FSWs earning more than KES 50,000 per month, were close to four times more likely to adhere to PrEP medication compared to those earning between KES 0 to 10,000.

3.5 Strategies to influence adherence to PrEP

Qualitative data was used to find out strategies to be implemented for PrEP adherence among FSWs, Where Focus group discussions were conducted among PrEP during monthly club meetings. In-depth interviews were conducted with twenty FSWs among those adhering to PrEP always, coming for refills, there were FSWs who ever missed appointments for PrEP refills and those who discontinued PrEP.

The socio demographic characteristics of participants were similar to those interviewed quantitatively

The study identified four main strategies that if implemented will help in mitigation towards barriers of adherence to PrEP. These were categorized as presented in the table below:

| Strategy | Rating |
|--|--------|
| Education to decrease stigma with Fsws on PrEP | 4 |
| Education on how PrEP works | 4 |
| Lifestyle modification | 3 |
| Research on new PrEP products | 4 |

The study participants were asked to rate on the identified strategies and it was realized that FSWs on PrEP were experiencing stigma as it was perceived by the peers that a person using PrEP is likely to be HIV positive hence causing a barrier to adherence to PrEP. There is the major role developing clear education and messaging to convey PrEP concept and intervention integration into supportive and individualized services.

It was identified that lifestyle factors such a substance use can affect adherence to PrEP. The participants stated that sometimes after taking alcohol, they did not remember to take their pill on time and some reported not taking them altogether.

The participants cited that they were inconvenienced on the fact that PrEP pill is to be taken daily which was a burden to PrEP user. However, they preferred if possible to have a pill on monthly basis as opposed to daily as this will be less burden and easier to comply hence yielding to PrEP effectiveness.

Themes emerged and were summarized, themes and quotes that recurred were obtained and are in the report. The following themes were captured

Participants missed to take their doses when they were away from home as they had not disclosed to anyone at home about the pills. Some had gone for a tour with the customer but overstayed the days she expected to take her pills as she had carried for few days.

“Sometimes I take few pills when leaving home, but when I get a client who decides we travel away from town then my pills run out so I miss taking PrEP for few days.... I forget to take PrEP when my friends are with me or when I am stuck in traffic and arrive late at home.” FSW-003

Participant opined that more pills should be dispensed in the case where one was to travel. This will mitigate one from missing from taking their pills hence achieve good adherence.

However, participants had views that if the healthcare providers could offer more explanation and reassurance about expected side effects, then it could have made them to continue taking PrEP. Some participants lacked nutritional advice from the health care staff as they were concerned with their increase in weight.

Participants proposed various ways to improve on adherence despite the side effects, one of the participants who had taken PrEP for over one year but had stopped said that *“there should be a way to communicate to the health worker at the facility through phone call, or SMS instead of having to come to the clinic to explain side effects*

Other participant said that it could be good to have support group meetings at least monthly to address the challenges to PrEP. Through the support groups the myths and misconceptions about PrEP would be addressed and challenges shared hence improve on adherence.

The study realized that strategies to enhance adherence to PrEP were categorized at three levels, to include individual whereby PrEP education and motivation to maintain good health. At social level PrEP adherence is good when there is peer and partner support. The presence of empowered outreach team of health care workers who offer proper counselling on PrEP and upholding FSWs confidentiality. These strategies if well implemented will improve on adherence hence achieve the effectiveness of PrEP, and contribute to efforts aiming to control the HIV/AIDS epidemic.

4.0 SUMMARY AND RECOMMENDATIONS

Summary

To determine the level of knowledge on PrEP among study participants

From the study the results indicated that majority of the respondents (72%) were taking PrEP but did not know the name. They referred to it as PrEP and not Truvada. The respondents were informed that PrEP is taken once a day. (95.7%). The response on whether the FSWs were at a higher risk of HIV acquisition compared to the general population showed that they were informed of how PrEP was a preventive strategy for them not to be infected by the HIV virus when having monetary sex.

To establish level of adherence on PrEP among FSW in the study

The study main objective was to establish adherence level of the FSW on PrEP. For PrEP to be effective, adherence and commitment on taking the pill daily is Key. This was done by inquiring whether the respondent had missed taking PrEP or whether they did not keep appointment for PrEP refill. 39% of the respondent reported to have ever missed PrEP pills while 33% reported to

have missed clinic appointments for PrEP refill. This indicates that there are challenges of adherence to PrEP hence compromising on its effectiveness. These findings agree with other study done among

To determine correlates that affect adherence on PrEP among FSW in the study

The study sought to determine correlates that influence adherence on PrEP among FSW in the study. Various characteristics were considered to influence adherence, FSW considering to stop taking PrEP was highly associated with PrEP adherence. ($p < 0.001$). The respondents who had reminders on when to take medication was as well associated with adherence ($p = 0.014$) compared with those not using reminders. The study researched on the employment status of the FSWs. This was also found to be associated with adherence to PrEP medication ($P = 0.050$) with FSW who were salaried being 2.5 times more likely to adhere to PrEP medication compared to those who were not salaried.

To analyse the strategies enhancing adherence to PrEP among FSW in the study

Prep adherence strategies should be developed and designed a holistic approach, acknowledging the contextual factors of FSWs. Targeted intervention to include socio-cultural, economic, and individual preferences have the potential has the potential to assure the highest level of adherence. The study looked at various strategies that if implemented could enhance adherence to PrEP. This was analysed through response from the qualitative arm of the study. It was emphasized that targeted counselling services during assessment and initiation of PrEP would make FSW to adhere to PrEP. FSW opined that sending of messages to remind them on appointment date for PrEP refill would make them not miss their pills. It was also important to have monthly PrEP engagement meetings. This will enable FSWs to be empowered on PrEP taking as they share their challenges hence impact on adherence to PrEP.

Recommendations

The Ministry of Health should ensure that targeted PrEP counselling is done during the initiation for the eligible clients and it is evidence that PrEP is an intervention used among FSWs and it can work in prevention of HIV, however, adherence is key to PrEP for it to be effective. The information and telecommunication department to work on SMS reminder system in order to remind FSWs using PrEP about appointment dates for the pill pick up thus enhance adherence to FSWs using PrEP. The study findings showed that adherence can be compromised when there is less PrEP at the drop in centres. The procurement department should work together with pharmacy department to ensure that there is enough stock for PrEP at every clinic. This will help to ensure that adherence is achieved for the FSWs on PrEP.

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