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Assessment of Awareness, Willingness, and Practice of Human Immunodeficiency Virus Pre-Exposure Prophylaxis Among Female Sex Workers in Uyo, Akwa Ibom, Nigeria

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Abstract

This study investigated the awareness, willingness, and practice of HIV Pre-Exposure Prophylaxis (PrEP) among female sex workers (FSWs) in Uyo, Akwa Ibom State, Nigeria. Conducted between June and August 2020, the cross-sectional research engaged 344 HIV-negative FSWs attending services at Uyo's One-Stop Shop for key populations services. Through a semi-structured questionnaire, data were collected on awareness, willingness, and practice of PrEP, and subsequently analyzed using statistical methods. The study's participants had a mean age of 29.06±5.20 years, with 68.6% falling between 25-34 years old. Notably, 76.5% were adequately aware of PrEP, while 8.1% expressed willingness to use it, and 42.4% had practiced PrEP. Factors like age, marital status, and years engaged in sex work were found to significantly influence awareness of PrEP. Participants aged 25-34 years, those previously married, and those with fewer years in sex work exhibited greater PrEP awareness. The frequency of first-time and boyfriend clients per week impacted willingness and practice of PrEP, with the former positively influencing willingness and the latter negatively affecting practice. Engaging in unprotected sex was also found to negatively correlate with PrEP practice. These findings highlight that while awareness of PrEP is relatively high among FSWs, willingness to use and actual practice of PrEP remain low. The study underscores the importance of tailored health education programs targeting FSWs, to enhance awareness and encourage adoption of effective HIV preventive measures. By addressing factors like age, marital status, and specific aspects of sex work, interventions could be designed to increase PrEP utilization, thereby contributing to the reduction of HIV transmission in this population.

Keywords*: Female sex workers, HIV, Key Populations, One Stop Shop, Pre-exposure prophylaxis, Uyo.*

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Introduction

Human Immunodeficiency Virus (HIV) epidemiology is disproportionately higher among various populations especially among the key populations compared to the general population. The proportion of new adult HIV infections among key populations (sex workers and their clients, gay men and other men who have sex with men, people who inject drugs, transgender people) and their sexual partners was about 70% globally and 51% in sub-Saharan Africain in 2021 [1]. Several factors have been reported to fuel HIV across different populations and regions. Controlling and preventing HIV infection programs must be based on an intervention that works and based on need with focus on key populations and driver of the HIV epidemic. HIV interventions that address the specific needs of key populations are vital to prevention efforts as countries work towards achieving both generalized and concentrated epidemic control.

Female sex workers (FSWs) are among the key populations with higher vulnerability to HIV infection, with an estimated 11.8% prevalence globally higher than the general population [2, 3]. Similarly, the rates of HIV among FSWs are estimated to be 30 times higher than that of the general population, especially among (women population) especially in low- and middle-income countries [1, 4]. A disproportionate burden of HIV infection is concentrated in sub-Saharan Africa, where an estimated 29.3% of sex workers are living with HIV with a prevalence of HIV infection among them estimated to be 26 times higher than that of the general population [5].

Data evidence indicated that about 80% of new HIV infections in Nigeria were reported to be due to unprotected heterosexual sex, with the majority of this occurring in key affected populations, including FSWs who account for about 39% of the new HIV infections in Nigeria, which could be due to only about 23% consistent condom use [5, 6, 7].

Generally, there is evidence that sex work is often anchored in poverty, victimization, gender-power imbalances, and lack of opportunities for those involved [6, 8, 9]. The high HIV prevalence among FSWs can be attributed to several factors beyond their control. Some of those factors include the inability of FWS to negotiate consistent condom use with their clients, occasional condom bursts during sex with partners with unknown HIV status, getting used to certain clients leading to false trust and confidence accepting unsafe sex as safe sex, and gender-based violence associated with FSW trade [3, 9, 10, 11].

Implementing strategies and Interventions that prevent HIV infection among the FSWs who a vulnerable sub-population are will protect them and in turn reduce HIV transmission among the general population [12]. For example, firstly, behavioral interventions such as the appropriate and consistent use of male or female condoms have been shown to reduce HIV transmission and decline HIV incidence rates across the world [13, 14, 15 16]. However, concerns have been raised that, sometimes condoms may not be used for several reasons, such as in rape cases, personal choice, or condom breakage [17, 18, 19]. In such situations, the probability of HIV transmission may be reduced if the FSW is on PrEP. The use of PrEP among FSW would be a game changer as they can control its use by taking it before they have contact with their clients. Several studies have reported that FSWs who had a condom burst or been engaged in unprotected sexual exposure with clients with unknown HIV status didn't use post-exposure prophylaxis (PEP) and were not on PrEP to prevent HIV infection [17, 18, 19].

This shows that there is a gap in awareness, willingness, and practice of PrEP among this subgroup of the population. Literature evidence is rare on the awareness, willingness, and practice of PrEP among FSWs in Nigeria probability because the PrEP initiative was recently scaled up as one of the HIV prevention

interventions. Secondly, One-stop shop (OSS) is a community-based Antiretroviral Therapy (ART) clinic model to improve HIV Prevention and Treatment cascade for Key Populations (KPs). OSS provides integrated services for HIV Testing and Services (HTS), STI treatment, clinical referrals, and ART to KPs living with HIV/AIDS under one roof while protecting their privacy, which is effective in reducing barriers to retention and adherence [20].

Therefore, it is justifiable to assess the awareness, willingness, and practice of PrEP use among this high-risk group about two years after the introduction of PrEP. The objective of this study was to determine the awareness, willingness, and practice of PrEP among FSWs in Uyo, Akwa Ibom state. The results from this study are expected to guide policymakers in the development of health education tools to strengthen FSWs' education to improve their awareness of PrEP and guide them on the use/misuse that may result in HIV drug resistance. The findings will also be useful to HIV/AIDS funders and implementing partners in ensuring a KP-sensitive approach to PrEP implementation, thereby contributing to HIV epidemic control.

Method

Study Sites, Study Design, and Study Populations

Study Site

The study took place at Uyo OSS in Akwa Ibom state, Nigeria. The OSS provides PrEP to FSWs and other KPs as a core component of a comprehensive HIV/Sexually transmitted diseases (STI) care and prevention package. As part of primary prevention intervention, the clients are counseled to use protection while having sexual exposure. To balance counseling with practice the program provides condoms to the clients. Occasionally, the clients have accidental unsafe sexual exposure due to drunkenness, rape or condom burst, or other reasons. In such circumstances, they are given Post-Exposure Prophylaxis (PEP) as a preventive measure.

Study Design

The study was a cross-sectional survey carried out among HIV-uninfected FSWs who received health promotion and prevention services at the One Stop Shop (OSS) in Uyo, Akwa Ibom state, South-South Nigeria between June and August 2020 (n = 344).

Study Population

The study participants consisted of all HIV-uninfected FSWs who received health promotion and prevention services at the One Stop Shop (OSS) in Uyo, Akwa Ibom state, South-South Nigeria between June 2020, and August 2020.

Inclusion and Exclusion Criteria

Inclusion Criteria

The criteria for inclusion of participants were:

1. Participants must be female sex worker who uses the ART services of the Uyo OSS, confirmed HIV-negative.
2. Participants are 18 years of age and older at the time of recruitment in the study.

Exclusion Criteria

The exclusion criteria were those who were non-female sex workers, not using the ART services of the Uyo OSS, were HIV-positive, and were less than 18 years of age, and did not consent to participate were excluded.

Sample Size Determination

Determination of the sample size for the study was done using the formula by [21].

Specifically, the formula is:

$$n = \frac{Z^{2*}pq}{d^2}$$

n= desired sample size.

Z = the value of the normal deviation corresponding to the 95% confidence interval (1.96).

p=the proportion in the target population estimated to have characteristics being measured; we adopted 72% knowledge.

d= the error margin tolerated at 95% degree of confidence =0.05.

This means:

$$n = \frac{(1.96)^2(0.72)(0.28)}{(0.05)^2}$$

$$n = \frac{3841 \times 0.2016}{0.025}$$

$$n = \frac{0.769}{0.025}$$

n = 310.

The minimum sample size was 310. However, the sample size was adjusted for an estimated 15% number of participants to account for the attrition rate; considering the challenges of discrimination and police harassment of the population studied that makes them scared always and highly mobile n =357.

Ethical Considerations and Consent

Ethical clearance for this study was obtained from the Akwa Ibom State Ministry of Health Research Ethics Committee with approval number AKHREC/19/7/21/034. Subsequently, individual participants' informed consent was also obtained to ensure that the study participant acknowledged understanding of the research study aims and objectives and understood that they can withdraw at any time with any negative consequence concerning the ART health promotion and other services at the OSS facility.

Sampling Method

The selection of the study sample was done through multistage sampling. Firstly, systematic random sampling procedure. This was followed by a simple random sampling technique that involved the assignment of sampling units from the target population (female sex workers) with an equal and known nonzero probability of being selected. We used this sampling technique to ensure that female sex workers visiting Uyo OSS were independent of previous sampling units which will eliminate systematic bias from the selection procedure.

Interview Process and Procedures

Those who met the inclusion criteria and consented to participate in the study were interviewed in a private room. During the interview, we explained the details of the study, including potential risks and benefits of participation. Contact details were provided in case participants had further questions or comments relating to the research study.

Data Collection Instrument

The instrument used for this research study was a semi-structured researcher-administered questionnaire to collect quantitative data. The instrument sought demographic variables of the participants, knowledge of, willingness to use, and practice PrEP. Pre-testing of the questionnaire was done on 36 FSWs (10% of the study sample) in an OSS in Eket, Akwa Ibom state. The pre-tested data were collected before actual data collection to ascertain homogeneity and clarity of the questions and data collection procedure. The questions in the questionnaire that were clear to the pilot participants were rephrased. The pre-tested data and information were not included in the study's final data analysis. An informed consent form was attached to the questionnaire which was given to the study participants. Those who qualified and consented to participate in the study were interviewed in a private room. During the interview, details of the study were explained, including potential risks and benefits of participation. Contact details were provided in case participants had further questions or comments relating to the research study.

The first three sections of the questionnaire consisted of twelve (12) single-response questions about the socio-demographic information and sexual orientation of respondents. The study participants were asked to choose a response to questions on age, marital status, level of education, religion, duration of

Sex work, average clients load, boyfriend relationships, condom use and involvement in anal and oral sex, which were used to develop a profile on the respondents to establish independent variables for the study. The second three sections of the questionnaire consisted of single-response questions about awareness, willingness, and practice of HIV PrEP. Respondents were asked to respond to questions on the effectiveness of PrEP as a preventive measure against HIV transmission to determine willingness to use PrEP; the respondents' overall awareness score on PrEP practice to identify self-assessment score on PEP awareness as an impact on PrEP practice; and their view on the use and willingness to recommend PrEP to prevent HIV acquisition to ascertain the willingness and practice of HIV PrEP. Find attached a copy of questionaries.

PrEP Awareness and Classification

Awareness score on PrEP was assessed using the knowledge variables with a score of 1 assigned to each correctly answered ranking done based on the total scores of respondents. The total score was generated, and the percentage score was categorized as; <50% - Not Satisfactory (No correct answer or 1 correct answer out of the 3 questions), 50 to <75% - Fair (2 correct answers out of the 3 questions), 75 to 100% - Satisfactory (3 correct answers out of the 3 questions). A respondent scoring 75% or more was considered to have adequate awareness of PrEP.

Willingness to Use PrEP Data Collection and Classification

Willingness to use PrEP questions were not structured using the Likert scale for response; instead, the responses were structured using binary response i.e. 'Yes' or 'No'. When the respondent gave a correct response to questions, s/he scored 1 point as shown in this section. The total score was generated and computed as a percentage score.

The percentage score was categorized as; <50% - Not Satisfactory, 50 to <75% - Fair, 75 to 100% - Satisfactory. A respondent scoring 75% or more was considered to have an appropriate willingness to use PrEP.

The Practice of PrEP Data Collection and Classification

The practice of PrEP was assessed using the practice variables with a similar score and ranking based on the total scores of respondents. The total score was generated while the percentage score was categorized as; The total score was generated and the percentage score was categorized as; <50% - Not Satisfactory (No correct answer or 1 correct answer out of the 3 questions), 50 to <75% - Fair (2 correct answers out of the 3 questions), 75 to 100% - Satisfactory (3 correct answers out of the 3 questions). A respondent scoring 75% or more was considered to have good PrEP practice.

Data Management and Confidentiality

Data collected were extracted from the questionnaire, coded, and entered Microsoft Excel 2016, reviewed, and cleaned to ensure the correctness and completeness of all variables collected.

To ensure confidentiality of participant information, all data collected were de-identified and only serial numbers and coded numbers were used for data collection. Hard copies of data collected were locked in a cupboard and soft copies of excel file were saved in a passworded computer and access was s restricted to research team members only.

The cleaned and verified excel file was exported into the Statistical Package for Social Sciences (SPSS) version 20.0 for data analysis. All categorical and ordinal data were presented in the form of frequencies, and percentages, while the age of the participants was summarized as means, and standard deviation, median, and Interquartile range for the descriptive analysis.

For the Inferential Statistics, multivariable logistic regression analysis was employed to explore the association between PrEP and independent variables of interest at a probability of 5% level of significance and 95% confidence interval for all variables.

Results

Of a total of 357 participants interviewed, all participants consented and participated in the study with a 100% response rate. However, following data review and checking for correctness, completeness, and consistency of data, a few responses with incomplete data were removed. Therefore, only 344 (96.4%) responses were included in the data analysis.

Socio-Demographic Characteristics of Study Participants in OSS Uyo, Akwa Ibom

Socio-demographic characteristics of the respondents summarize participants age, marital status, religion, educational status, and years in the practice of sex work. The mean age was 29.06 ± 5.20 with about a third (37.2%) of the respondents being within the age range of 25-29. The majority (88.7%) of the respondents had never been married and there was a comparable number of FSWs with twelve years of secondary, more than one-third (40.1%) and over twelve years of post-secondary (41.9%) education. About three-quarters of the respondents (74.4%) had practiced sex work for 5 years or less. (Table 1).

Table 1. Socio-Demographic Characteristics of Study Participants in OSS Uyo, Akwa Ibom

Variables	**n= 344**	**(%)**
Age of Respondents		
Age Mean ± SD 29.06 (5.20) Range 18-42 years	-	-
<25 years	63	18.3
25 - 29 years	128	37.2
30 - 34 years	108	31.4
>34 years	45	13.1
Marital Status		
Never Married	305	88.7
Ever Married	39	11.3
Educational Status		
No Secondary Education	62	18
Secondary Education	138	40.1
Post-Secondary Education	144	41.9
Years in Sex Work		
≤5years	256	74.4
>5years	88	25.6

Awareness, Willingness, and Practice of Pre-Exposure Prophylaxis in OSS Uyo, Akwa Ibom

A high proportion (76.5%) of the respondents had adequate awareness of PrEP while a small proportion of less than one-tenth (8.1%) of the respondents had an appropriate willingness to use PrEP. Common factors reported by respondents that may affect the use of PrEP were condom usage (93.3%), lack of knowledge about PrEP (88.7%), fear of side effects from the drugs (81.4%), and traditional beliefs associated with HIV infection (13.7%). Less than half (42.4%) of the FSWs reported that they had ever used PrEP (Table 2). The most common reasons

reported for previous use of PrEP were that clients did not want to use a condom (43.5%), clients paid more not to use a condom (26.5%) and respondent decided not to use a condom (21.8%) (Table 2).

Table 2. Awareness, Willingness, and Practice of Pre-Exposure Prophylaxis in OSS Uyo, Akwa Ibom

Variables	**n= 344**	**(%)**
PrEP Awareness		
Adequate	263	76.5
Inadequate	81	23.5
Willingness to use PrEP		
Appropriate	28	8.1
Inappropriate	316	91.9
Practice of PrEP		
Yes	146	42.4
No	198	57.6

Association between Awareness of PrEP and Demographic Characteristics in OSS Uyo, Akwa Ibom

Analysis of the factors contributing to the awareness of PrEP among FSW in association with socio-demographic characteristics of respondents associated with adequate awareness of PrEP. Three factors namely age, marital status, and years in sex work were significantly associated with adequate awareness of PrEP among the study respondents. This means that FSWs in the age range <25 – 34 years are more adequately aware of PrEP than those >34 years of age. Participants who had never been married were three times more aware of PrEP compared to those who had ever married. FSWs who have had ≤5 years in sex work were 2.62 times statistically significantly more aware of PrEP compared to those who had > 5 years in sex work (Table 3).

Table 3. Association between Awareness of PrEP and Demographic Characteristics in OSS Uyo, Akwa Ibom

95% CI				
Variables	**Odd Ratio**	**Lower**	**Upper**	**p-value**
<25	8.10	2.40	27.33	**0.001**
25 – 29	5.44	1.79	16.54	**0.003**
30 – 34	3.02	1.05	8.69	**0.041**
>34	1	Ref	-	-
Marital Status				
Never Married	3.10	1.27	7.58	**0.013**
Ever Married	1	Ref	-	-
Educational Status				
No Secondary Education	0.79	0.38	1.63	0.523
Secondary Education	0.82	0.46	1.48	0.515
Post-Secondary Education	1	Ref	-	-
Duration of Sex Work				
≤5years	2.62	1.39	4.92	**0.003**
>5years	1	Ref	-	-

Adjusted for Age, Marital Status, Level of Education and Duration of Sex Work

Association between Awareness of PrEP and Selected Variables

FSWs who are aware of Post-Exposure Prophylaxis (PEP) were one time more adequately statistically significantly aware of PrEP than those not aware of PEP. There was no statistical association with the other variables (Table 4).

Table 4. Relationship between Awareness of PrEP and Selected Variables in OSS Uyo, Akwa Ibom

95% CI				
Variables	**Odd Ratio**	**Lower**	**Upper**	**P-value**
Weekly Client Load				
0 - 11 Clients	0.98	0.41	2.33	0.959
>11 Clients	1	Ref		
Number of First-Time Clients per Week				
0 - 7 Clients	1.25	0.62	2.52	0.530
>7 Clients	1	Ref		
Number of Boy Friend Clients per Week				
0 - 1 Client	1.30	0.69	2.45	0.412
>1 Client	1	Ref		
Condom Use				
Use	1.09	0.42	2.81	0.856
Non-Use	1	Ref		
Engages in unprotected sex when given some incentives				
Yes	1.15	0.69	1.91	0.598
No	1	Ref		
Awareness of PEP				
Adequate	1.36	0.68	2.73	**0.011**
Inadequate	1	Ref		

Adjusted for Oral Sex new clients, Anal Sex new clients, Oral Sex old clients, Anal Sex old clients, Oral Sex boyfriend and Anal Sex boyfriend, Client Load, Condom Use, Engaging in Unprotected Sex, and Overall, Knowledge score on PrEP

Association between Willingness to use PrEP and Socio-Demographic Characteristics

We found that none of the five socio-demographic characteristics of the respondents analyzed were statistically associated with the willingness to use PrEP if it was offered to them. (Table 5).

Table 5. Relationship Between Willingness to use PrEP and Socio-Demographic Characteristics in OSS Uyo, Akwa Ibom

95% CI				
Variables	**Odd Ratio**	**Lower**	**Upper**	**P-value**
Age				
<25	1.24	0.30	5.17	0.768
25 – 29	2.63	0.68	10.18	0.161
30 – 34	1.57	0.48	5.17	0.457

>34	1	Ref		
Marital Status				
Never Married	0.65	0.20	2.04	0.454
Ever Married	1	Ref		
Level of Education				
No Secondary Education	5.10	0.64	40.42	0.123
Secondary Education	0.68	0.30	1.56	0.366
Post-Secondary Education	1	Ref		
Duration of Sex Work				
≤5years	0.77	0.28	2.09	0.606
>5years	1	Ref		

Association between Willingness to use PrEP and Selected Variables in OSS Uyo, Akwa Ibom

When willingness to use PrEP was compared with factors associated with sex work, three of them - weekly client load, number of first-time clients per week and condom use were significantly associated with willingness to use PrEP). Further, respondents with a weekly client load of 0-11 clients were <1 time less willing to use PrEP if it was offered compared to those with >11 Clients Similarly, a respondent that sees 0-11 clients weekly was <1 time less likely to use PrEP compared to one with >11 Clients. However, those who see 0-7 first-time clients per week were four times more likely to be willing to use PrEP compared to those who see more than 7 first-time clients per week). An FSW who used of condom during sex was one time less likely to use PrEP as compared to those not using a condom during sex (Table 6).

Relationship between Practice of PrEP and Socio-Demographic Characteristics in OSS Uyo, Akwa Ibom

None of the socio-demographic characteristics of the respondents was associated with the practice of PrEP Table 7.

Table 6. Relationship between Willingness to use PrEP and selected Variables in OSS Uyo, Akwa Ibom

95% CI				
Variables	**Odd Ratio**	**Lower**	**Upper**	**P-value**
Client Load				
0 - 11 Clients	0.13	0.03	0.56	**0.007**
>11 Clients	1	Ref		
Number of First-Time Clients per Week				
0 - 7 Clients	3.53	1.05	11.82	**0.041**
>7 Clients	1	Ref		
Number of Boy Friend Clients per Week				
0 - 1 Client	2.46	0.75	8.08	0.138
>1 Client	1	Ref		
Condom Use				
Use	0.75	0.60	5.13	**0.005**
Non-Use	1	Ref		
Engages in unprotected sex when given some incentives				
Yes	1.61	0.70	3.67	0.263

No	1	Ref		
Overall knowledge score on PEP				
Adequate	2.25	0.89	5.60	0.519
Inadequate	1	Ref		

Adjusted for Weekly Client Load, Weekly New Client Load, Weekly Old Client Load, Weekly Boyfriend Client Load, Condom Use, Engaging in Unprotected Sex, Overall knowledge score on PEP and Overall, Knowledge score on PrEP

Table 7. Relationship between Practice of PrEP and Socio-Demographic Characteristics in OSS Uyo, Akwa Ibom

95% CI				
Variables	**Odd Ratio**	**Lower**	**Upper**	**P-value**
<25	1.46	0.58	3.67	0.425
25 – 29	1.08	0.48	2.43	0.851
30 – 34	0.92	0.42	2.01	0.827
>34	1	Ref		
Marital Status				
Never Married	1.16	0.54	2.51	0.706
Ever Married	1	Ref		
Level of Education				
No Secondary Education	0.72	0.39	1.32	0.284
Secondary Education	0.81	0.50	1.33	0.410
Post-Secondary Education	1	Ref		
Duration of Sex Work				
≤5years	1.58	0.90	2.77	0.111
>5years	1	Ref		

Relationship between Practice of Pre-Exposure Prophylaxis and Selected Variables in OSS Uyo, Akwa Ibom

Adjusting for other factors, the number of boyfriend clients per week and engaging in unprotected sex were significantly associated with the practice of PrEP among the study respondents as shown in Table 8 below.

Table 8. Relationship between Practice of PrEP and selected Variables in OSS Uyo, Akwa Ibom

95% CI				
Variables	**Odd Ratio**	**Lower**	**Upper**	**P-value**
Weekly Client Load				
0 - 11 Clients	1.18	0.53	2.61	0.690
>11 Clients	1	Ref	-	-
Number of First-Time Clients per Week				
0 - 7 Clients	0.66	0.34	1.26	0.205
>7 Clients	1	Ref	-	-
Number of Boy Friend Clients per Week				
0 - 1 Client	1.93	1.06	3.52	**0.032**

>1 Client	1	Ref	-	-
Condom Use				
Use	1.38	0.75	2.54	0.302
Non-Use	1	Ref		
Engages in unprotected sex when given some incentives				
Yes	0.56	0.36	0.87	**0.010**
No	1	Ref		

Adjusted for Weekly Client Load, Number of First Time Clients per Week, Weekly Boyfriend Client Load, Condom Use and Engagement in Unprotected Sex

A respondent who sees 0-1 Boyfriend client per week was two times more significantly to practice PrEP as compared to that with >11 clients. FSWs who engage in unprotected sex when given incentives was one time less likely to practice PrEP compared to those who did not engage in unprotected sex. There was significant difference among FSW acceptance of sex without use of condom compared to those who practice PrEP.

Discussion

This study revealed that the majority (76.5%) of the study respondents were aware of PrEP as an HIV biomedical prevention intervention and strategies tool. There was statistically significant association of respondents' awareness on PrEP in association to variables such as age, marital status, and years of sex work. About half of the FSWs reported they had practiced PrEP. Factors affecting the use of PrEP include lack of PrEP knowledge, presumed side effects of PrEP, lack of time to visit the facility for PrEP, and availability and usage of condom.

The finding of high proportion (76.5%) PrEP awareness by the respondents varied with the reports by [22], and [23] who reported PrEP awareness of 21% and 36.4% respectively. Additionally, a new most recent study by [24] also reported lower 32.7% PrEP awareness among FSWs. Additionally, two other independent studies reported similar proportion of willingness to use PrEP; [22] reported 74% and [24] reported acceptability of 80.2%. However, similar high proportion (95.2%) PrEP awareness have been documented [25] among men who have sex with men and female sex workers in Nigeria. On the contrary, [26] reported low knowledge of PrEP (10.9%) among similar study participants. Some of the variation between studies could be attributed to several factors such as the selected participants and the types of FSWs (brothel- versus street-based) targeted in those studies. Regardless, those studies largely consistent with existing knowledge about FSWs and HIV transmission in developing countries like Nigeria.

Further analysis of respondent in association with age showed that PrEP awareness was significantly higher among FSWs in the age range of <25 – 34 years, those who had never been married, those who have had ≤5 years in sex work and those who are aware of PrEP. This suggests that younger FSWs are more knowledgeable about PrEP prophylaxis. This finding varied with the reports by [27] in East Africa who reported association between young age and poor PrEP Knowledge which was also supported another resent study [28] who reported that younger sex workers aged 19-24 were more likely not to be knowledgeable about PrEP. Data from our study may be because those young age population are actively searching for more knowledge, especially in this era of access to information communication technology. Further, it could be because of those young population wanting to prevent HIV so that they can enjoy an HIV-free marriage and motherhood hence the condomless sex practice with their boyfriends (intimate partners) who they may hope to marry in future. The poor awareness of

PrEP among older FSWs is worrisome and calls for urgent programmatic revision, capacity building for health personnel in OSS and key population-friendly health facilities and intensified public awareness of HIV prophylaxis use among older people. Regardless, more evidence is needed to further understand while those with a shorter duration of sex work being more aware of PrEP.

PrEP acceptance in this study may be adjudged low as only 8.1% of respondents were willing to use PrEP. The majority (57.4%) of the respondents that were non-willing to accept and use PrEP cited the use of herbal medications as the main reason for not accepting PrEP or recommending PrEP to colleagues. This low PrEP findings in this study differs significantly with 79.5% reported by [23] in Mombasa, Kenya and the 84.6% by [25] in Nigeria. Both Kenya and Nigerian studies indicated willingness of Men who have Sex with Men (MSM) and FSWs to accept and use PrEP as an HIV intervention and strategy prevention tool.

Review of the Socio-demographic characteristics indicated that none of the five characteristics of the respondents analyzed were associated with attitude towards PrEP. This differs from the report by [29] that reported younger and newer entrants to sex work being less likely to have a good attitude to PrEP and that by [28] with level of education being significantly associated with PrEP attitude. However, respondents with a weekly client load of 0-11 clients were significantly less associated with an appropriate attitude towards PrEP as compared to those with >11 Clients. This may mean that those who see more clients weekly are more willing to use HIV PrEP. Use of condoms during sex was significantly less associated with willingness to use PrEP. Unlike condom use during sex, those who see 0-7 First Time Clients per Week were significantly more willing to use PrEP. More studies on the relationship between condom use during sex and number of first-time clients seen by FSWs and the willingness to use PrEP are needed to explain this association.

Analysis on previous experience on the use of PrEP indicated that (42.4%) of the respondents reported that they had ever used PrEP. This is different from the report of [23] that reported none of their studied participants had used PrEP. Lower PrEP utilization 0.4% have been reported by [26]. The difference in the outcomes could be because the earlier studies [23, 26] were done when PrEP was newly introduced compared to the scale-up that had been done before this study. None of the socio-demographic variables of the respondents was associated with the practice of pre-exposure prophylaxis. However, a respondent seeing 0-1 Boyfriend client per week was significantly associated with the practice of PrEP. Engaging in unprotected sex was significantly associated with decreased number of respondents that used PrEP compared to not engaging.

The practice of anal sex with a Boyfriend client was significantly less associated with the use of PrEP, which means that a respondent that practices anal sex with boyfriend clients was less likely to use PrEP compared to the one that does not practice anal sex with a boyfriend. The practice of anal sex with first-time clients was significantly associated with an increased number of respondents that used PrEP compared to not engaging in anal sex with a boyfriend.

Conclusion

This study revealed that most of the study respondents were aware of PrEP for HIV intervention and strategy prevention but very few FWSs were willing to accept this biomedical prevention option despite its effectiveness. About half of the FSWs had practiced PrEP. There was a statistically significant association between respondents' awareness on PrEP in association to variables such as age, marital status, and years of sex work. Factors that affect the use of PrEP include lack of knowledge about it, side effects, lack of time to go to a facility to get it, and condom usage. Based on these findings, there is a need for regular health education programs on HIV prevention for

FSWs in order to increase their awareness and encourage best preventive practices. Furthermore, there should be more education on coping mechanisms for PrEP side effects. By addressing factors like age, marital status, and specific aspects of sex work, interventions could be designed to increase PrEP utilization, thereby contributing to the reduction of HIV transmission in this vulnerable population.

Limitations of the Study

A limitation of this research study is that the data were self-reported by study participants. This limited the study because participants may or may not have truthfully reported responses to the survey questions and may be biased in the responses they provided. Participants may have provided answers that they believe to be desired by the researcher to the questions and are expected from them.

Conflict of Interest Statement

The authors have no conflicts of interest to declare. All co-authors have seen and agree with the contents of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

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