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UPTAKE AND FACTORS ASSOCIATED WITH HIV ASSISTED PARTNER NOTIFICATION SERVICES AMONG FEMALE SEX WORKERS IN KISUMU CENTRAL SUB-COUNTY, KENYA: A MIXED METHODS STUDY

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ABSTRACT

Background: Assisted partner notification services aid in the identification and treatment of undiagnosed HIV cases and prevent further transmission. However, it is underutilized among the key populations, particularly female sex workers (FSWs). This study assessed the uptake of partner notification services (PNS) and associated factors among FSWs in Kisumu Central Sub-County, Kisumu. With a niche on preferred HIV partner Notification method, and Time to HIV partner Notification service.

Methodology: A cross-sectional study was conducted using a convergent parallel mixed-method approach to gather data from 310 FSW and 20 Healthcare providers, with enrolment carried out using systematic random sampling and purposive sampling for the qualitative strand in January 2024. Quantitative data were analyzed using R version 4.3.1, applying chi-square tests and multiple logistic regression to explore associations between variables. Qualitative data were analyzed with Dedoose and reflexive thematic analysis to understand factors associated with PNS uptake

Results: The study enrolled 171 FSWs, revealing a response rate of 55%. Only 12.9% (22/171) had undertaken PNS, with the majority 74.3% (127/171), unaware of their partners' HIV status. Contract referral, 93% (159/171) was the most preferred notification method. None of the variables (age category, marital status, duration of sex work, and the number of sexual contacts) exhibited

significant predictors of uptake of partner notification ($p>0.05$). Facilitators to partner notification included willingness to disclose and professional delivery of partner notification by trained personnel, while barriers included fear of violence, stigma, and lack of contact with sexual partners.

Conclusion: Interventions should focus on reducing key barriers while strengthening supportive, professional partner notification approaches to enhance participation. This will enable a safe environment where FSWs feel empowered to disclose their HIV status.

Key Words: Female Sex Workers, HIV, Partner Notification Services, Kisumu Central Sub-County

INTRODUCTION

Partner notification (PN) involves assisting people diagnosed with HIV (index patients) in informing their sexual partners about their HIV status and the need for testing. The goal is to identify undiagnosed HIV cases, provide treatment, and prevent further transmission[1]. Awareness of one's HIV status can reduce the risk of transmission by promoting preventive measures such as HIV post-exposure prophylaxis (PEP) and safer sexual practices. Conversely, lack of awareness is often linked to high-risk sexual behavior [2]

In Kenya, approximately 1.4 million people are living with HIV (PLHIV), with 22,000 new infections and a 3.7% prevalence rate as of 2022 [3]. Among these, 94% know their status [4]. While data specific to Kisumu is limited, a 2013 study estimated the HIV prevalence among FSWs at a staggering 56.8% [5]. To meet the UNAIDS target of diagnosing 95% of all PLHIV, scaling up partner notification services is crucial, especially among key populations like female sex workers (FSWs), where these services are not yet fully implemented.

The uptake of PNS among women varies based on several factors, including socio-demographic characteristics and the type of services offered. Various partner notification

strategies, such as contract, client referral, and provider referral, have been shown to increase testing and diagnosis rates [3]. A study in Western Kenya reported a high acceptance rate of 80% among HIV positive women in 31 health facilities. However, limited government funding, staff shortages, and inadequate community sensitization further hinder the uptake of these services [2].

Female sex workers in particular face unique challenges that affect their willingness to notify partners, such as stigma associated with being both HIV-positive and surrounding the occupation as a sex worker [4]. Additionally, unsupportive communities and environments, and fear of adverse reactions from partners, affect willingness[5]. Without tailored services addressing the unique challenges of FSWs, new HIV infections among this group and their partners are likely to rise, undermining national HIV prevention goals [6].

Yet, most studies focus on the general population, neglecting key populations like FSWs who face a higher risk of HIV transmission to their partners, which undermines broader HIV prevention efforts [2, 7]. To improve HIV case identification and prevention efforts, more data are needed on the feasibility and outcomes of these approaches in key populations. To do so, this

study assessed the uptake and associated factors of HIV partner notification services among FSWs in Kisumu Central Sub-County and explored latent issues affecting partner notification in this high-risk population.

Methodology

Study Area and Population

The study was conducted among FSWs in Kisumu Central Sub-County in Kisumu County, which has an estimated population of 1,632 FSWs out of 5,151 in Kisumu County [8]. The Sub-County is located in an urban area characterized by a high concentration of FSWs due to its strategic location as a commercial and transportation hub. It has numerous hotspots where sex work is prevalent, often driven by socioeconomic factors such as poverty, unemployment, and high population mobility. Moreover, it is primarily served by two major Drop-In Centers (DICEs), one located at Market Ward and the other at Tivoli Centre in Milimani Ward, which provide essential healthcare services, including HIV prevention, treatment, and care.

Furthermore, FSW who were HIV positive, residents of Kisumu Central for at least six months before the study, FSW aged 18 years and above, and who were willing to consent were included in the study, while FSW who were non-residents of Kisumu Central for the last six months and were unable to consent were excluded. Additionally, healthcare providers working from the DICEs in Kisumu Central were included in the study.

Study Design

The investigation employed a convergent parallel mixed-method design in January 2024, where both quantitative and qualitative data were collected concurrently, analyzed separately, and then mixed during the interpretation of the results [9, 10]. Additionally, both strands of data were

given equal priority and interacted freely to respond to the research questions.

Sample size Estimation

The quantitative sample size of the study was arrived at using Cochran's formula, after which the reduction formula was used to adjust the population to a finite [11]. Where N was the estimated population of FSW in Kisumu Central (1632), Z = z value 1.96 at 5% at 95% confidence level, p = prevalence of 50% since no study was found to fit, and with a prevalence for adoption, P = (1-p), d = margin of error taken as 0.05.

q is 1-p = 0.5

d is the degree of accuracy set at 0.05

$$n = \frac{3.8416 \times 0.25}{0.0025}$$

$$n = 384$$

Since the target population 1632, is less than 10,000, reduction formula was used

$$nf = \frac{n}{1 + \frac{n}{N}}$$

$$nf = 384 / 1 + 384 / 1632$$

$$nf = 310$$

Based on the sample size calculation, 310 respondents

Sampling Procedure

Quantitative strand

Systematic random sampling was used to recruit respondents from various hotspots in Kisumu Central, Kisumu County. Additionally, a cluster sampling strategy was applied to select FSWs at the two major

Drop-in Centers (DICEs) in Kisumu Central. Each DICE serves as a hub for providing healthcare services to FSWs.

Qualitative strand

Purposive sampling was employed to identify participants for Key Informant Interviews (KII). The 30 KII involving fifteen clinical officers, ten HIV Testing Services (HTS) providers, three nurses, two field officers, one project officer, and one pharmacist was conducted, which provided insights into the quantitative responses.

Data collection tools and procedures

Quantitative strand employed a Structured, pretested questionnaire that was developed and used to collect data through interviews from FSWs in the study sites. The variables of the questionnaire were based on the research questions and the existing literature review of the study.

Qualitative data were collected by two research assistants through Key Informant Interview guides among 30 healthcare workers from the Drop-in Centers (DICEs). The guide was aligned based on the research questions.

Data Management and Analysis

Quantitative Analysis

SPSS version 29 was used to analyze the data. The researchers employed descriptive statistics to present participant information, uptake of PNS, and multifaceted influential factors. A chi-square statistical analysis determined relationships between independent variables and dependent variables. The statistically significant factors at p-value 0.2 were used in a multiple logistic regression model to evaluate associations and their direction and magnitude, this was to ensure that all the important factors were not excluded in the final model. The

univariate and bivariate results were presented as percentages, in tables and graphs, while the multivariate results were shown as coefficients and ratios to show the strength and direction of association.

Qualitative Analysis

Qualitative data were analyzed using Dedoose. The analysis employed reflexive thematic analysis, where themes and sub-themes emerged exclusively from analysis of the data in correlation with the research questions [12]. This choice was guided by the six approaches of reflexive thematic analysis and its ability to ensure coding validity. Also, patterns of meanings expressed in thoughts, beliefs, and opinions were identified through latent coding. The results and themes identified were used to validate quantitative results and embellish the findings during the interpretation of the final findings

3.9 Ethical Considerations

The study protocol was reviewed and approved by Jaramogi Oginga Odinga University of Science and Technology Ethics and Review Committee, and ethical review was sought from the Ethical Committee, Jaramogi Oginga Odinga Teaching and Referral Hospital (IERC/JOOTRH//519/21). A research license from the National Commission for Science, Technology, and Innovation (NACOSTI) was secured (NACOSTI/P/23/30549). Thereafter, the Kisumu County Department of Health. All participants signed a consent form beforehand. Privacy and confidentiality of the participants and data collected were observed. In addition, Data collection was done in a private location within the DICEs and the hotspots, and research assistants were trained on measures to ensure the confidentiality of information.

Results

Characteristics of Female Sex Workers by HIV Partner Notification Uptake

The study achieved a response rate of 55% (171/310). Out of the respondents enrolled, 62% (106/171) had secondary education. About 38.6% (66/171) were married, and approximately 18.1% (31/171) had been on Anti-Retroviral Therapy (ART) for less than six months. Only 13% (22/171) of the respondents were involved in partner

notification. The majority, 57.3% (98/171), reported engaging in sex work in the bars/ lodgings/ sex dens. Furthermore, a third of the FSWs, 32.2% (55/171), had been in sex work for 2 years. The mean duration of sex work was slightly longer among FSWs who had participated in partner notification (1.97 ± 1.39 years) compared to those who did not (1.84 ± 1.16 years). Interestingly, a significant proportion, 74.3% (127/171) did not know their partners' HIV status. Table 1

Table 1: Characteristics of Female Sex Workers by Partner Notification Uptake

		PNS Uptake		
Variable	Total (171,100%)	Yes (22, 12.9%)	No (149,87.1%)	P-Value
Age Category(years)				
15-19	32(18.7)	1(3.1)	31(96.9)	0.314
20-29	61(35.7)	10(16.4)	51(83.6)	
30-39	59(34.5)	8(13.6)	51(86.4)	
40-49	19(11.1)	3(15.8)	16(84.2)	
Education Level				
None	7(4.1)	1(14.3)	6(85.7)	0.137
Primary	32(18.7)	3(9.4)	29(90.6)	
Secondary	106(62)	11(10.4)	95(89.6)	
Mid-level College	26(15.2)	7(26.9)	19(73.1)	
Marital Status				
Single	73(42.7)	8(11)	65(89)	0.473
Married	66(38.6)	9(13.6)	57(86.4)	
Divorced	17(9.9)	4(23.5)	13(76.5)	
Widowed	15(8.8)	1(6.7)	14(93.3)	
Duration on ART				
<6 months	31(18.1)	4(12.9)	27(87.1)	0.909
1 year	68(39.8)	9(13.2)	59(86.8)	
2 years	55(32.2)	6(10.9)	49(89.1)	

3 years and above	17(9.9)	3(17.6)	14(82.4)	
Mean $\pm$ SD	2.26 $\pm$ 1.00	2.29 $\pm$ 1.06	2.26 $\pm$ 0.99	
Duration of Sex work				
<6 months	26(15.2)	4(15.4)	22(84.6)	0.088
1 year	74(43.3)	9(12.2)	65(87.8)	
2 years	55(32.2)	4(7.3)	51(92.7)	
3 years and above	16(9.4)	5(31.3)	11(68.8)	
Mean $\pm$ SD	1.86 $\pm$ 1.19	1.97 $\pm$ 1.39	1.84 $\pm$ 1.16	
Number of Sexual Contacts				
1 to 2	59(34.5)	10(16.9)	49(83.1)	0.646
3 to 4	62(36.3)	7(11.3)	55(88.7)	
5 and above	50(29.2)	5(10)	45(90)	
Mean $\pm$ SD	3.61 $\pm$ 1.77	3.36 $\pm$ 1.59	3.65 $\pm$ 1.80	
Sex work Place				
Home	33(19.3)	4(12.1)	29(87.9)	0.294
Hotels/lodgings	40(23.4)	8(20)	32(80)	
Bars/lodging/sex dens	98(57.3)	10(10.2)	88(89.8)	
Knowledge of Partners HIV Status				
Positive	2 (1.2)	0	2(100)	0.163*
Negative	42(24.6)	9(21.4)	33(78.6)	
I don't know	127(74.3)	13(10.2)	114(89.8)	

*Fishers exact test

Sexual Partners Elicited as per Age Category

About 619 sexual partners were elicited by the FSWs, of which the majority (214) were elicited by FSWs aged 20-29 years, followed

by those aged 30-39 years (207). The least number of sexual partners (76) was elicited by those aged 40-49 years. Overall, there was one FSW for every four sexual partners elicited; 3.61(95% CI, 3.35-3.88). Table 2

Table 2: Sexual Partners Elicited by FSWs as per Age Category

Age Category (years)	Total	Sexual Partners Elicited by FSWs	Ratio of Partners to FSWs	95% Confidence Interval
15-19	32	122	3.81	(3.22-4.40)

20-29	61	214	3.5	(3.05-3.96)
30-39	59	207	3.5	(3.09-3.92)
40-49	19	76	4	(2.78-5.21)
Total	171	619	3.61	(3.35-3.88)

Preferred HIV Partner Notification Method

preferred client referral, while only 1.8% (3/171) preferred provider referral (Figure 1)

The majority of FSWs, 93% (159/171), preferred contract referral, 5.3% (9/171)

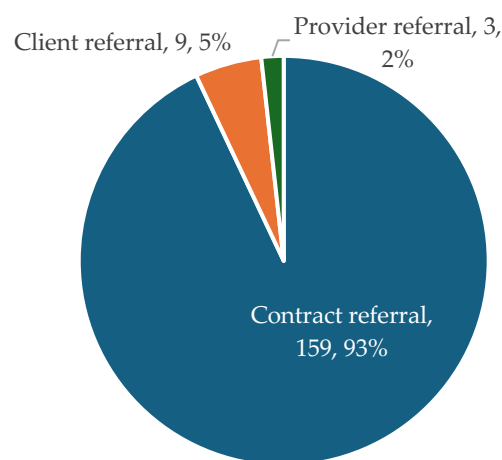


Figure 1: Preferred HIV Partner Notification Method

Qualitative Results

1. Health Service Provider Approach

The majority of the Key informants viewed that HIV disclosure should be done by health service providers (HSPs) rather than by the FSWs themselves. They argued that HSPs possess the necessary knowledge and skills to handle the disclosure process, ensuring that concerns are addressed and promoting better acceptance of the results.

"Notification through HSP is much better since it involves a series of processes that prepare the client and ensure readiness to receive the results."
Nurses, 33, female.

2. Contract Approach

Other informants believed that the FSWs themselves should handle partner notification services, as it could reduce stigma, lower the risk of intimate partner violence, and improve adherence to HIV treatment. Adding that individuals preferred receiving sensitive information directly from the source rather than through intermediaries.

"Clients know their partners better and often know the best timing for the notification process. Providers should support the process when clients feel safe that it's the right option for them."
Clinical Officer, 37, male.

3. A Combined (Dual) Approach

Some informants advocated for a combination of both approaches, where the FSWs would prepare their partners, and the health service provider would step in for the actual notification. This allowed time for the client to assess their partner's understanding of HIV and anticipate their potential reactions.

"It's better done with both FSWs and health service providers after giving the client time to prepare their partner and gauge their

understanding of HIV and their possible reactions." HTS provider, 34, male.

Time to HIV Partner Notification Among Female Sex Workers

When asked about the time they would take to notify their partners of their HIV-positive status, only 1.2% (2/171) indicated they immediately notified their partners, 2.9% (5/171) reported that they took months before notification, while the majority, 95.9% (164/171) did not notify their partners at all (Figure 2).

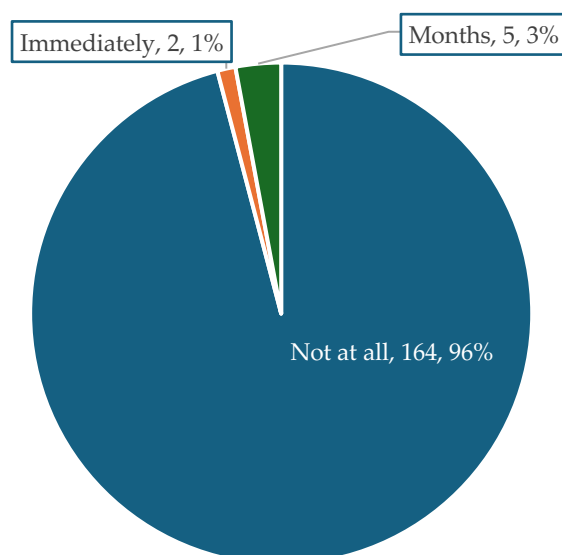


Figure 2: Time to HIV Partner Notification among Female Sex Workers

Qualitative results

1. Delayed Notification and Its Risks

Many HCWs believed that delayed partner notification had serious consequences, noting that it extended the duration of HIV transmission, particularly among discordant couples.

"Immediate assisted notification increases uptake of PNS (Partner Notification Services). Delayed notification leads to longer transmission

time and thus more transmission." Clinical Officer, 39, Male.

2. Benefits of Timely Notification

The respondents emphasized the critical role of prompt partner notification in preventing the further spread of HIV and facilitating timely interventions. They highlighted that early notification not only helps identify infected individuals but also enables immediate access to testing, counseling, and treatment services, which are essential in mitigating the transmission of the virus.

"Timely notification ensures quick interventions, especially for discordant couples, if done promptly." HTS, 28, Female.

3. Contrary Perspective

However, some HCWs argued that delayed notification might have advantages. A period of delay allows the FSWs time to come to terms with their diagnosis and provide accurate information about their sexual partners.

"Delayed notification allows the FSWs time to self-accept and heal, and later provide accurate partner details." Clinical Officer, 35, Female.

Multivariable Predictors of HIV Partner Notification Among the FSWs

None of the independent variables were significantly influenced by HIV partner notification ($p > 0.05$). However, the widows were 1.226 times more likely not to participate in partner notification compared to single FSWs (OR 1.22, 95% CI: 0.13-11.51, $p = 0.858$). Further, those with 5 or more sexual contacts were 1.84 times more likely not to engage in partner notification compared to those with 1 to 2 sexual contacts (OR 1.84, 95% CI: 0.13-6.31, $p = 0.333$). Table 3

Table 3: Multivariable Predictors of HIV Partner Notification Among the FSWs

Variable	No =149(%)	AOR	95% CI	P- Value
Age Category				
15-19	31(96.9)	ref		
20-29	51(83.6)	0.151	0.017-1.313	0.087
30-39	51(86.4)	0.151	0.017-1.354	0.091
40-49	16(84.2)	0.121	0.01-1.43	0.094
Marital Status				
Single	65(89)	Ref		
Married	57(86.4)	0.701	0.235-2.09	0.524
Divorced	13(76.5)	0.34	0.079-1.468	0.148
Widowed	14(93.3)	1.226	0.131-11.516	0.858
Duration of Sex work				
<6 months	22(84.6)	Ref		
1 year	65(87.8)	1.647	0.411-6.607	0.481
2 years	51(92.7)	2.778	0.58-13.311	0.201
3 years and above	11(68.8)	0.492	0.09-2.431	0.384
Number of Sexual Contacts				
1 to 2	49(83.1)	Ref		
3 to 4	55(88.7)	1.499	0.488-4.609	0.48
5 and above	45(90)	1.84	0.536-6.316	0.333

Qualitative Strand

Facilitators of HIV Partner Notification Services

Themes arising from the study to further validate predictors of PNS included unwillingness to disclose, maintaining the HIV negative regular partner, reduction of infections, incentives, support, safer sex negotiation, the need to receive STI prophylaxis, and the fact that it is done professionally by trained personnel were some of the reasons given as facilitators of HIV partner notification.

"The willingness to disclose to maintain a stream of potential clients". Nurse, 36, female.

"The fact that it's done professionally by trained personnel." Nurse, 33, Female.

Barriers to HIV Partner Notification Among the FSWs in Kisumu Central, Kenya

The majority of the key informants emphasized that fear of losing clients, intimate partner violence and stigma as the major barriers expressed by Female Sex workers to HIV notification services.

"Disclosure of others' status, stigma, discrimination, fear of the unknown, and intimate violence are significant concerns." Project Officer, 36, male

Further, fear of intimate partner violence was noted as one of the key barriers. Respondents pointed out that the nature of their work as FSWs poses a challenge to disclosure, as the majority fear physical abuse and reduced negotiation power.

"with multiple sexual partners and undisclosed HIV status, most of them fear being physically abused if they disclose, especially where the FSW is HIV positive. Secondly, with disclosure, there is fear of the price going down and eventually

affecting their negotiation power to other potential clients." Nurse, 36, female.

DISCUSSION

This study examined uptake and determinants of HIV partner notification services among female sex workers in Kisumu Central Sub-County, Kenya, achieving a low response rate. While this response rate may have appeared low, it was justified by the sensitivity of the study involving FSW who are a Key Population living with HIV. These groups often experience extreme levels of stigma and criminalization, hence a lack of disclosure. Furthermore, literature indicated that the response rate in studies involving Key Populations usually ranges between 40-60% [13, 14].

The findings revealed a notably low uptake, with only 13% involved in HIV partner notification. This depicted that many FSWs were not informing their partners of their HIV status, probably because of risks of violence and losing clients during the process. Conversely, previous research in Western Kenya demonstrated high acceptability (80%) of partner notification among the HIV-positive females[2]. Similarly, qualitative research in Tanzania indicated good acceptability, feasibility, and effectiveness of assisted partner notification [15]. The discordant findings might have stemmed from the differences in the study population, since previous research focused on the general population of PLHIV, while paying little attention to key populations such as FSWs. However, a study in Mexico involving key populations, which was almost similar to our study, involving men who have sex with men (MSM) and transgender women, revealed a low uptake (39%) of partner notification among the participants [16]. Contextualizing these

findings, the low uptake in such a context where transactional sex is prevalent increases the risks of HIV transmission, especially among clients unaware of their partners' status.

Contact referral was the preferred partner notification method, followed by client referral, while provider referral emerged as the least preferred method. This was similar to a study in Coastal Kenya showed that provider referral (60.9%) was effective in identifying more cases than index referral in Coastal Kenya [17]. Conversely, a facility-based study in Murang'a, Kenya (n=183), found that the most preferred approach was provider referral (50%), and the least preferred was Dual referral at 4% [3]. These findings were validated by the qualitative results, which reported stigma and fear of the unknown as the major reasons for the choice of notification method. To contextualize, FSWs in Kisumu Central may have preferred partner notification compared to the general population, given the high-risk nature of their work. Further, it suggested that a combined approach involving both healthcare providers and FSWs may enhance partner notification uptake.

The study revealed that a small percentage of the FSWs had immediately notified their sexual partners of their HIV positive status, while a majority, 95.9% did not notify their partners promptly. Previous research has shown immediate partner notification to be more efficacious in promoting HIV testing than delayed partner notification, especially in high HIV prevalence regions [18]. These findings were further validated by the qualitative theme of self-acceptance, where one respondent stated that "Delayed notification allows the FSWs time to self-accept and heal, and later provide accurate partner details." Similarly, this was in concordance with results from a study in Western Kenya, where women cited

emotional unreadiness as a barrier to partner notification [2]. Understanding the drivers and variations in partner notification among key populations is crucial for enhancing access to these services. Moreover, delayed notification was linked to delays in recognizing a client's HIV exposure, hence hindering timely preventive measures against the HIV infection. Participants expressed concerns that delayed notification could prolong transmission time, potentially increasing transmission.

Contrary to initial expectations, none of the independent variables examined, including age category, marital status, duration of sex work, and the number of sexual contacts, was significantly associated with the poor uptake of HIV partner notification among FSWs. Interestingly, the analysis did reveal noteworthy patterns regarding certain subgroups within the FSW population. Specifically, widowed FSWs were found to have 1.226 times higher odds of not participating in partner notification compared to their single counterparts. This could be since widowed FSWs may have faced more stigma and shame due to their marital status. Additionally, wide confidence intervals, especially in marital status, suggest a small sample size or variability in responses. Partner notification has been shown to vary across populations [18]. This observation underscored the potential effect of marital status on partner notification services among FSWs.

Study Limitations

The study was conducted in a single urban setting, limiting the generalizability of the findings to other regions with different socio-economic contexts. Secondly, the study did not include male clients of FSWs, whose perspectives could provide a more comprehensive understanding of the barriers to partner notification. Lastly, this study was

a cross-sectional study, and the true causal relationship could not be established.

Conclusion

This study was carried out to determine the uptake and associated factors of HIV partner notification services among the FSW living with HIV in Kisumu Central Sub-County, with a focus on socio-demographic characteristics of FSWs, preferred HIV partner Notification method, and Time to HIV partner Notification service. The findings revealed low uptake of PNS, as the latent issues supported this by reporting of possibility of physical violence, stigma, and potential loss of clients. Additionally, while the uptake of service was notably low, it was revealed that this would heighten the risk of HIV transmission among unknowing clients, as a high percentage of FSWs reported taking longer before notifying their partners. Lastly, it was observed that elicitation of sexual partners was heavily dependent on age. Older FSWs elicited more sexual partners than younger ones.

Recommendations

This study recommends tailored interventions, such as professional support in partner notification and strategies addressing stigma, to improve notification uptake and curb HIV transmission among FSWs and their clients. Additionally, future research should focus on larger, multi-site studies to enhance generalizability and explore more effective interventions aimed at reducing stigma and fear of client loss.

Data Availability

The data that support this study may be shared upon reasonable request to the corresponding author, if appropriate.

Conflict of Interest

The authors declare that they have no conflicts of interest.

Declaration of funding

The study received no external funding

AUTHOR CONTRIBUTIONS

WA, GA and FO conceived and designed the study. WA, GA, FO, GN, and JO co-drafted the manuscript. All the authors read and approved the final manuscript.

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