

Factors associated with knowledge and use of hiv prevention strategies among female sex workers in 12 brazilian cities

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Abstract *This article aims to Identify factors associated with knowledge and use of combined HIV prevention strategies among female sex workers (FSW). Cross-sectional epidemiological study, using the Respondent Driven Sampling (RDS) method. Descriptive analyzes were performed after adjustments required by the RDS method. To investigate factors associated with knowledge of PEP and PrEP and use of the female condom, Poisson regression was applied, using odds ratio as an association measure. FSW not affiliated with NGOs, who did not receive informational material on prevention and / or participated in lectures in the last six months and who do not identify themselves as FSW in healthcare service facilities have less knowledge about PEP and PrEP and use the female condom less frequently. In general, FSW do not have sufficient knowledge and access to combined HIV prevention methods to take advantage of their benefits. We believe that the adoption of different models of care for FSW in partnership with NGOs can be an effective strategy for expanding knowledge and use of HIV prevention methods in Brazil.*

Key words *HIV, Sex work, Prevention*

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Introduction

In Brazil, there are approximately 900,000 people living with HIV (PLHIV), and an average of 40,000 new cases are registered every year^{1,2}. The HIV epidemic in Brazil is considered to be concentrated in some population segments, including female sex workers (FSW) who have an estimated prevalence rate of 5.3% (95% CI: 4.4% - 6.2%) higher than the general population (0.4%)^{1,3}.

Another important data is the increased prevalence of syphilis in this population, the estimated prevalence of syphilis in 2016 (8.5%; 95% CI: 7.3% - 9.7%) was 3.5 times higher than in 2009 (2.4%; 95% CI: 1.7% to 3.4%). In addition, the prevalence estimates for HBV and HCV were 0.4% (95% CI: 0.2% - 0.7%) and 0.9% (95% CI: 0.6% - 1.3%)³.

A total of 207,207 (69.0%) cases of HIV infection in men and 93,220 (31.0%) cases in women were reported at SINAN between 2007 and June 2019. The sex ratio for the year 2018 was 2.6 (M:F), that is, 26 men for every ten women. Among women, 37.2% of the cases were among white women and 53.6% among black women (12.9% black women and 40.7% brown women)¹.

Also according to the HIV Epidemiological Bulletin published by the Ministry of Health in 2019, there was a downward trend in the detection rate among women in the last ten years, which went from 17.0 cases / 100,000 inhabitants in 2008 to 10.5 in 2018, pointing to a decrease of 38.2%¹.

Among women, it appears that, in the last ten years, the HIV detection rate has dropped in all age groups, with the 25-29 and 30-34 age groups having the greatest decrease: 51.2% and 53.2%, respectively, when comparing the years 2008 and 2018¹.

In 2018, the age groups with the highest detection were women between 40 and 44 years old (20.5 cases / 100,000 inhabitants)¹.

In Latin America, the HIV epidemic is mostly concentrated, considered to be at stable levels in the general population (0.2 - 0.7%). In the Caribbean, the epidemic is widespread and features one of the highest HIV prevalence rates in the world (<0.1-3%), with women accounting for half of all infections. The epidemiological scenario of HIV in Latin American countries is more prevalent among men who have sex with men (MSM), about 11% to 17% in most countries, with the exception of Bolivia (25%), Mexico and Paraguay (21%) showing prevalence above 20%^{4,5}.

100,000 new HIV infections were registered in Latin America in 2017. Brazil is responsible for 35% of the total number of PLHIV in the region and for 47% of new infections that occurred in that period. About 1% of Chile's sex workers, Colombia, Costa Rica, Guatemala, Paraguay, Peru and Uruguay were living with HIV in 2017 compared to about 5% in Bolivia, Brazil and Panama. In the Caribbean, the prevalence varies between 2% in Jamaica and 6% in Guyana. Almost 90% of new infections in that period occurred in Cuba, the Dominican Republic, Haiti and Jamaica. Haiti accounts for almost half of new annual HIV infections and AIDS-related deaths⁴.

Worldwide estimates show that female sex workers may be 13.5 times more likely to have HIV than other women (95% CI 10; 0 - 18 · 1)⁴.

Stigma and discrimination are important barriers that hinder access and use of health services, mainly due to the fear of identifying as a sex worker and receiving inadequate treatment from health professionals^{6,7}. A study conducted by RedTraSex (*Red de Mujeres Trabajadoras Sexuales de Latinoamérica y el Caribe*) in 14 Latin American countries demonstrated that almost two thirds of sex workers interviewed had not informed their healthcare provider about their work in their latest appointment. (REDTRASEX, 2013).

Sex work is not considered a crime in Brazil; illegality is characterized when minors are involved or if there is sexual exploitation. Even so, this occupation is not yet free from discrimination and human rights violations⁶⁻⁸. The abolitionist model, adopted in Argentina and also in Brazil since 1942, when the current Penal Code came into force, paved the way for a certain degree of omission by the State with regard to the guarantees and fundamental rights of those who exercise sex work. Even though sex work is not deemed a crime, those who work in this field are on the margins of society with regards to labor and social security rights (9, 10).

Unlike Brazil, other South American countries such as Uruguay, Ecuador and Bolivia have adopted regulation in their legal system. The profession is regulated, but some requirements must be met, such as periodical screenings for STIs, or allowing women to work only in certain places. Some legal assurances are also made possible through professional contracts, social insurance and retirement plans¹⁰.

HIV prevention strategies in Brazil have featured different stages of implementation. Data from a survey on knowledge, attitudes and prac-

tices among the Brazilian population (*Pesquisa de Conhecimentos Atitudes e Práticas na População Brasileira* - PCAP) conducted in 2013 and resealed by the Ministry of Health show that most Brazilians (94%) know that condoms are the best way to prevent STIs. However, 45% of the sexually active population have admitted to not wearing protection during sex in the past 12 months¹¹.

In the 90's we experienced the so-called 'feminization' of the HIV epidemic in Brazil evidence pointed to an increase of cases among women. In order to tackle this problem, female condoms started to be distributed by the Brazilian Universal Health System (SUS) in the 2000's (NEPO, ABIA e UNFPA, 2011). Female condoms are considered really important since it is a form of protection under a woman's control, allowing her to have more autonomy with regards to her own body and sex life. This is especially relevant when we take into account situations where the use of male condoms has to be negotiated¹².

In addition to the more traditional biomedical interventions, which include, among other strategies, the use of barrier methods such as, for example, condoms, there is another group of interventions that are related to the use of antiretrovirals (ARV) in order to limit the capacity of HIV to infect individuals^{13,14}.

Post-Exposure Prophylaxis (PEP) is the use of antiretrovirals (ARV) for 28 days, after any situation in which there is a risk of contact with the HIV virus. The recommendation is to start PEP within 72 hours, being more effective if started within the first two hours after exposure. PEP has been available in the Brazilian Universal Health System (SUS) for health professionals who have had exposure to the HIV virus resulting from an occupational accident with sharp piercing material since 1999. Its offer has also been expanded to other types of exposure, as in case of consenting sexual exposure and in cases of sexual violence. In recent years, the supply of PEP has increased from 15,540 in 2009 to 107,340 in 2018^{15,16}.

Brazil was the first country in Latin America to institute treatment for all PLHIV, regardless of the CD4 + value, since 2013. Until 2017, 45% of Latin American countries had adopted the same health policy, but treatment coverage varies enormously between countries: from 36% in Bolivia to 67% in Peru (in Latin America) and from 31% in Belize, to 66% in Cuba (in the Caribbean) (4). AIDS-related conditions remain the leading cause of death among PLHIV in the Americas region^{4,5}.

HIV pre-exposure prophylaxis (PrEP) consists of the use of antiretrovirals by people who are not infected with HIV, but who may be in a situation in which they may be exposed to the virus. PrEP was the biomedical intervention most recently incorporated into the scope of Combined Prevention in Brazil, in 2017^{17,18}.

PrEP supply is scarce across the Latin American region. Brazil is the only country in the region where PrEP has been made available in the Brazilian Universal Health System (SUS). Even in other Latin American countries that also have universal public health systems, PrEP is not offered free of charge. In Chile, Costa Rica, Guatemala, Mexico and Uruguay, PrEP can be obtained through private health providers, or research projects. The Bahamas and Barbados were the only Caribbean countries that offered PrEP through a public health system in 2018, although it is also available in the private health system in Jamaica and Suriname. PrEP is not yet available in Cuba, the Dominican Republic and Haiti⁴.

Since 2013, Brazil has been investing in combined prevention models to try to contain the spread of HIV cases. In an epidemiological scenario with a higher prevalence of HIV in some population segments, it is important that these groups can have easier access to prevention methods. Currently the country has adopted methods and strategies for combined prevention: providing female and male condoms, lubricating gel, regular testing for HIV, hepatitis B and C and Syphilis; prevention of vertical transmission (when the virus is transmitted to the baby during pregnancy), supported especially by measures focused on prenatal medicine; diagnosis and treatment of STIs and viral hepatitis; vaccination against hepatitis A and B; harm reduction programs for people who use alcohol and other substances; pre-exposure prophylaxis (PrEP); post-exposure prophylaxis (PEP); and treatment for people living with HIV (PLHIV)^{13,14}.

Given the importance of the Brazilian HIV epidemic in the Americas region, this article aims to identify the main factors associated with knowledge and use of HIV prevention measures among sex workers, providing evidence to support the adoption of interventions that facilitate FSW access to combined prevention strategies.

Materials and methods

This is a cross-sectional epidemiological study, using sampling based on the Respondent Driven

Sampling (RDS) methodology. This data was collected from the study carried out in 2016, called “Current Health Project II”, conducted between June and November 2016, with the objective of estimating the prevalence of HIV, syphilis and hepatitis B and C and of evaluate knowledge, attitudes and practices related to HIV infection and other sexually transmitted infections (STIs) among FSW^{3,19,20}.

The cities and the minimum sample size were chosen by the Department of Chronic Conditions and Sexually Transmitted Infections (DCCI) of the Ministry of Health (MS), according to geographic and epidemiological criteria. The pre-established sample size was at least 350 valid interviews per city, in some places this number was slightly higher, totaling 4,328 FSW interviewed^{19,20}.

Data from 4,328 questionnaires filled out by female sex workers in the cities of Manaus, Belém, Fortaleza, Recife, Salvador, Belo Horizonte, Rio de Janeiro, São Paulo, Curitiba, Porto Alegre, Campo Grande and Brasília were analyzed. Eligibility criteria included being a woman biologically; minimum 18 years old; being a sex worker in one of these cities; having exchanged sex for money at least once in the four months prior to the interview; show a valid coupon; not having participated in the research previously; not showing evidence of drug or alcohol use at the time of participation; accept the invitation and sign the consent form. The complete description of the methodology used was published by Damacena (2019)²⁰.

In this study we used a descriptive analysis to know the main characteristics related to the access and use of combined HIV prevention methods and to register the patterns related to the use of healthcare services. We considered variables regarding access (if they received condoms and lubricating gel) and the use of HIV prevention methods (female and male condoms, lubricating cream / gel, HIV and syphilis treatment, hepatitis B vaccination, PrEP and PEP) and patterns related to the use of healthcare services (the facility where they were provided with prevention methods and / or attended lectures in the last six months; where they sought treatment once infected with an STI; where assistance was sought in cases of physical, verbal or sexual violence; and if they identified themselves as FSW in the healthcare facilities).

In the descriptive analysis, the prevalence of the variables of interest were calculated after adjusting for the different population sizes of the

12 cities (where the sample size of each had been set at 350), and the homophily correction, which consists of the trend to recruit people with similar characteristics, a methodological requirement of the RDS sampling technique.

The factors associated with two outcomes of interest “knowledge about PEP and PrEP” and “Use of female condoms” were investigated. Initially, bivariate analyzes were performed and tests of corresponding hypotheses were applied (Chi-square and when necessary Fisher’s test), the respective 95% confidence intervals, prevalence ratios and respective p values were calculated. Subsequently, the Poisson regression model was used.

The variables “education”, “identification as a sex worker in the health service”, “workplace” and “time of exposure in the profession” were dichotomized to facilitate the analysis.

The order of entry of each of the variables in the model followed according to the level of significance and the strength of association. The variables that entered the model should have a significance level of p-value <0.10). Adjustments of the model were evaluated by verifying if any variable lost significance. If positive, it was removed, and the next variable entered as a sequence. This was the procedure used to estimate each of the models, with the measure of association being the odds ratio and its 95% confidence interval.

The research project was approved by the Research Ethics Committee of the Oswaldo Cruz Foundation. The database was provided by the Department of Chronic Diseases and Sexually Transmitted Infections of the Secretariat of Health Surveillance of the Ministry of Health DCCI / SVS / MS^{19,20}.

Results

Table 1 shows the main characteristics related to access and use of combined prevention methods. Most participants received male condoms in the last six months (82.0%), but about 66% and 60% stated that they had not received a female condom and lubricating cream / gel respectively, in the same period.

About 37% of the participants were not vaccinated against hepatitis B and a percentage of 16.5% were unaware of their vaccination status. Among those FSW who reported having been vaccinated, 14.6% did not remember the number of doses.

Table 1. Description of access and use of combined prevention methods among female sex workers in twelve Brazilian cities in 2016.

Acess	n	%	CI
Male condom			
Yes	3,449	81.9	80.2 - 83.4
No	764	18.1	16.6 - 19.8
Female condom			
Yes	1,407	33.5	31.6 - 35.5
No	2,790	66.5	64.5 - 68.4
Lubricating gel/cream			
Yes	1,697	40.3	38.4 - 42.3
No	2,509	59.7	57.7 - 61.6
Use	n	%	CI
Female condom			
Yes, frequently	262	6.2	5.3 - 7.3
Yes, occasionally	1,039	24.7	23.1 - 26.4
No, never	2,900	69	67.2 - 70.8
Hepatitis b vaccine	n	%	IC
No	1,568	37.4	35.6 - 39.3
Yes (1, 2 or 3 doses)	1,319	31.5	29.7 - 33.3
Yes. But i can't remember the nº of doses	612	14.6	13.2 - 16.1
I don't know	691	16.5	15.1 - 18.0
Hiv treatment	n	%	CI
Yes. I do	64	71.3	57.7 - 80.3
I did. But i stopped	4	4.1	1.5 - 10.8
No	22	24.6	14.9 - 36.7
Syphilis treatment	n	%	CI
Yes	423	87.8	83.8 - 90.9
No	59	12.2	9.1 - 16.2
PEP	n	%	CI
Yes	131	7.1	5.7 - 8.8
No	1,729	92.9	91.2 - 94.3

CI: Confidence interval.

Source: Author's elaboration.

With regards to HIV treatment, among those women who knew their diagnosis, an important percentage of about 29% interrupted and / or did not start treatment.

For the treatment of syphilis, a lower percentage of women who did not undergo treatment after diagnosis (12.2%) was found.

Post-exposure prophylaxis (PEP) was used by only 7.1% of the women interviewed.

Table 2 presents information on health services and the type of assistance received by FSW.

In this table it is possible to observe that the public health service was the place where the majority had access to methods of prevention and information.

In relation to the occurrence of sexually transmitted infections (STIs) in the last year, the preferred place for care was the local free clinic or family health clinic (51.3%). About 17% reported not having sought any services.

More than 70% of women who suffered physical or sexual violence did not seek a health service and just over half of the study participants reported never identifying themselves as FSW in healthcare facilities (51.5%).

Table 3 presents information related to the factors associated with the knowledge of PEP and PrEP from the proposed logistic model. In this table we can see that FSW who had more access to education and those who worked in private places were respectively 50% and 25% more likely to have knowledge about post-exposure prophylaxis (PEP).

In contrast, FSW who hadn't joined or become members of NGOs (PR: 0.60; CI: 95 %; 0.45-, 0.83), who hadn't attended lectures, nor received prevention materials in the previous six months (PR: 0.67; CI: 95%: 0.56-0.83), who wouldn't see the same healthcare provider (PR: 0.74; CI: 95%: 0.60-0.92) and who did not identify themselves as sex workers in the healthcare facility (PR: 0.74; CI: 95%: 0.61-0.91) consisted in the group of workers least likely to have knowledge about PEP. In all analyzes there was statistical significance.

With regards to PrEP, it was possible to identify an association between less knowledge about prophylaxis among women who hadn't joined NGOs (PR: 0.49; CI: 95%: 0.35-0.69), nor received prevention materials in the previous six months (PR: 0.65; 95% CI; 0.50-0.85) and who didn't identify themselves as sex workers in healthcare facilities (PR: 0.56; CI: 95%: 0.44-0.74).

Table 4 provides information related to the factors associated with the use of female condom. In this table, it is possible to note that women who worked in private places (PR: 0.77; CI: 95% 0.61-0.99), were not members of NGOs (PR: 0.57; CI: 95%: 0.40-0.83), had not received educational material about STIs and /or hadn't attended lectures in the previous six months (PR: 0.57; 95% CI; 0.57-0.94) and also did not identify themselves as a sex worker in healthcare facilities (PR: 0.54; CI: 95%; 0.42-0.70) were less likely to use a female condom.

Table 2. Description of health services and assistance.

Where did you receive female condoms for free?	n	%	CI
At a public healthcare service	904	64.2	60.9 - 67.3
At an NGO or other organization	159	11.3	9.3 - 13.7
Where I work as a sex worker	271	19.2	16.8 - 22.0
At a bar, club, bathhouse or saunas	11	0.8	0.4 - 1.4
I got it from a prevention worker	204	14.5	12.2 - 17.1
Where did you attend a lecture or receive educational material?			
At a public health service	522	50.8	47.0 - 54.6
At an NGO or other organization	177	17.3	14.5 - 20.3
Where I work as a sex worker	174	17	14.5 - 19.7
Somewhere else	176	17.2	14.5 - 20.4
In the past 12 months, did you have any problem related to sexually transmitted diseases? Which service did you seek first?			
Drugstore	254	18.2	15.8 - 21.0
Free clinic or family health clinic	714	51.3	47.8 - 54.6
SAE, Specialist Center, public clinic or PAM	27	1.9	1.1 - 3.3
UPA or another public healthcare facility	36	2.6	1.7 - 4.0
Public hospital clinic	29	2.1	1.3 - 3.2
Private practice	80	5.8	4.4 - 7.5
Private emergency	7	0.5	0.2 - 1.3
A physician or healthcare professional at my workplace	6	0.4	0.1 - 1.3
No service whatsoever	240	17.2	14.0 - 19.9
Have you received any type of assistance because of physical or verbal violence?			
Yes	187	22.6	19.2 - 26.5
No	638	77.4	73.5 - 80.8
Have you sought any type of assistance due to sexual violence?			
Yes	288	26.5	23.3 - 30.0
No	797	73.5	70.0 - 76.7
When you visit a healthcare provider, do you say you are a sex worker?			
Yes, always	1.014	24.3	22.7 - 25.9
Sometimes	626	15	13.6 - 16.4
Usually no	386	9.2	8.1 - 10.5
I never identify myself as a sex worker	2.153	51.5	49.6 - 53.5

Source: Author's elaboration.

Women who had been performing sex work for more than 5 years (PR: 1.31; CI: 95%; 1.02-1.70) and who reported using condoms during vaginal sex with a stable partner more than half of the time the sexual encounter occurred (PR: 2.39; CI: 95%; 1.57-3.65) were more likely to use a female condom.

Discussion

Our analysis shows that despite the high percentage of women receiving male condoms (81.9%), about two thirds of the participants reported not having received a female condom. The greatest chance of using the female condom is related to performing sex work for more than

5 years and using a condom with a stable partner.

Data released by the Ministry of Health from the survey on knowledge, attitudes and practices among the Brazilian population (PCAP) carried out in 2013, indicated that despite the high level of knowledge of women about the female condom (85%), its use is low (5.0%). The survey also did not point out significant differences in condom use related to education and social class¹¹.

The female condom has been incorporated into health services since the year 2000, but its distribution has not followed major guideline campaigns on its use. There was little publicity, commercialization and, at times, interruption of

Table 3. Bivariate and multivariate analysis of factors associated with knowledge of PEP and PrEP among female sex workers from twelve Brazilian cities, 2016.

Factors	Knowledge of PEP				Knowledge of PrEP			
	Bivariate		Multivariate		Bivariate		Multivariate	
	PR	CI 95%	PR	CI 95%	PR	CI 95%	PR	CI 95%
Education								
Incomplete primary – incomplete junior high	1.000		1.000		1.000		-	-
Incomplete junior high – incomplete and complete higher ed.	1.571	1.32 - 1.87	1.492	1.25 - 1.79	1.186	0.92 - 1.52	-	-
Workplace								
Street	1.000		1.000		1.000		-	-
Private place	1.457	1.21 - 1.75	1.275	1.05 - 1.55	1.041	0.80 - 1.35	-	-
Have you joined or become a member of an NGO?								
Yes	1.000		1.000		1.000		1.000	
No	0.506	0.38 - 0.67	0.609	0.45 - 0.83	0.426	0.30 - 0.59	0.493	0.35 - 0.69
Have you attended any lecture and/or received educational material on STIs/AIDS in the past six months?								
Yes	1.000		1.000		1.000		1.000	
No	0.603	0.50 - 0.73	0.679	0.56 - 0.83	0.569	0.44 - 0.74	0.654	0.50 - 0.85
Do you usually go to the same healthcare provider?								
Yes	1.000		1.000		1.000		-	-
No	0.719	0.59 - 0.88	0.742	0.60 - 0.92	0.945	0.71 - 1.26	-	-
Do you identify yourself as a sex worker to your healthcare provider?								
Yes*	1.000		1.000		1.000		1.000	
No*	0.739	0.61 - 0.90	0.747	0.61 - 0.91	0.537	0.41 - 0.69	0.569	0.44 - 0.74

PR: prevalence ratio; CI: confidence interval.

Source: Author's elaboration.

its supply. These factors have considerably limited its use¹².

The female condom made of nitrile rubber is not allergenic and can be placed up to 8 hours in advance, which makes it easy in sex work contexts, where negotiation on condom use is often necessary. Thus, the woman starts to occupy a central and decisive place related to the degree of risk to which she intends to submit¹².

Grangeiro et al.²¹ studied methods of prevention and structural interventions that can have an impact on the incidence of HIV, and one of the results points to the important contribution of the female condom in reducing risks for FSW in situations of violence or who engage in condomless sex with clients as a way to seek higher pay²¹.

Among the biomedical interventions that make up the scope of combined HIV prevention is hepatitis B vaccination. In our analysis, about

31% would be eligible for vaccination i.e., they should be vaccinated, but were not and / or had not received all doses to ensure immunization.

The lack of knowledge about the risk of hepatitis B and lack of access to health services are some of the situations that hinder the immunization of the most vulnerable populations.

As for sex workers living with HIV, we found about 29% who reported not having treatment and/ or having interrupted it. Currently there is irrefutable evidence (studies HPTN 052²², Partner²³ and Opposites Attract²⁴, which demonstrate that PLHIV under treatment, and with good adherence to antiretroviral therapy (HAART), quickly reach viral suppression. This is evidence of an extremely positive impact in reducing HIV transmission, underpinning current recommendations of treatment as prevention²¹⁻²⁵.

Carvalho et al.²⁶ carried out an integrative literature review and identified multiple factors

Table 4. Bivariate and multivariate analysis of factors associated with the use of female condoms by female sex workers from twelve Brazilian cities. Brazil, 2016.

Factors	Female condom use			
	Bivariate		Multivariate	
	PR	CI 95%	PR	CI 95%
Workplace				
Street	1.000		1	
Private place	0.758	0.63 - 0.91	0.7780462	0.61 - 0.99
Period of exposure in the profession				
<5 years	1.000		1	
5 years or more	1.346	1.11 - 1.62	1.313703	1.02 - 1.70
Have you joined or become a member of an NGO?				
Yes	1.000		1	
No	0.509	0.38 - 0.67	0.5768557	0.40 - 0.83
Have you attended any lecture and/or received educational material on STIs/AIDS in the past six months?				
Yes	1.000		1.000	
No	0.713	0.59 - 0.86	0.734	0.57 - 0.94
In the past 6 months, how frequently did you use a condom during vaginal sex with one (or more) stable partner(s)?				
Never	1.000		1.000	
Less than half the time	1.211	0.84 - 1.74	1.356	0.93 - 1.98
More than half the time	2.438	1.63 - 3.64	2.396	1.57 - 3.65
Always	1.777	1.38 - 2.28	1.744	1.35 - 2.25
Do you identify yourself as a sex worker to your healthcare provider?				
Yes	1.000		1.000	
No	0.579	0.48 - 0.70	0.541	0.42 - 0.70

PR: prevalence ratio; CI: confidence interval.

Source: Author's elaboration.

associated with adherence to ART, including individual issues; treatment characteristics; infection characteristics, aspects of the relationship with the healthcare service and social support. According to these variables, adherence assumed different values depending on the population studied, confirming the heterogeneous and regional character of factors related to adherence²⁶.

Expanding the number of PLHIV under treatment and reducing the number of people abandoning ART are two important challenges for Brazil and other Latin American countries. It is estimated that, by the end of 2018, there were approximately 900,000 PLHIV in Brazil, of which 766,000 (85%) were diagnosed. Among the latter, 594 thousand (66%) were under treatment, and 62% (554 thousand) had an undetectable viral load^{5,12}. In Latin America, in 2018, 80% of PLHIV were diagnosed, among these 62% were being treated and 55% achieved viral suppression⁴.

In the context of sex work, this is a challenge that is faced with the specificities and vulnerabilities that accompany it, such as barriers to healthcare services, including stigma and discrimination.

Some studies abroad have demonstrated the benefits of starting HIV treatment outside healthcare service facilities, provided ART is started safely. A study carried out in Malawi identified a greater number of people who start treatment at home than those who were referred to a healthcare service facility. For Ford *et al.*, starting ART outside of healthcare service facilities can expand and improve access to HIV treatment, especially for populations with difficulties to access it. In Tanzania, this possibility improved the rates of ART initiation and reduced treatment dropout among sex workers²⁷.

The indication that PEP was little used by FSW (7.1%) coupled with the fact that women

who had a higher level of education and who worked in private places would have a better chance of having knowledge about PEP are data that can support the expansion and improvement of PEP supply in the country. For most sex workers work on the street and have a low level of education, according to the findings of Szwarcwald et al. in a study conducted with the same population²⁸.

Factors associated with less knowledge about PEP and PrEP are related to the difficulty of accessing information, not seeking the same healthcare provider nor disclosing their profession. Cohen et al. describes among the lessons learned in the PEP program in the city of San Francisco (USA), that the lack of knowledge of PEP among potential users contributes to its underutilization²⁹. In general, sex workers do not have enough knowledge about PEP and PrEP to take advantage of its benefits.

Public services, especially family health clinics, are the places that sex workers look for when it comes to a problem related to sexually transmitted infections (STIs) (51.3%). In contrast, those who were victims of physical or sexual violence did not seek any assistance. This is an important piece of information that can support the organization of the care networks for victims of Violence by planning and implementing primary care services combined with other health and social protection equipment. The expansion of this type of service must necessarily be linked to the offer of combined prevention technologies.

Another important finding was related to the need to be linked to an NGO so that FSW have more access to information. In addition, this articulation between NGOs and public health and social protection sectors could enhance the positive effects of HIV prevention related to the empowerment of FSW.

A significant percentage of the participants in this study reported never declaring themselves as a sex worker when seeking a health service (51.5%). Dourado et al. point out to stigma and discrimination as the main barriers to accessing health services. The authors refer that the adop-

tion of invisibility is a strategy to avoid discriminatory attitudes on the part of health professionals³⁰.

Limitations

In addition to the limitations inherent to RDS methodology described by Damascena et al.²⁰, we can mention the fact that the collection of data during the interview did not include issues related to combined prevention, a prevention model adopted by Brazil. Other limitations are related to the issues of use of PEP and knowledge of PrEP by sex workers, who could have considered the availability of these in healthcare services. For the use of PEP, the clinical recommendation may have constituted an important bias.

Conclusion

Despite the limitations of this study, it was possible to identify that sex workers still do not have guaranteed access to combined prevention technologies in Brazil, especially the use of female condoms and PEP, HIV treatment and hepatitis B vaccine. It is evident in this study that barriers, mainly those related to stigma and discrimination, prevent FSW from benefiting from such methods, especially in situations that involve violence.

The profile of FSW with less knowledge about biomedical interventions (PEP and PrEP) was associated with not joining an NGO, not attending lectures and / or accessing information on prevention in the previous six months. It was also associated with the fact that they did not identify themselves as FSW in health services.

Thus, we consider that the expansion of the combined prevention offer in primary care services (PHC), the adoption of distinct care models and the promotion of an environment free from discrimination can contribute significantly to these methods to reach those who would most benefit from them, such as FSW, thus preventing new infections.

Collaborations

The authors have significantly contributed to the article and agree with the content of the manuscript. AF Kolling and E Merchan-Hamann participated in the study conceptualization and design, data analysis and interpretation, writing of the article, and approval of the final version. SB Oliveira participated in statistical analysis, data interpretation, revision of the manuscript, and approval of the final version.

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