

ACCESS AND USE OF PRE-EXPOSURE PROPHYLAXIS FOR HIV IN THE CITY OF SANTA MARIA, RS¹

ACESSO E UTILIZAÇÃO DA PROFILAXIA PRÉ-EXPOSIÇÃO AO HIV NO MUNICÍPIO DE SANTA MARIA, RS

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ABSTRACT

Pre-Exposure Prophylaxis (PrEP) for Human Immunodeficiency Virus (HIV) began to be offered in the city of Santa Maria, in the central region of Rio Grande do Sul (Brazil), in November 2020, and until August 2022 it was intended for key populations considered more exposed to HIV infection. Due to the short time of PrEP use in the city, limited information on access and utilization of prophylaxis is available. Thus, this study aimed to identify the sociodemographic profile and PrEP use in the city of Santa Maria. Data from 180 users who initiated prophylaxis between November 2020 and August 2022 were analyzed. Of these, 103 (57.3%) were correctly adhering to prophylaxis, while 77 (42.7%) discontinued its use. The sociodemographic profile of users consisted of cisgender men, homosexuals, white, aged between 18 and 24 years old, with ≥ 12 years of education, without a stable relationship, and residing in the central region. Regarding PrEP use, 78.8% ($n=142/180$) belonged to the population of gays and other men who have sex with men, 62.8% ($n=113/180$) were regularly using the medication, and 75% ($n=135/180$) reported no adverse events related to PrEP. A low incidence of sexually transmitted infections was observed. The results underscore the need for strategies aimed at reaching the population most vulnerable to HIV infection in the city and understanding the factors leading to its discontinuation.

Keywords: antiretrovirals; disease prevention; human immunodeficiency virus.

RESUMO

A Profilaxia Pré-Exposição (PrEP) ao Vírus da Imunodeficiência Humana (HIV) começou a ser ofertada no município de Santa Maria, na região central do Rio Grande do Sul (Brasil) em novembro de 2020, e até agosto de 2022 era destinada à populações-chave, consideradas mais expostas à infecção pelo HIV. Devido ao pouco tempo de uso da PrEP no município, poucas informações sobre o acesso e utilização da profilaxia estão disponíveis. Assim, este estudo objetivou identificar o perfil sociodemográfico e de uso da PrEP no

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município de Santa Maria. Foram analisados os dados de 180 usuários, que iniciaram a profilaxia no período de novembro de 2020 a agosto de 2022. Destes, 103 (57,3%) estavam retirando corretamente a profilaxia e 77 (42,7%) descontinuaram o seu uso. O perfil sociodemográfico dos usuários foi de homens, cisgêneros, homossexuais, brancos, com idade entre 18 e 24 anos, escolaridade ≥ 12 anos, sem relacionamento fixo e que residem na região Central. Com relação ao uso da PrEP, foi observado que 78,8% ($n=142/180$) pertenciam a população de gays e outros homens que fazem sexo com homens, 62,8% ($n=113/180$) estavam em uso regular da medicação e 75% ($n=135/180$) não relataram eventos adversos à PrEP. Baixa incidência de infecções sexualmente transmissíveis foi observada. Os resultados reforçam a necessidade de estratégias que visem atingir a população mais vulnerável à infecção pelo HIV no município e compreender os fatores que levam à sua descontinuidade.

Palavras-chave: *antirretrovirais; prevenção de doenças; vírus da imunodeficiência humana.*

INTRODUCTION

Pre-Exposure Prophylaxis (PrEP) for Human Immunodeficiency Virus (HIV) began to be provided in Brazil by the Unified Health System (SUS) in late 2017 (Brasil, 2018). It is part of the Combined Prevention Strategy, which aims to combine different actions for HIV prevention, sexually transmitted infections (STIs), and viral hepatitis. In addition to PrEP, the strategy includes regular HIV testing, Post-Exposure Prophylaxis (PEP) for HIV, consistent and correct condom use, timely diagnosis, and appropriate treatment of STIs, harm reduction, risk and vulnerability management, viral replication suppression through antiretroviral treatment, immunizations, and prevention of vertical transmission of HIV, syphilis, and Hepatitis B (Brasil, 2022a).

PrEP consists of a combination of two antiretrovirals (ARVs), tenofovir disoproxil fumarate 300 mg and emtricitabine 200 mg (TDF/FTC), in a daily dosage of one tablet. Both ARVs inhibit the activity of the HIV reverse transcriptase enzyme, reducing the risk of infection by over 90% when used regularly (Grant *et al.*, 2010; Moss *et al.*, 2014). It is a safe and effective method for HIV prevention, with rare adverse events that, when they occur, are brief and clinically manageable (Grangeiro *et al.*, 2015a). Its use can reduce the number of people infected with HIV and, consequently, the high costs that SUS incurs in treating an HIV-positive person (Golub, 2018).

In Brazil, the HIV epidemic is concentrated in specific populations including gay and other men who have sex with men (MSM), transgender individuals, and sex workers. However, even belonging to one of these groups, it is necessary to consider sexual practices and partnerships to characterize frequent exposure to HIV (Brasil, 2018; Kerr, 2009; Szwarcwald *et al.*, 2009). Until August 2022, PrEP was restricted to priority population segments, including gay and other MSM, transgender individuals, and sex workers, meeting one of the following criteria: unprotected sexual

intercourse in the last six months and/or episodes of STIs and/or repeated use of PEP; and serodiscordant partnerships for HIV with sexual intercourse with an HIV-infected individual without a condom (Brasil, 2018).

With the increase in HIV infection among the 15 to 29 age group, particularly those belonging to target populations, Ordinance SCTIE/MS No. 90, dated August 25, 2022, expanded access to these populations through the update of the Clinical Protocol and Therapeutic Guidelines for Pre-Exposure Prophylaxis of HIV Infection Risk (PCDT-PrEP) (Brasil, 2022b). As of August 2022, PrEP is indicated for all sexually active adults and adolescents at increased risk of HIV infection. Prescription can be provided for individuals aged 15 and above, weighing 35 kg or more, without the need for parental presence or authorization (Brasil, 2022c). Within the scope of SUS, aiming to facilitate the expansion of PrEP access in Health Care Networks (RAS), prescription can be provided by medical professionals and nurses. Furthermore, the new update changed the initial PrEP dosage, including a two-tablet TDF/FTC loading dose on the first day, followed by one daily tablet; and modified laboratory follow-ups for prophylaxis (Brasil, 2022c).

Although the indication for PrEP has been expanded, target populations remain a priority. Situations of discrimination, stigma, and prejudice increase their vulnerability to HIV in the same proportion as they increase the need for comprehensive support for these individuals, ensuring their rights to quality health care.

Currently, PrEP is available in 966 dispensing units across Brazil, with 54 located in the state of Rio Grande do Sul (RS) (Painel PrEP, 2024). The city of Santa Maria, located in the central region of the state, has been one of the points of PrEP provision since November 2020. Until August 2022, approximately 200 users accessed PrEP at the municipal medication distribution unit, according to data from the Logistic Control System for Medicines (SICLOM). In the current context, it is extremely important to understand the sociodemographic profile and PrEP usage in the municipality, as it enables the promotion of strategies aimed at integrating less-reached populations into the service. The results contribute to the greater effectiveness of the services provided, enabling, primarily, greater adherence to prophylaxis, which has been a challenge nationwide at this time.

As it is a recent service, there is no overview of access and utilization of PrEP in the city, justifying the objectives of the present study to identify the sociodemographic profile of PrEP users in the city of Santa Maria (RS), quantify the regularity of prophylaxis use and adverse events related to ARVs, evaluate the incidence of STIs and viral hepatitis, and the number of dispensations made by users, in order to identify possible discontinuations/ abandonment of PrEP.

METHODOLOGY

This is an analytical cross-sectional study conducted based on quantitative data available in SICLOM and electronic medical records in the Integrated System of Health Services Management (SSIGS). The project was approved by the Permanent Education Core in Health (NEPeS) and the Research Ethics Committee of the Franciscan University (CEP/UFN) under protocol 5,641,756. Data were collected between September and November 2022 at the Specialized Assistance Service (SAE) and the Testing and Counseling Center (CTA) Casa 13 de Maio, located in the Central region of Santa Maria, RS.

Participants included in the study were adults over 18 years old who withdrew PrEP at least once by August 25, 2022. Initially, candidates for prophylaxis undergo a screening consultation (Brasil, 2018). Within two weeks, they are reassessed to check the results of STI tests, particularly for HIV, and receive a PrEP prescription for 30 days (first dispensation) (Brasil, 2022c). Users without a record of medication withdrawal or who were transferred due to residing in another municipality were excluded from the study.

To determine the PrEP user profile, sociodemographic data (age, race/ethnicity, years of education, region of residence, biological sex, sexual orientation, gender identity, and stable relationship) and PrEP usage data (fitting into the target population, regularity of use, and adverse events) were assessed, as described in Table 1. To evaluate prophylaxis regularity, medical records were reviewed to identify users who did not use the medication for a period of fewer or equal to seven days, more than seven days, and those who did not report treatment failures. Adverse events were analyzed based on user records in medical charts. Additionally, test results for STIs (syphilis, chlamydia, and gonorrhea) and hepatitis B and C were evaluated. Finally, the number of dispensations made by each user was assessed, and based on this, the number and profile of users who discontinued PrEP were outlined. All collected data were recorded in an Excel spreadsheet. Descriptive analysis of participant data was performed to characterize the sample, with categorical variables presented as percentages. Association analysis for qualitative variables was conducted using the chi-square test or Fisher's exact test. Associations were considered significant when results yielded a p-value of <0.05 . IBM SPSS Version 25 software was used as a computational tool for statistical data analysis, where applicable.

RESULTS

From the start of PrEP in the city of Santa Maria (RS) in November 2020 until August 25, 2022, 203 users were registered in SICLOM, of whom seven were transferred due to residing

in other cities and 16 had a registration but did not withdraw prophylaxis. Thus, 180 users were included in the study, and 23 were excluded. Among the 180 PrEP users evaluated, it was possible to establish a sociodemographic profile for the city of Santa Maria: men (93.3%, 168/180), cisgender (87.2%, 157/180), homosexual (68.3%, 123/180), white (72.2%, 130/180), aged between 18 and 24 years (38.3%, 69/180), with ≥ 12 years of education (71.1%, 128/180), without a stable relationship or who chose not to inform (37.7%, 68/180), and residing in the Central region of Santa Maria (47.2%, 85/180) (Table 1). Regarding PrEP usage, it was observed that 78.8% ($n=142/180$) belonged to the population of gay and other MSM, 62.8% ($n=113/180$) were regularly using the medication, and 75.0% ($n=135/180$) reported no adverse events related to PrEP (Table 1).

During PrEP usage, only 2.2% of users (4/180) presented with a non-treponemal VDRL (Venereal Disease Research Laboratory) test and a reactive treponemal FTA-abs (Fluorescent Treponemal Antibody Absorption) test, confirming the diagnosis of syphilis. Twenty-five users (13.8%) reported treated syphilis, as evidenced by a non-reactive VDRL or low titers in the test. Serological scar is the term used for situations in which the individual, proven to be treated, still shows reactivity in tests. In the evaluation of chlamydia and gonorrhea, results were obtained for only 66 PrEP users, with four (4/66, 6.1%) testing positive for *Neisseria gonorrhoeae* and two (2/66, 2%) for *Chlamydia trachomatis*. Testing for chlamydia and gonorrhea was implemented in the city of Santa Maria in 2022 and has not yet been performed on all users, which justifies not obtaining results for all tests. Other infections such as hepatitis B and C were not identified in any of the users.

Table 1 - Sociodemographic profile and use of PrEP in the city of Santa Maria, RS.

CRITERION	DESCRIPTION	RESULT
Age	18 to 24 years	38.3% ($n=69$)
	25 to 29 years	27.8% ($n=50$)
	30 to 39 years	25.0% ($n=45$)
	40 to 49 years	7.8% ($n=14$)
	≥ 50	1.1% ($n=2$)
Race/Ethnicity	White	72.2% ($n=130$)
	“Pardo” *	15.0% ($n=27$)
	Black	12.8% ($n=23$)
Years of Education	≥ 12 years	71.7% ($n=128$)
	8 to 11 years	25.6% ($n=46$)
	4 to 7 years	2.8% ($n=5$)
	1 to 3 years	0.5% ($n=1$)
Region of Residence	Center	47.2% ($n=85$)
	Periphery	26.2% ($n=47$)
	East	23.3% ($n=42$)
	Uninformed	2.2% ($n=4$)
	Other districts	1.1% ($n=2$)

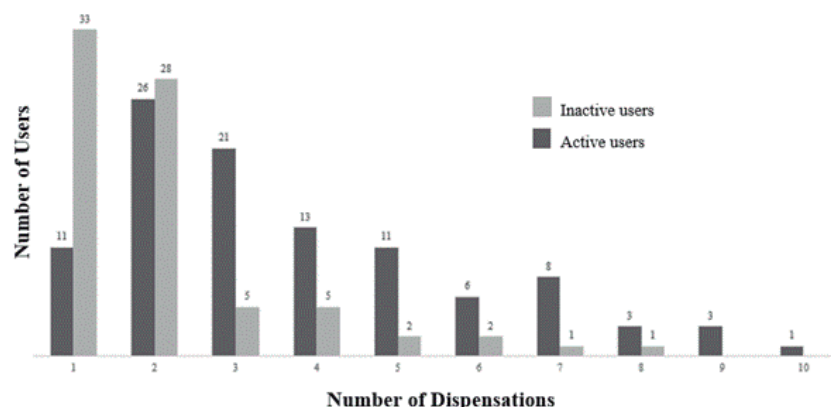
Biological Sex	Masculine	93.3% (n=168)
	Feminine	6.7% (n=12)
Sexual Orientation	Homosexual	68.3% (n=123)
	Heterosexual	17.8% (n=32)
	Bisexual	13.9% (n=25)
Gender Identity	Cisgender man	87.2% (n=157)
	Cisgender woman	6.7% (n=12)
	Transgender woman	5.0% (n=9)
	Non-binary	1.1% (n=2)
Stable Relationship	No	37.8% (n=68)
	Uninformed	37.8% (n=68)
Target Population **	Yes	24.4% (n=44)
	Gay and other men who have sex with men Serodiscordant couple	78.8% (n=142)
	Sex workers	16.1% (n=29)
	Other populations	11.6% (n=21)
	Transgender	5.5% (n=10)
Regularity of Use	Regular use	62.8% (n=113)
	Irregular use for a period of ≤ 7 days	26.6% (n=48)
	Irregular use for a period of > 7 days	10.5% (n=19)
Adverse Events **	Not reported	75.0% (n=135)
	Intestinal disorders	12.2% (n=22)
	Nausea	10.0% (n=18)
	Headache	4.4% (n=8)
	Others	3.3% (n=6)

* “Pardo”: mixture of two or more color/race, including white, black, and indigenous.

** Users can belong to more than one group. Source: Construction of the authors (2024).

Among the 180 users evaluated in the study, 103 (57.3%) were correctly taking PrEP until August 25, 2022 (active users, Figure 1). Seventy-seven users (42.7%) did not return to the service on the scheduled date for prophylaxis withdrawal, indicating that they discontinued PrEP (inactive users, Figure 1). The number of dispensations made by each PrEP user is shown in Figure 1, where it can be observed that among inactive users, 42.8% (n=33/77) and 36.3% (n=28/77) received only one and two dispensations, respectively.

Figure 1 - Number of PrEP dispensations of 103 active and 77 inactive users in the city of Santa Maria, RS.



Source: Construction of the authors (2024).

Analyzing the 77 users who discontinued PrEP (Table 2), it was observed that the sociodemographic profile remains the same among active users (who did not discontinue prophylaxis). They are men, cisgender, homosexual, white, aged between 18 and 24 years, with ≥ 12 years of education, without a stable relationship, residing in the Central region, and belonging to the target population of gay and other MSM. However, comparing the white and black race/ethnicity of active and inactive users, a higher predominance of white users among active users (who continued PrEP) and black users among inactive users (who discontinued PrEP) was observed, with $p = 0.0402$. Additionally, it is noted that almost half of the cisgender women PrEP users ($n=5/12$) and transgender individuals ($n=4/9$) discontinued prophylaxis.

Table 2 - Comparison between the 103 active users and 77 inactive users of PrEP in the city of Santa Maria, RS.

CRITERION	DESCRIPTION	ACTIVE USERS (n = 103)	INACTIVE USERS (n = 77)	p
Age	18 to 24 years	34 (49.2%)	35 (50.8%)	0.2469
	25 to 29 years	32 (64%)	18 (36%)	
	30 to 39 years	25 (55.6%)	20 (44.4%)	
	40 to 49 years	10 (71.4%)	4 (28.6%)	
	≥ 50	2 (100%)	0 (0%)	
Race/Ethnicity	White	79 (60.7%)	51 (39.3%)	0.0711
	“Pardo” *	14 (60.9%)	9 (39.1%)	
	Black	10 (37%)	17 (63%)	
Years of Education	≥ 12 years	75 (58.6%)	53 (41.4%)	0.2975
	8 to 11 years	26 (56.5%)	20 (43.5%)	
	4 to 7 years	1 (20%)	4 (80%)	
	1 to 3 years	1 (100%)	0 (0%)	
Region of Residence	Center	52 (61.1%)	33 (38.9%)	0.5303**
	Periphery	24 (51.1%)	23 (48.2%)	
	East	24 (57.1%)	18 (42.9%)	
	Other districts	1**	1**	
Biological Sex	Masculine	96 (57.1%)	72 (42.9%)	0.8247
	Feminine	7 (58.3%)	5 (41.7%)	
Sexual Orientation	Homosexual	71 (57.7%)	52 (42.3%)	0.5589
	Heterosexual	16 (50%)	16 (50%)	
	Bisexual	16 (64%)	9 (36%)	
Gender Identity	Cisgender man	90 (57.3%)	67 (42.7%)	0.9962
	Cisgender woman	7 (58.3%)	5 (41.7%)	
	Transgender woman	5 (55.6%)	4 (44.4%)	
	Non-binary	1 (50%)	1 (50%)	
Stable Relationship	No	34 (50%)	34 (50%)	0.2213**
	Uninformed	41**	27**	
	Yes	28 (63.6%)	16 (36.4%)	
Target Population	Gay and other MSM Serodiscordant couple	83 (58.5%)	59 (41.5%)	0.3799**
	Sex workers	16 (55.2%)	13 (44.8%)	
	Other populations	8 (38.1%)	13 (61.9%)	
	Transgender	6**	4**	
		5 (55.6%)	4 (44.4%)	

* “Pardo”: mixture of two or more color/race, including white, black, and indigenous. ** The category “other districts” of the region of residence, “not informed” of the fixed relationship and “others” of the target population were not included in the statistical analysis. MSM: men who have sex with men.

DISCUSSION

PrEP is still recent in the city of Santa Maria (RS), and for this reason, lacks data demonstrating the sociodemographic profile and usage of prophylaxis. The present study evaluated 180 users who received at least one dispensation of PrEP since its initiation in the municipality in November 2020 until August 25, 2022. The cut-off date was set due to Ordinance SCTIE/MS No. 90 (Brasil, 2022b), in which, after this date, prophylaxis became indicated for all sexually active adults and adolescents at increased risk of HIV infection. Our study aimed to understand the profile of users using prophylaxis during the mentioned period and whether the priority populations of gay and other MSM, transgender individuals, sex workers, and serodiscordant couples were being reached in the city.

Of the 180 PrEP users evaluated, a predominance of men (93.3%), cisgender individuals (87.2%), homosexuals (68.3%), and those classified in the priority group of gay and other MSM (78.8%) was observed (Table 1). This profile is consistent with the national scenario, where 82.2% of users belong to the group of gay and other MSM (Painel PrEP, 2024). Stigma associated with PrEP, as it involves ARV medication, and the perception that prophylaxis is an “essentially gay” prevention method may limit its acceptance and usage among other target populations (Zucchi *et al.*, 2018).

Nationally and in the city of Santa Maria, the population of cisgender and transgender women, transgender men, and non-binary individuals are a minority among PrEP users (Brasil, 2018; Hoagland *et al.*, 2017). Globally, the transgender women population is most affected by HIV. According to a meta-analysis, conducted with data from 2000 to 2011 from different locations, this group has 49 times higher odds of living with HIV than the general population, with an estimated global prevalence of 19% (Baral *et al.*, 2013; Brasil, 2018). Lack of information about prophylaxis may directly affect the transgender women group. In locations such as San Francisco, Brazil, Chicago, and Boston, it was found that there is low awareness of PrEP among this population (Sevelius *et al.*, 2016a). However, a study showed that despite the limited knowledge about prophylaxis, interest was relatively high when informed about its advantages.

Other issues such as population marginalization, healthcare team unpreparedness in providing care, and negative effects on hormonal therapy can also represent accessibility barriers for the transgender women group (Sevelius *et al.*, 2016b). Additionally, studies demonstrate that the healthcare professionals' stance directly influences the individual's choice to adhere to prophylaxis. Groups with a higher potential for PrEP use tend to have less regularity in healthcare services or not attend them. Thus, healthcare professionals' actions can either be a barrier or facilitate access (Hoagland *et al.*, 2017; Zucchi *et al.*, 2018). A recent study conducted with transgender women demonstrated that stigma and discrimination in the context of healthcare are critical barriers to HIV prevention in

this group, and previous discriminatory experiences in the healthcare setting represented a significant obstacle to accessing PrEP (Jalil *et al.*, 2022).

The sociodemographic profile of PrEP users in the city of Santa Maria (RS) also shows that the majority are young, aged between 18 and 24 years, white, with high levels of education, and residents of the Central region (Table 1). The percentage of young users was higher in Santa Maria compared to the national territory, which presents only 8.9% of PrEP users in the age group of 18 to 24 years (Painel PrEP, 2024). Although PrEP is more widespread among the young population, HIV infection has been increasing in the age group of 15 to 29 years, especially among individuals belonging to the target populations (Brasil, 2022b). Initially, in Brazil, PrEP was directed towards priority populations, which usually reside in the outskirts of cities (Polidoro *et al.*, 2020). The findings of this study demonstrate that the dispensation of prophylaxis mainly occurs for people residing in the Central region (40.5%) and not in peripheral regions. It is worth noting that decentralization of services offering prophylaxis is of utmost importance to reach all users, facilitating access and strengthening the adherence of the socioeconomically vulnerable population (Polidoro *et al.*, 2020).

High levels of education among PrEP users can be observed in Santa Maria and in Brazil, as well as in other countries. In the clinical trial iPrEx, conducted in eleven different locations, 79% (1,729/2,205) of participants had completed high school, with only 21% (452/2,205) having lower levels of education (Marcus *et al.*, 2013). However, regarding race/ethnicity, Brazil presents a more heterogeneous population compared to the open-label PROUD trial (2016) conducted in England, where only 4% (11/273) were Black (McCormack *et al.*, 2016). In the city of Santa Maria (RS), the percentage of PrEP users who identify as Black (15%) is similar to the national territory, where 13% self-identify as Black (Painel PrEP, 2024). The Black population, with lower levels of education, and residents of peripheral regions represent a smaller percentage among PrEP users, which may result from unawareness about PrEP, greater difficulties in accessing healthcare services, and the absence of strategies targeting this population (Zucchi *et al.*, 2018; Jalil *et al.*, 2022).

Regarding stable relationships, 37.7% of PrEP users did not have one, and the same percentage chose not to report their sexual partnerships (Table 1). Interestingly, 24.4% of users claimed to have a stable relationship, but only 16.1% mentioned having a serodiscordant partnership. These data support the study by Shamu *et al.* (2021), which, although multiple sexual partners are a risk factor for HIV infection, individuals in a stable relationship can also be exposed to the virus. This underscores the need to disseminate combined prevention strategies in combating HIV and other STIs (Ayerdi *et al.*, 2019). Since 2012, the World Health Organization (WHO) has recommended the implementation of projects to demonstrate the safety, effectiveness, applicability, and sustainability of PrEP in serodiscordant couples (Hallal *et al.*, 2015). In the Partners PrEP study, prophylaxis proved effective in heterosexual serodiscordant partnerships, with an overall 75% reduction in the

risk of HIV infection (Murnane *et al.*, 2013). PrEP is used as a complementary form of prevention by the HIV-negative person, providing them with autonomy and security, especially in cases such as multiple partnerships or frequent reports of sexual intercourse without condom use and for family planning of these couples (Brasil, 2022b).

The effectiveness of PrEP is directly related to the degree of adherence to prophylaxis. In the iPrEx study, the reduction in HIV incidence was greater than 90% in individuals with detectable blood levels of antiretrovirals (Grant *et al.*, 2014). In the municipality of Santa Maria (RS), among the 180 PrEP users, 37.2% reported some failure during use, with 26.6% for a period of less than seven days (Table 1). According to Grant *et al.* (2014), these failures would not affect the effectiveness of prophylaxis, since PrEP has been shown to be highly effective with 4 doses per week. A small portion of PrEP users (10.5%) in the city of Santa Maria (RS) reported failures for a period longer than seven days, which may have led to lower efficacy in preventing HIV infection. It was observed that the majority of interruptions occurred among users who did not pick up the prophylaxis in a timely manner to maintain regular use. However, adherence failures were not related to discontinuation of PrEP, as 74% of users who reported failures continued to use prophylaxis.

Studies evaluating user adherence to PrEP present divergent results, depending on the population evaluated. The FEM-PrEP study, conducted with African women, identified a risk reduction rate for HIV infection of only 6% (Lut Van Damme *et al.*, 2012; Marrazzo *et al.*, 2013). In contrast, the “Combina!” and PrEP-Brazil studies demonstrated good adherence rates to prophylaxis. In “Combina!”, it was observed that, in the first semester of PrEP use, 75% of users picked up the medication on time to maintain their regular use. The PrEP-Brazil study demonstrated adherence rates close to 80% among gay and other MSM and transgender women (Grangeiro *et al.*, 2015b; Hoagland *et al.*, 2017). Adherence failures to PrEP may be related to greater social vulnerability, misinformation about the need for regular use of prophylaxis, and the absence of risk perception among users, highlighting the need for strategies that increase users’ connection with the service and identify those with greater difficulty adhering to prophylaxis (Hoagland *et al.*, 2017; Zucchi *et al.*, 2018).

Adverse events related to PrEP are poorly documented. In Santa Maria (RS), 75% of users did not report symptoms related to prophylaxis. Among the few reported adverse events, gastrointestinal disorders and nausea stand out, which corroborate with other studies reporting these manifestations, especially in the first four weeks of use (Brasil, 2022b; Brasil, 2022c; Grant *et al.*, 2010; Hoagland *et al.*, 2017; Liu *et al.*, 2016). In the PROUD study, an open-label trial conducted with gay and other MSM, 5% of PrEP users discontinued the medication due to adverse events such as nausea, headache, and joint pain (McCormack *et al.*, 2016). In our study, only one report of prophylaxis interruption (<1%) due to adverse events was observed (data not shown).

For the initial screening and clinical monitoring of PrEP users, tests for HIV (a prerequisite for adherence to prophylaxis) and other STIs (syphilis, chlamydia, gonorrhea) and hepatitis B and C are performed (Brasil, 2018). Positive results for Hepatitis B and C were not evidenced; however, four cases of syphilis, four cases of gonorrhea, and two cases of chlamydia were detected during the clinical follow-up of users. All cases of STIs belonged to the MSM group. It is discussed that PrEP could cause a disinhibition effect on sexual practices, reducing condom use and consequently making these users more susceptible to other STIs (Pines *et al.*, 2020; Roth *et al.*, 2021; Zucchi *et al.*, 2018). A study conducted in Austria between 2016 and 2018 did not indicate a significant difference, only a slight increase in syphilis cases among gay and other MSM using PrEP (McManus *et al.*, 2020). On the other hand, PrEP has been associated with a 72% increase in cases of chlamydia, gonococcus, syphilis, and hepatitis C in the city of Montreal, Canada (Nguyen *et al.*, 2018). Roth *et al.* (2021) found that a higher number of sexual partners is related to a higher incidence of syphilis, as participants who tested positive had a higher average of sexual partners in the last 12 months. Considering the heterogeneity of results found in the literature and those obtained in this study, it is evident that the use of prophylaxis can influence users' sexual behavior, but the impact this has on STI incidence is still uncertain and may vary depending on the location (Ramchandani; Golden, 2019).

Continuous evaluation of STI outcomes in PrEP users seems to deserve attention, especially to monitor infection rates in different populations and the need for strategies aimed at raising awareness about the use of combination prevention (condoms, among others). It is essential for healthcare professionals prescribing prophylaxis to reflect on the need for better understanding among users of the specificity of PrEP in combating HIV infection; it does not have efficacy in controlling other infections.

Linked to users' knowledge about PrEP is the question about the high number of users who discontinued prophylaxis (42.7%) in the city of Santa Maria (RS). This result is higher than the national scenario, where out of 112,547 individuals who started PrEP, 33.3% (37,621) discontinued its use (Painel PrEP, 2024). A systematic review shows that among the reasons for users discontinuing PrEP are geographical factors, stigma, and low perception of HIV infection risk (Sullivan *et al.*, 2019). When analyzing these factors, it is noted that they may be closely associated with the reality of the city of Santa Maria (RS), since until August 2022, access to PrEP was only available in a single healthcare facility located in the city center. Stigma and low perception of risk are factors that need to be analyzed in the studied population to investigate if they are indeed contributing to the abandonment of prophylaxis.

According to Sullivan *et al.* (2019), one of the factors that most influenced users to discontinue PrEP was the high cost of going to the health unit for follow-up appointments and to pick up the medication. Calabrese (2020) demonstrated that stigma against PrEP users has received increasing

attention as a critical factor that undermines interest, acceptance, and continuity of prophylaxis. Studies show frequent reports from users about negative feelings when attending the health unit to pick up the medication, due to stereotypes or beliefs that PrEP is associated with people with HIV and the homosexual population (Golub, 2018; Sullivan *et al.*, 2019). Therefore, it is necessary to keep a close eye on the factors that are causing PrEP users to discontinue its use.

Furthermore, the results of the present study demonstrate that the Black, heterosexual, and low-educated population are minorities among PrEP users in the municipality of Santa Maria (RS). Comparing the white and Black race/color of active and inactive users, there was a greater predominance of white users among the active (who continued PrEP) and Black users among the inactive (who discontinued PrEP) (Table 2). An analysis conducted in the United States, between 2016 and 2019, evaluated PrEP discontinuation at pharmacies nationwide, showing that out of 241,965 people with a PrEP prescription, a total of 20,535 (8.5%) had not picked up their prescription. It was observed that discontinuation was higher among older individuals (≥ 65), Black individuals, and women. Studies by Grinsztejn *et al.* (2017) and Jalil *et al.* (2022) also showed that Black participants tended to have low adherence to PrEP. The combination of transphobic experiences, racism, and discrimination puts populations at higher vulnerability to HIV and has a negative impact on healthcare and PrEP adherence (Sevelius, 2013; Jalil *et al.*, 2022).

CONCLUSION

The sociodemographic profile of PrEP users in the city of Santa Maria (RS) was men, cis-gender, homosexual, white, aged 18 to 24 years, education ≥ 12 years, without a fixed relationship, and residing in the Central region. Regarding PrEP use, there was a greater alignment with the population of gay and other men who have sex with men. Other key-priority groups, such as sex workers, serodiscordant couples, and transgender individuals, seem to not be accessing prophylaxis. Out of the 180 users analyzed, 42.7% discontinued its use, demonstrating a high rate of PrEP abandonment in the municipality. In addition, few adverse events and a low incidence of STIs were observed. The results reinforce the need for strategies aimed at reaching the population most vulnerable to HIV infection in the city of Santa Maria (RS) and understanding the factors that lead to its discontinuation.

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