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## Pre-exposure prophylaxis as prevention strategy in the HIV transmission: characterization of the user

Profilaxia pré-exposição como estratégia de prevenção na transmissão do HIV: caracterização do usuário  
Profilaxis previa a la exposición como estrategia de prevención de la transmisión del HIV: caracterización de los usuarios

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### ABSTRACT

**Introduction:** The combined HIV prevention is the current strategy of prevention employed in coping with this disease. It makes combined use of biomedical, behavioral and structural interventions, applied at the level of individuals. This study aimed to characterize the user of PrEP of a hospital of Minas Gerais and his relationship with this proposal. **Outline:** Descriptive study based on secondary data, with a quantitative approach, carried out in 2020. To obtain the data, information available by the service itself, in the prophylactic care of users, was used. **Results:** Of the 80 users analyzed, 41.3% were between 22 and 30 years old, 86.3% were single and 80% considered themselves homosexuals, 37.5% claimed to have had a relationship with HIV+ people without using condoms, 100% of users underwent rapid testing for HIV. **Implications:** The findings demonstrate that PrEP has significantly contributed to HIV prevention. However, given the risk behavior of many users, there is a need for managers and health professionals to improve this intervention.

### DESCRIPTORS

Medication Adherence; HIV; Patients; Pre-Exposure Prophylaxis.

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## INTRODUCTION

The Human Immunodeficiency virus (HIV) remains, nowadays, being considered one of the most worrisome problems for worldwide public health, considering the huge growing and dissemination of the infection in the population of all ages and genders.<sup>1</sup> According with the 2018 epidemiological bulletin of Brazilian Ministry of Health, from 1980 to June 2018, 926,742 new cases of AIDS were identified in Brazil. The country has been recording, annually, an average of 40 thousand new AIDS cases in the last five years.<sup>2</sup>

Prevention strategies have always been essential in the Brazilian response to the epidemic of HIV and AIDS.<sup>3</sup> It is with humanized educational preventive actions that Brazilian public policies have been developing, for years, the work of prevention and reduction of transmissibility of HIV in the Brazilian population. Reducing the rates of the disease requires the strategies of HIV prevention to be improved, considering the already obtained experiences with theoretical presuppositions and the new prevention technologies arisen in the last years, specially those articulated from the use of antiretrovirals (ARV). This set of technologies, when associated and combined with interventions of HIV/Aids prevention, serve as a foundation for the latest prevention model, named "HIV Combined Prevention", proposed by the Brazilian Ministry of Health.<sup>4</sup>

The Pre-Exposure Prophylaxis is part of the Strategies of HIV Combined Prevention, of which are also parts: HIV Testing; HIV Post-Exposure Prophylaxis (PEP); regular use of condoms; timely diagnosis and adequate treatment of sexually transmitted infection; Damage reduction, Management of Vulnerabilities; Suppression of viral replication through the ARV treatment; and Immunizations. The PrEP consists of the daily use of oral ARV by uninfected people in order to reduce the risk of

acquiring the infection.<sup>2</sup> The strategy of the prophylaxis occurs through the utilization of a daily pill composed of two drugs, Tenofovir and Emtricitabine, making a blocking on HIV multiplication to happen.<sup>4</sup>

The scientific evidence demonstrated by new researches portray that the use of PrEP reduces the risk of HIV infection by more than 90%. The effectiveness and the security of PrEP can be verified in several clinical studies and population segments and its effectiveness was highlighted in demonstration studies.<sup>5</sup> The primordial results of the recent studies which gave impulse to the proposal of the PrEP as HIV prevention tool indicate that its effectiveness is strongly correlated to the adherence in partakers with detectable levels of the drug in their blood.<sup>6</sup>

In order to indicate the use of PrEP, it is necessary to assess the exposition risk due the adopted sexual practices, vulnerability contexts, population with higher rates of HIV prevalence and the sexual partnerships. It is in this context that PrEP associates with an additional and new prevention strategy in the Unified Health System (SUS), aiming to reduce HIV transmission and to collaborate for the achievement of the goals related to the end of the epidemic. However, so this strategy can be accomplished, it is necessary the healthcare network to eliminate the access barriers to these populations, supporting them on their wholesome and ensuring their rights to a quality health system.<sup>2</sup>

In view of all the problems regarding Aids, its diagnosis and treatment, and considering that the PrEP will be a new alternative for those who felt difficulty in adhering to the traditional prevention methods, it becomes relevant to enhance the knowledge on user's profile and his adhesion to this therapy, as well as the contribution to improve the quality of life of the risk populations. It is highlighted that studies on this subject matter are scarce.

Stimulating the adherence to PrEP may reduce population's access barrier, once the verification of the quality and expansion of the therapy for another health services can contribute for reducing HIV transmission. Thus, the present article aims to characterize of PrEP's user of a hospital of Minas Gerais e its relationship with this proposal.

## METHOD

It is a descriptive study based on secondary data, with a quantitative approach, carried out in a public hospital in Minas Gerais, from May to September 2020.

Data collection was carried out on days and times planned, which were authorized and scheduled by the service. The data were organized in Microsoft Excel 2019 and were descriptively analyzed. Although the data were secondary, they were not from public domain. That being so, the research was underwent and approved by the Ethics Committee in Research of the State University of Minas Gerais in Divinópolis (UEMG/Divinópolis) under the technical advice n. ° 3.920.074 and by the Hospital Foundation of the State of Minas Gerais under the technical advice n. ° 3.997.291.

The hospital is a reference in the specialized healthcare in Infectious Diseases, in research and training of health professionals. The outpatient clinic performs an important role as part of the Program of Adequate Integration of the STI/HIV/Aids Carrier of the Brazilian Ministry of Health as a Specialized Assistance Service (SAE). The service for PrEP is did since 2018, on-demand, twice a week. On average, 10 patients are served per day. The choice of the hospital to carry out the work was due the fact the hospital already has the PrEP protocol implemented and in operation for patients interested in the prophylaxis method.

For data obtaining, it was utilized a database already in use by the service itself in the prophylactic

service for controlling the dispensation of drugs and user's frequency in appointments. The information made available by the hospital did not contain any datum which could identify these people. Due pandemic of COVID-19, the researchers had no contact with the users.

Information about users joined to the service from 2018 to 2020, over 18 years old, of all genders, who already had started the drug and who had complete care reports, were eligible for the study. Initially, information referring to 93 users was found, information about 13 users were excluded for not presenting complete information in the database. Thus, information from 80 users was analyzed.

For the data analysis, the following variables were considered: age, marital status (either sexual partner or affective bond), homeless, educational attainment, incomes, sexual orientation, gender identity, race/color, exposure to HIV in the last 72 hours before the appointment, sexual relationship without the use of condoms with a HIV+ partners, amount of partners in the last 3 months, frequency of condom use in the last 6 months, kind of sexual relationship without condom use in the last 6 months, number of users who accepted some sort of payment for sex, number of PrEP uses in the last 12 months, motivation to seek the PrEP, previous PrEP use, occurrence of adverse effects to PrEP medication, occurrence of malaise or discomfort related to PrEP, number of users who have ever stopped taking PrEP pills, reason for not taking the medicament, number of PrEP pills did not take in the last 30 days, PrEP users who had already used injectable dopes, substances used in the last 3 months, carried out fast HIV test and vaccinal status for Hepatitis B.

## RESULTS

From the 80 selected users, 33 (41.3 %) are in the age range 22 to 30 years old and 69 (86.3%) are single. Homeless people were not found. As to the

sexual orientation, 64 (80%) are homosexual, as to the gender identity, the prevalence, 67 (83.8%), was men. Regarding to the race/color, 46 (57.5%) consider

themselves pardo (mixed-race). Most has at least 12 years or above of formal education, and 59 (73.7%) have formal job (Table 1).

**Table 1** – Socioeconomic characteristics of the PrEP users of a public hospital of Minas Gerais, 2018-2020.

Socioeconomic characteristics	N	%
<b>Age</b>		
22-30	33	41.3
31-40	31	38.7
41-50	12	15.0
52-56	2	2.5
64-68	2	2.5
<b>Marital Status</b>		
Single	69	86.3
Married	4	5.0
Divorced	3	3.8
Widowed	1	1.2
Stable Union	3	3.7
<b>Homeless person</b>		
Yes	0	0
No	80	100
<b>Sexual orientation</b>		
Straight	10	12.5
Homosexual/gay/lesbian	64	80.0
Bisexual	6	7.5
<b>Gender identity</b>		
Woman	10	12.5
Man	67	83.8
Transsexual woman	3	3.7
Transvestite woman	0	0
<b>Race/ Color</b>		
Caucasian	28	35.0
Black	5	6.3
Yellow	0	0
Pardo	46	57.5
Indian	0	0
Not declared	1	1.2
<b>Educational attainment</b>		
None/ without formal education	0	0
From 1 to 3 years	0	0
From 4 to 7 years	2	2.5
From 8 to 11 years	29	36.2
12 years or above	45	56.3
Not declared	4	5.0
<b>Formal income</b>		
Yes	59	73.7
No	14	17.6
Not declared	7	8.7

Source: Direct search.

Table 2 shows that 72 (90%) PrEP users have already had some sort of exposure to HIV, that 30 (37.5%) prophylaxis' users have already had sex without a condom with HIV+ partners, and that 63 (78.7%) are men who have sex with men. On the frequency of use of condoms, 27 (33.8%) claim to have used more than half of the times in their sexual relations. The most predominant sort of sexual

relation was the insertive anal one (to penetrate the anus) and receptive anal one (to be penetrate in the anus), which corresponds to 47 (58.8%). Among the 80 PrEP users, 68 (85.0%) never accepted money, valuables, drugs, housing or service as exchange for sex.

**Table 2** – Characterization of the sexual behavior of users of a public hospital of Minas Gerais, 2018 - 2020.

Characteristics of the Sexual Behavior	N	%
<b>Exposure to HIV in the 72 hours before the appointment</b>		
Yes	8	10.0
No	72	90.0
<b>Sexual relation without condom with HIV+ partners</b>		
Yes	30	37.5
No	11	13.7
Doesn't know	29	36.3
Not applicable	10	12.5
<b>Number of partners in the last 3 months</b>		
Men who have sex only with men	63	78.7
Men who have sex with both men and women	3	3.8
Men who have sex with both men and transvestite	1	1.2
Men who have only with women	10	12.5
Transgender women who have sex only with men	3	3.8
<b>Frequency of condom use in the last 6 months</b>		
Not once	10	12.5
Less than half the time	13	16.3
Half the time	7	8.7
More than half the time	27	33.8
Every time	23	28.7
<b>Sort of sexual relation without condom in the last 6 months</b>		
Insertive anal (to penetrate the anus)	10	12.5
Receptive anal (to be penetrated in the anus)	10	12.5
Insertive vaginal (to penetrate the vagina)	2	2.5
Receptive vaginal (to be penetrated in the vagina)	6	7.5
Insertive anal + receptive anal	47	58.8
Insertive anal + receptive anal + insertive vaginal	2	2.5
Receptive anal + receptive vaginal	2	2.5
Not applicable	1	1.2
<b>Number of users who have already accepted money, valuables, drugs, housing or services as exchange for sex</b>		
Yes	12	15.0
No	68	85.0

Source: Direct search.

Among the 80 users of the prophylaxis, 46 (57.5%) reported not having used the PrEP in the last 12 months, 39 (48.8%) were encouraged to seek the PrEP method by either other health professionals or health service, 39 (48.8%) by media and 74 (92.5%) users had never used it before. Regarding the adverse effects medications may cause, 75 (93.7%) users did not present none of those, as to the occurrence of

malaise or discomfort related to PrEP, 17 (21.3%) presented some sort of discomfort. In relation to treatment's adhesion, 55 (68.8%) users never stopped taking the drugs and the ones reported have forgotten, 25 (31.2%), the main reason was for either forgetting or ending the medication, both reported by 11 (13.7%) users, respectively (Table 3).

**Table 3** – Description of PrEP use of a public hospital of Minas Gerais, 2018 – 2020.

Use of PrEP	N	%
<b>Number of PrEP uses in the last 12 months</b>		
0	46	57.5
1 to 5	31	38.8
6 to 10	2	2.5
Over 10	1	1.2
<b>Motivation to seek PrEP</b>		
Health professional/another service	39	48.8
Media/ internet/ friend	39	48.8
Non-governmental Organization	1	1.2
Out of touch	1	1.2
<b>Previous use of PrEP</b>		
Yes	4	5.0
No	74	92.5

Out of touch	2	2.5
<b>Occurrence of adverse effects to the PrEP medication</b>		
Yes	5	6.3
No	75	93.7
<b>Occurrence of malaise or discomfort relating to PrEP</b>		
Yes	17	21.3
No	63	78.7
<b>Type of discomfort or malaise related to PrEP</b>		
Intestinal	5	6.3
Abdominal	8	10.0
Abdominal e intestinal	2	2.5
Other	4	5.0
There was no discomfort or malaise	63	78.7
<b>Users who have stopped taking PrEP pills at any time</b>		
Yes	25	31.2
No	55	68.8
<b>Reason for not taking the medication</b>		
Oblivion	11	13.7
Travel	3	3.8
Finished the drug	11	13.7
did not stop taking	55	68.8
<b>Number of PrEP pills left to take in the last 30 days</b>		
1 to 10	18	22.5
11 to 20	1	1.2
21 to 30	6	7.5
did not stop taking	55	68.8

Source: Direct search.

Table 4 demonstrates that, as to the risk behavior for the HIV, 75 (93.8%) PrEP users never used injectable drugs and three (3.7%) have already used

injectable drugs. Among the ones who have already used illicit substances, 15 (18.8%) have used of two or more sorts of drugs (Table 4).

**Table 4** – Description of the risk behavior for HIV of the PrEP users of a public hospital of Minas Gerais, 2018 - 2020.

Risk behavior for HIV	N	%
<b>PrEP users who have already used injectable drugs</b>		
Yes	3	3.7
No	75	93.8
Out of touch	2	2.5
<b>Substances used in the last three months</b>		
Poppers	1	1.2
Cocaine	3	3.8
Crack	0	0
Pot	7	8.7
Club Drugs	1	1.2
Erectile dysfunction medications	5	6.3
Solvent	0	0
2 or more types of drugs	15	18.8
None	48	60

Source: Direct search.

Among the preventive behaviors for protection against HIV, rapid test was carried out in all users of the prophylaxis before they start the treatment and

80 (100%) users had non-reactive as result for the test. As to the immunization for Hepatitis B, 55 (68.8%) of the people had all doses (Table 5).

**Table 5** – Description of preventive behavior for HIV of the users of PrEP of a public hospital of Minas Gerais, 2018 – 2020.

Preventive behavior for HIV	N	%
<b>HIV rapid test</b>		
Reactive	0	0
Non-reactive	80	100
<b>Hepatitis B Vaccination</b>		
Full schedule	55	68.8

Been headed for vaccination	14	17.5
Not performed	3	3.7
Out of touch	8	10

Fonte: Pesquisa direta.

## DISCUSSION

It is noticeable, currently, that the aggravation caused by HIV infection and consequently by AIDS, affects indiscriminately all population groups. However, studies indicate that some population strata, called key populations, have specific vulnerabilities, such as sexual orientation, discrimination, stigma, difficulty in accessing education and health services, as well as having sexual practices that put them in risk situation,<sup>7-8</sup> having this worsening gained prominence in the last few years due the higher occurrence rate among teenagers and young ones.<sup>8-9</sup>

The vulnerabilities imposed over the key populations strengthen the recommendation for PrEP use by these strata, which encompass men who have sex with men, gays, transgender people, people who uses alcohol and other drugs, people deprived of liberty and professionals of sex.<sup>5</sup> Such reality corroborates the founds of this study, where most of the users of the prophylaxis is homoaffective and most of these is teenager/young and who use drugs, highlighting that the social vulnerabilities correlate with the profile of PrEP user, moreover, these results corroborate with founds of other studies which also found such characteristics of the users.<sup>8-11</sup>

Some lifestyles, as the use of drugs and, specifically, risky sexual practices, a little more evident in key populations, potentiate the possibility of being infected with the virus, as well as to get other sexually transmitted infection.<sup>8-12</sup> In this way, the option for the use of PrEP also associates with the high perception of the risk of HIV infection, awakening the interest by the adoption of the prophylaxis.<sup>11</sup> The founds of this study illustrate this context, indicating that most of the users already had

some exposure to HIV and, still, a significant parcel of these users already had sexual relations with HIV+ partners, without the use of condoms, demonstrating a seek by the prophylactic alternative as response to their risky practices. However, a large portion of PrEP users analyzed in this study reported never having used injecting drugs, an aspect that contrasts with literature data.<sup>11-12</sup>

Studies which analyzed PrEP effectiveness as prevention tool of HIV infection demonstrate high protective levels against the viral infection, with rates ranging from 73% to 85%, and indicate that its effectiveness is strongly attached to the adhesion of it.<sup>13-14</sup> In this study, the frequency of use of condoms during sexual practices indicates an alarming datum, evidencing that only a little part of the users made use of it in all sexual relations. This occurrence may be associated with the false perception of a lower chance of contracting HIV among users who use PrEP.<sup>15,12</sup> Thus, this datum raises questions about the sexual practices of the users of this study associated with the sense of confidence in the prophylaxis and corroborates with other studies which also identified risky sexual behaviors among PrEP users.<sup>16-17</sup>

The adhesion to the PrEP is determining for its effectivity. Data collected by the Brazilian Ministry of Health indicated a 20% loss of users who started the prophylaxis due lack of follow-up.<sup>2</sup> It is highlighted that a higher social vulnerability can negatively influence in the adhesion to the prophylaxis, as well as the access conditions or inadequacy of the services that offer it.<sup>18-19</sup> Studies, national and international, address that sexual orientation, gender identity, age, especially young people, a lower socioeconomic level, as well as the black race, are conditions that predispose to non-adherence to prophylaxis.<sup>16,18,20</sup> This conformation validates the findings of this study,



whose user profile is similar to the studies mentioned above, showing a low rate of non-adherence to PrEP.

Beyond the adhesion, which is extremely necessary for PrEP effectiveness, the adoption of safe lifestyles and behaviors and the disclosure of the prophylaxis for the key populations are also extremely relevant.<sup>19</sup> All analyzed users in this study tested negative to the rapid tests before they started the treatment, besides of most showing a full vaccination schedule for hepatitis B. It is emphasized that prophylaxis' implementation, through the accompanying of the users during medications' use, as well as the reinforcement of complementary strategies, as the use of condoms, rapid tests, vaccination, among others, are factors that contribute for the reduction of HIV transmission and, consequently, cooperation for the control of the HIV/AIDS epidemic.

A challenge for the full implementation, and consequent effectiveness of PrEP, is the transposition of the knowledge demonstrated in the studies for the reality of the health services which offer it, as well to the key populations.<sup>15-19</sup> This study demonstrates that about 48.8% of the prophylaxis' users were motivated by professionals of health, an equal percentage was observed for those who were motivated by the media. In this sense, the role of the health professional, mainly the ones of Nursing, in the identification and counseling, a wide disclosure, as well as articulation of programmatic actions developed by the health services are extremely potential for the wide incorporation of PrEP and its consequent effectiveness.

The PrEP is an additional HIV infection prevention strategy available in the Unified Health System (SUS), being an important public health tool. However, for it to materialize as such and achieve its goal, it is necessary, for beyond of its availability in the specialized services, to know the profile of the users of this prophylaxis, as well as their adhesion to it, exacting to survey for factors influencing its use or

not, in addition to the quality of life of key populations that benefit from PrEP.

A limitation of this study is the lack on variables' standard for the screening of low adhesion risks as: treatment's access barriers, HPV vaccination coverage, use of other combinations of available preventions. Therefore, the limitation could be mitigated with the inclusion of elements such as: difficulties in acquiring medication, reason for absence from medical appointments, access to the treatment site, barriers to access to Hepatitis B and HPV vaccines and use of other forms of prevention of sexually transmitted infections.

## CONCLUSION

It was evidenced that, in a general way, prophylaxis' users are male, young adults, single, brown, with more than 10 years of education and with formal income. Half of users were motivated by health professionals or the media, and most had never used PrEP before.

It was possible to notice that, although many users adopt mechanisms to prevent sexually transmitted infections, they still have behaviors and lifestyles that put them at risk. This fact demonstrates that proper follow-up of these users by health professionals is essential during prophylaxis, in order to emphasize the relevance of PrEP in the control of the HIV/AIDS epidemic.

Furthermore, the findings demonstrate that PrEP has significantly contributed to HIV prevention. However, given the risk behavior of many users, it is understood the need for managers and health professionals to improve this intervention, whether in specialized assistance to users, research or training of new professionals.

It is suggested to carry out further studies on prophylaxis, highlighting the need to analyze the perception of users about it and a possible evaluation of the implementation of this intervention.



## RESUMO

**Introdução:** A Prevenção Combinada do HIV é a atual estratégia de prevenção usada no enfrentamento dessa doença. Faz uso combinado de intervenções biomédicas, comportamentais e estruturais aplicadas ao nível dos indivíduos. Este estudo teve por objetivo caracterizar o usuário da PrEP de um hospital de Minas Gerais e sua relação com essa proposta. **Delineamento:** Estudo descritivo, com abordagem quantitativa, baseado em dados secundários, realizado no ano de 2020. Para a obtenção dos dados foram utilizadas informações disponíveis pelo próprio serviço, no atendimento profilático aos usuários. **Resultados:** Dos 80 usuários analisados, 41,3% tinham de 22 a 30 anos, 86,3% eram solteiros e que 80% se consideravam homossexuais, 37,5% afirmam já ter se relacionado com pessoas HIV+ sem fazer o uso de preservativo, 100% dos usuários realizaram o teste rápido para o HIV. **Implicações:** Os achados demonstram que a PrEP tem contribuído significativamente para a prevenção do HIV. Contudo, diante do comportamento de risco de vários usuários, entende-se a necessidade de gestores e profissionais de saúde aprimorarem essa intervenção.

## DESCRITORES

Adesão à medicação; HIV; Pacientes; Profilaxia Pré-Exposição.

## RESUMEN

**Introducción:** La Prevención Combinada del VIH es la estrategia de prevención actual para hacer frente a esta enfermedad. Hace uso combinado de intervenciones biomédicas, conductuales y estructurales aplicadas a nivel individual. Este estudio tuvo como objetivo caracterizar al usuario de PrEP en un hospital de Minas Gerais y su relación con esta propuesta. **Delineación:** Estudio descriptivo, con enfoque cuantitativo, basado en datos secundarios, realizado en el año 2020. Para la obtención de los datos se utilizó la información disponible del propio servicio, en atención profiláctica a los usuarios. **Resultados:** De los 80 usuarios analizados, el 41,3% tenían entre 22 y 30 años, el 86,3% eran solteros y el 80% se consideraban homosexuales, el 37,5% afirma haber tenido relaciones con personas VIH+ sin usar preservativo, el 100% de los usuarios realizó la prueba rápida de VIH. **Implicaciones:** Los hallazgos demuestran que la PrEP ha contribuido significativamente a la prevención del VIH. Sin embargo, dado el comportamiento de riesgo de varios usuarios, se entiende la necesidad de que los gestores y profesionales de la salud mejoren esta intervención.

## DESCRIPTORES

Cumplimiento de la Medicación; HIV; Pacientes; Profilaxis Pre-Exposición.

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## COLLABORATIONS

NCRS: substantial contributions in work's conception or design; in the collection, analysis and interpretation of data; in the writing of the article or in its critical review; in the final version to be published. MAF: substantial contributions in work's conception or design; in the collection, analysis and interpretation of data; in the writing of the article or in its critical review; in the final version to be published. HSA: substantial contributions in work's conception or design; in the collection, analysis and interpretation of data; in the writing of the article or in its critical review; in the final version to be published. LDP: substantial contributions in work's conception or design; in the collection, analysis and interpretation of data; in the writing of the article or in its critical review; in the final version to be published. All authors agree and are responsible for the content of this version of the manuscript to be published.

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**CONFLICTS OF INTEREST**

There are no conflicts of interest to declare.