

Unwillingness to prescribe PrEP by health care professionals of specialized HIV/AIDS services in Northeastern Brazil

Disposição para oferta de PrEP por profissionais de saúde de serviços especializados em HIV/aids no Nordeste do Brasil

Resistencia de los profesionales de la salud de los servicios especializados en VIH/SIDA a indicar la PrEP en el Nordeste de Brasil

Juliana de Souza Lamônica ^{1,2}
Laio Magno ^{2,3}
Julia Elen Jesus da Silva Santos ³
Ines Dourado ²
Adriano Maia dos Santos ^{4,5}
Marcos Pereira ²

doi: 10.1590/0102-311XEN121322

Abstract

This study aimed to analyze factors associated with the unwillingness to prescribe pre-exposure prophylaxis (PrEP) by health care professionals of specialized HIV/AIDS services. This is a cross-sectional study with 252 health care professionals in 29 specialized care services (SCSs) in HIV/AIDS in 21 municipalities in the state of Bahia, Brazil. The inclusion criterion was that the professional had worked for at least six months in the service. Sociodemographic, occupational, and behavioral data were collected using a questionnaire. Logistic regression was performed with an estimation of crude and adjusted odds ratio (OR) and respective 95% confidence intervals (95%CI). The unwillingness to prescribe PrEP was 15.2% (95%CI: 10.8-19.6). The factors associated with unwillingness to prescribe PrEP were non-prescription of HIV self-tests for key populations ($_{adjusted}OR = 5.4$; 95%CI: 1.3-22.4) nor post-exposure prophylaxis ($_{adjusted}OR = 2.00$; 95%CI: 1.3-3.1), location of the SCS in the state capital ($_{adjusted}OR = 3.9$; 95%CI: 1.4-10.2), and SCSs without PrEP offer ($_{adjusted}OR = 1.7$; 95%CI: 1.1-2.8); professionals who have not reported the need to conduct training and courses ($_{adjusted}OR = 1.3$; 95%CI: 1.1-1.8), or training with more experienced professionals ($_{adjusted}OR = 1.8$; 95%CI: 1.1-3.8), was associated with a lower proportion of unwillingness to prescribe PrEP. Our results indicate that health care professionals' contextual, organizational, and training factors can contribute to PrEP indication. We suggest expanding ongoing training in combined HIV prevention among health care professionals and increasing the availability of PrEP in health services.

Pre-Exposure Prophylaxis; Attitude of Health Personnel; Knowledge; HIV

Correspondence

M. Pereira
Instituto de Saúde Coletiva, Universidade Federal da Bahia.
Rua Basilio da Gama s/n, Salvador, BA 40110-040, Brasil.
pereira.santosm@yahoo.com

- ¹ Programa de Mestrado Profissional em Saúde Coletiva, Universidade do Estado da Bahia, Salvador, Brasil.
² Instituto de Saúde Coletiva, Universidade Federal da Bahia, Salvador, Brasil.
³ Departamento de Ciências da Vida, Universidade do Estado da Bahia, Salvador, Brasil.
⁴ Instituto Multidisciplinar em Saúde, Universidade Federal da Bahia, Vitória da Conquista, Brasil.
⁵ Escola Nacional de Saúde Pública Sergio Arouca, Fundação Oswaldo Cruz, Rio de Janeiro, Brasil.



Introduction

Pre-exposure prophylaxis (PrEP) for HIV is an effective biomedical prevention strategy to address the HIV epidemic worldwide ¹. However, expanding its offer in low- and middle-income countries is necessary ^{2,3}. There are still challenges in the organization of services and PrEP prescription by health care providers ^{4,5}. The low PrEP coverage can diminish the impact this prevention strategy has on the HIV epidemic. Additionally, certain fragilities in the services have been observed, such as low availability of counselors, low familiarity of teams with HIV preventive strategies, and barriers in the access of laboratory tests to monitor the safety of PrEP use ^{6,7}.

Barriers to the prescription of PrEP by health care professionals have been reported worldwide ⁸. Among the main barriers are logistical concerns with clinical and laboratory monitoring, high cost of the drug, challenges in finding people who could benefit from PrEP, concerns about viral resistance and drug toxicity, and the belief that its use would increase the risk behavior of some individuals ^{1,8,9}.

Structural barriers, such as stigmatizing and discriminatory care for young women and adolescents at increased risk of HIV infection, remain in the practices of health care professionals, which results from an existing and entrenched prejudice ¹⁰. Additionally, a high proportion of health care professionals have never heard of PrEP and lack adequate knowledge to prescribe it ¹¹.

Studies conducted in different countries indicate variation in the proportion of knowledge about PrEP according to the professional category ^{12,13,14}. A study conducted in Florida (United States, 2014) most pharmacists reported insufficient knowledge to prescribe PrEP for patients ¹². Another study with physicians and nurses from the Democratic Republic of Congo showed that among the 85 respondents, less than a quarter knew about PrEP, and only half were willing to prescribe it in 2017 ¹³. In another study ¹⁴ conducted with health care professionals from different specialties in hospitals in Missouri (United States, 2019), 37% reported that oral PrEP is taken once a day and only 19% knew it consists of the combination of two antiretrovirals. Thus, studies on barriers and facilitators for prescribing PrEP should be investigated.

Furthermore, few studies investigate the health care professionals' knowledge about PrEP and the factors associated with the unwillingness to prescribe it in Latin America ^{15,16}. Most studies have been conducted in North America ⁴ and Europe ⁸. Therefore, this study aimed to analyze the factors associated with the unwillingness to prescribe PrEP by health care professionals in HIV/AIDS-specialized care services (SCSs).

Materials and methods

Study design and study location

This is a cross-sectional study that integrates the research protocol *Implementation of the National Comprehensive Health Policy for Lesbians, Gays, Bisexuals, Travestis and Transsexuals (PNSI-LGBT) in the State of Bahia*. This protocol aimed to understand the historical conditions for the emergence of the National Policy for Comprehensive LGBT Health (PNSI-LGBT) in the state of Bahia, Northeastern Brazil ¹⁷. One of the secondary objectives was to evaluate the quality of SCSs in the care of HIV/AIDS and other sexually transmitted infections (STIs) for the LGBT population in Bahia ¹⁷.

The study was conducted in 25 SCSs out of a total of 47 SCSs from 21 municipalities in the state of Bahia: Alagoinhas, Barreiras, Bom Jesus da Lapa, Camaçari, Eunápolis, Feira de Santana, Guanambi, Ilhéus, Irecê, Itabuna, Itamaraju, Jequié, Juazeiro, Lauro de Freitas, Paulo Afonso, Porto Seguro, the state capital Salvador (with five SCSs), Senhor do Bonfim, Simões Filho, Teixeira de Freitas, and Vitória da Conquista.

Eligibility criteria

A single-stage cluster sampling selected the municipalities. The selection criteria for the cities considered the highest level of SCSs coverage, different economic and sociopolitical situations, and whether the municipalities offer health services of different technological levels to their populations.

The population corresponded to 252 health care professionals who make up the multidisciplinary team of the SCSs and who worked for at least six months in SCSs and agreed to participate in the study. All professionals available at the services during the period of data collection were invited to participate in the study.

Data collection

Data collection occurred from October 2019 to March 2020 and was conducted by researchers in the selected municipalities after obtaining the consent of the Bahia State Health Department. Following the schedule and planning of the study, the researchers visited the services to get to know the space, meet the team, and apply the questionnaire to the health professionals.

The questionnaire was digitally applied by trained interviewers using tablet computers in a private space within the health service. The questions regarded sociodemographic characteristics, professional identification, prevention methods, and willingness to prescribe PrEP.

Study variables

The unwillingness to prescribe PrEP (yes; no) by health care professionals was considered the outcome variable.

- **Sociodemographic and professional characteristics**

Data were collected on gender (female; male), age (≤ 35 ; $\geq 36 \leq 50$; > 50 years), educational level (high school; higher education; graduate studies), academic training (nurse; physician; others), HIV/AIDS specialty (yes; no), years of training (up to 10; ≥ 10), the period spent working in SCS (< 14 ; ≥ 14 years), type of employment (temporary; tenure), and location of the SCS in the capital (yes; no).

- **General perceptions and knowledge of combined prevention**

The following variables related to PrEP had closed-ended responses (i.e., yes, no): knowledge of the PNSI-LGBT; previous knowledge of PrEP; PrEP offer; knowledge about combined prevention; perception of whether public network professionals are trained; provision for prescription of self-testing for the key population of gay/man who have sex with man (MSM); and post-exposure prophylaxis (PEP) for HIV prevention. They were also asked where they heard about PrEP (i.e., in training actions in the facility, in the media (TV, radio, etc.), internet/social networks, through coworkers and others), and what could be done for permanent education of professionals working in the management of PrEP, with questions about professionals' permanent education, training with more experienced professionals, and courses.

Data analysis

Descriptive analyses were performed with absolute and relative frequency estimation and a 95% confidence interval (95%CI) for categorical variables. The estimation of factors associated with unwillingness to prescribe PrEP was evaluated based on bivariate and multivariate analyses, using odds ratio (OR) and its respective 95%CI. Multivariate analysis was conducted in two steps. Initially, a bivariate analysis model was created for the identification of crude associations between exposure and unwillingness to prescribe PrEP. In the multivariate model, logistic regression was used, including all variables, which presented a p-value < 0.20 in both crude and stratified analyses. For the final model, only variables with p < 0.05 remained using the backward approach¹⁸. The theoretical relevance of including variables in the final model was considered. The analyses were performed using the Stata software, version 17 (<https://www.stata.com>).

Ethical aspects

The research was approved by the Research Ethics Committee of the Multidisciplinary Health Institute of the Federal University of Bahia (IMS/UFBA) on August 21, 2019 (process n. 3,082,370). Written informed consent was obtained from all participants. All steps included in this study were conducted in accordance with the ethical and legal issues defined in *Resolution n. 466/2012* of the Brazilian National Health Council, which regulates research involving human beings in Brazil.

Results

Characteristics of participants and service

From 490 health care professionals registered in the Brazilian National Register of Health Establishments in March 2020, 252 health professionals from the SCSs were interviewed and included in this study, representing 51.4% of the total population.

Most participants were aged from 36 to 50 years (54.4%), from SCS in the state capital (65.9%), and women (78.2%). Half participants (51%) reported having a specialization course degree, and 53.1% knew about the PNSI-LGBT.

Regarding PrEP prescribers, nurses corresponded to 25.7% and physicians to 11.9%, while 62.4% were other health care professionals with technical and higher education qualifications, such as nursing technicians, psychologists, pharmacists, occupational therapists, physical therapists, social workers, and dentists.

Most participants (73.4%) reported having worked in the SCSs for at least 14 years. Tenure via open selection was the most common mode of employment mentioned by professionals (66.3%), and 23.4% reported having a specialization course degree in the area of HIV/AIDS. More than half (74.2%) reported having more than ten years of education (Table 1).

Table 1 shows that 15.2% (95%CI: 10.8-19.6) of the health care professionals reported unwillingness to prescribe PrEP, even though previous knowledge of it was relatively high (96%). When stratifying the results according to nursing, physicians, and other professionals, no difference regarding knowledge of PrEP and unwillingness to prescribe PrEP was observed (Figure 1). More than half participants (63.7%) indicated knowing PrEP via permanent education programs and training performed in the service, followed by information from coworkers (15.8%), other sources of information (11.5%), media (TV, radio, etc.) (5.1%) and internet or social networks (3.9%). Only 32.9% reported that their services provide PrEP.

The results of bivariate logistic regression analyses showed an increased chance of unwillingness to prescribe PrEP by health care professionals who reported non-prescription of HIV self-testing for key populations nor PEP for the general population (Table 2). Moreover, professionals with graduate degrees had lower chances of not prescribing PrEP, and professionals who reported not prescribing HIV self-testing for key populations and indicate PEP for HIV prevention had a higher chance of unwillingness to prescribe PrEP.

In the multivariate analysis (Table 3), a higher chance of unwillingness to prescribe PrEP was observed among professionals who reported not prescribing HIV self-testing for key populations ($_{\text{adjusted}}\text{OR} = 5.4$; 95%CI: 1.3-22.4) nor PEP ($_{\text{adjusted}}\text{OR} = 2.00$; 95%CI: 1.3-3.1), professionals working in services in the state capital ($_{\text{adjusted}}\text{OR} = 3.9$; 95%CI: 1.4-10.2), and when PrEP was not available in the service ($_{\text{adjusted}}\text{OR} = 1.7$; 95%CI: 1.1-2.8).

Health care professionals who reported no need to attend to training and courses ($_{\text{adjusted}}\text{OR} = 1.3$; 95%CI: 1.1-1.8), or the need to promote activity with more experienced professionals to work in PrEP management ($_{\text{adjusted}}\text{OR} = 1.8$; 95%CI: 1.1-3.8) presented a statistically significant association with the unwillingness to prescribe PrEP. Graduate degrees ($_{\text{adjusted}}\text{OR} = 0.3$; 95%CI: 0.1-0.8) remained associated with a lower proportion of unwillingness to prescribe PrEP (Table 3).

Table 1

Characteristics of health care professionals working in specialized care services (SCSs) for HIV/AIDS and other sexually transmitted infections (STIs). State of Bahia, Brazil, 2019-2020.

Characteristics	n	%	95%CI
Sociodemographic			
Gender			
Male	55	21.8	17.1-27.3
Female	197	78.2	72.6-82.0
Age (years)			
≤ 35	46	18.2	13.9-23.5
≥ 36 ≤ 50	137	54.4	48.1-60.4
> 50	69	27.4	22.2-33.2
Educational level *			
High school	39	15.5	11.5-20.5
Higher education	50	19.9	15.4-25.6
Graduate studies	162	64.6	58.1-69.9
Training and work			
Professional category			
Nurse	65	25.7	20.7-31.5
Physician	30	11.9	8.4-16.5
Other professionals	157	62.4	56.1-68.0
HIV/AIDS specialty			
Yes	59	23.4	18.5- 29.0
No	193	76.6	70.9-81.4
Years of training			
< 10	65	25.8	20.7-31.5
≥ 10	187	74.2	68.4-79.2
Period spent working in SCS (years)			
< 14	185	73.4	67.5-78.5
≥ 14	67	26.6	21.4-32.4
Type of employment			
Temporary	85	33.7	28.1-39.8
Tenure	167	66.3	60.1-71.8
Previous knowledge regarding PrEP			
Yes	242	96.0	92.7-97.8
No	10	4.0	2.1-7.2
Unwillingness to prescribe PrEP			
Yes	215	84.8	80.3-89.1
No	37	15.2	10.8-19.6
How did you come to know about PrEP **			
Permanent education/Training actions	149	63.7	57.2-69.6
Via media (TV, radio, etc.)	12	5.1	2.9-8.8
Internet or social networks	9	3.9	2.0- 7.2
Through coworkers	37	15.8	11.6-21.0
Other	27	11.5	8.0-16.3
Location of the SCS in the state capital			
Yes	166	65.9	59.7-71.4
No	86	34.1	28.5-40.0
Service offers PrEP			
Yes	84	32.9	27.3-39.0
No	168	67.1	60.9-72.6

(continues)

Table 1 (continued)

Characteristics	n	%	95%CI
Knowledge of PNSI-LGBT			
No	118	46.9	40.7-53.0
Yes	134	53.1	46.9-59.2
Indicate HIV self-test for the key gay/MSM population ***			
Yes	53	21.7	16.9-27.3
No	191	78.3	72.6-83.0
Indicate PEP for HIV prevention			
Yes	154	61.1	54.9-66.9
No	98	38.9	33.0-45.0
Continuing education regarding PrEP			
Public network professionals are trained #			
Yes	66	26.4	21.2-32.2
No	184	73.6	67.7-78.7
Promote experience with more experienced professionals			
Yes	88	34.9	29.2-41.0
No	164	65.1	58.9-70.7
Promote training and courses			
Yes	168	66.7	60.5-72.2
No	84	33.3	27.7-39.4

95%CI: 95% confidence interval; MSM: men who have sex with men; PEP: post-exposure prophylaxis;

PNSI-LGBT: National Policy for Comprehensive LGBT Health; PrEP: pre-exposure prophylaxis.

* n = 251;

** n = 234;

*** n = 244;

n = 250.

Discussion

This is one of the first studies on the unwillingness to prescribe PrEP by professionals working in the SCSs in Brazil. This study demonstrated that health professionals willing to prescribe PrEP also recognize the need to prescribe other combined HIV prevention measures such as HIV self-testing for populations at increased risk of HIV infection and the use of PEP when the person had been exposed to HIV.

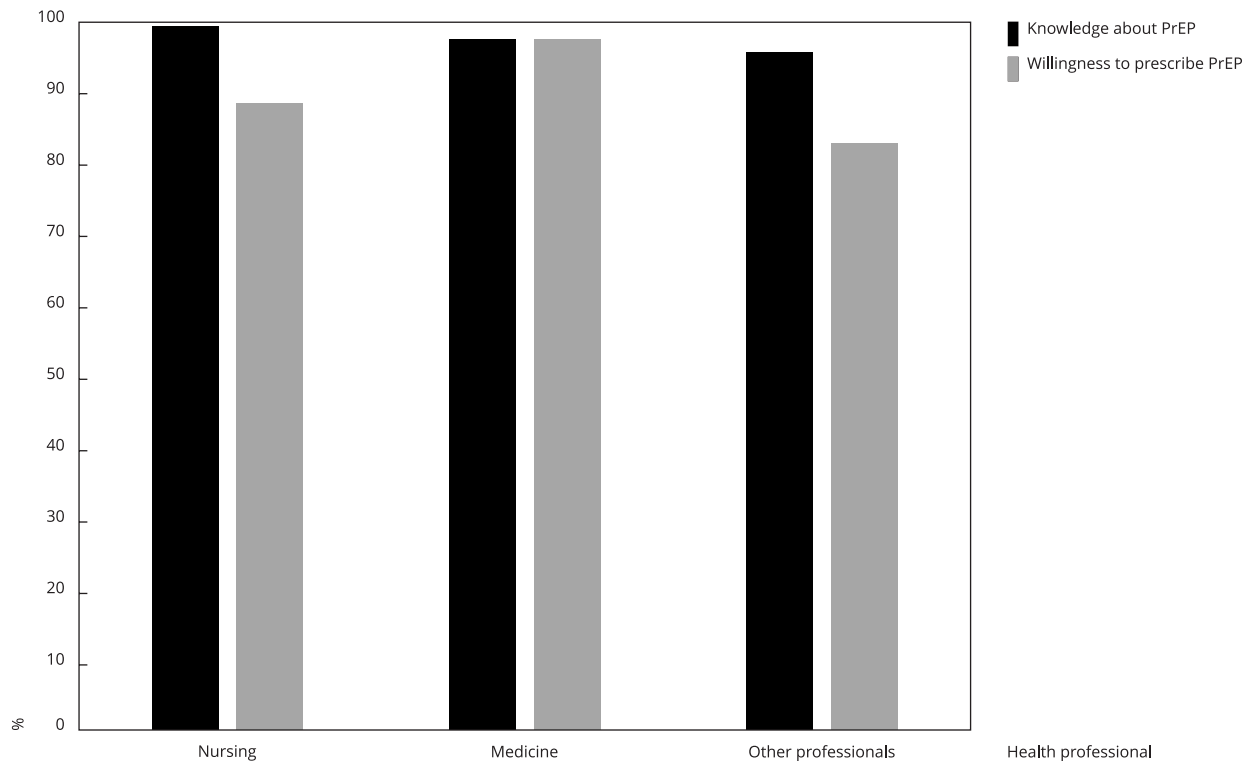
Within this context, our study identified that more than half of the professionals had PrEP knowledge, and the likelihood of unwillingness to prescribe PrEP decreases when they are associated with the willingness to prescribe HIV self-tests for key populations. This can be interpreted as a positive factor for HIV prevention ¹⁹.

Studies highlight the need to decentralize PrEP to primary health care. An intervention study ²⁰ with targeted clinical education, combined with electronic health record templates, was associated with a significant increase in PrEP prescriptions in the United States. Another study ²¹ with primary care physicians and nurses of a sexual health clinic in Canada found that a nurse-led PrEP and patient-initiated continuing medical education are feasible strategies for increasing PrEP uptake and that most patients preferred the nurse-led PrEP delivery. Therefore, expanding strategies to disseminate the use of PrEP among professionals and users is valid, considering that professionals who reported no need to attend training and courses or training with more experienced professionals were unwilling to prescribe PrEP ²¹.

We also noticed that non-prescription of PEP contributed to the unwillingness to prescribe PrEP, which highlights the importance of training in combination HIV prevention, considering that these strategies components must be jointly prescribes in order to reduce new HIV infections ²².

Figure 1

Pre-exposure prophylaxis (PrEP) knowledge and willingness of health care professionals to offer PrEP in specialized care services (SCSs) for HIV/AIDS and other sexually transmitted infections (STIs). State of Bahia, Brazil, 2019-2020.



There are challenges to the provision of combination-prevention technologies in Brazil. A study on HIV prevention in the municipalities of Baixada Fluminense area, state of Rio de Janeiro, highlighted the absence of local prevention planning and testing actions for the key population of these municipalities, as well as a lack of information on PrEP and PEP use²³. Managers justified this gap as being due to the difficulty in identifying and approaching this population and the lack of training of health professionals to address sexuality-related issues.

Regarding the knowledge of health workers about PrEP, a high percentage (96%) was found, which is similar to that identified in 2013 a study in the United Kingdom, with 212 professionals, in which 80% of the health care professionals reported a high or medium level of knowledge²⁴. On the other hand in a study conducted in Paraíba (Brazil)²⁵, in 2017, 29% of health care professionals who also worked in SCSs, testing services, and management of HIV services, reported not knowing about PrEP. This might have occurred because the study was conducted in the year PrEP was implemented in Brazil. A study¹⁵ conducted in Brazil from 2016 to 2017 reported that 75% of infectious disease physicians knew about PrEP, and 63% to 69% reported willingness to prescribe PrEP for MSM or sex workers with inconsistent condom use. The ImPrEP study¹⁶, conducted from January to October 2020, evaluated behaviors related to PrEP and other HIV prevention strategies among Brazilian and Mexican infectious disease physicians with high knowledge about PrEP (84.6%) and reported that 78% were willing to prescribe PrEP. The most frequent barriers regarded assumptions that users could have low knowledge and limited capacity to adhere to PrEP, and a lack of professionals to prescribe PrEP¹⁶. A review of 36 studies on the implementation of PrEP care among health care professionals in the United States²⁶ showed the following barriers at various levels – drug level: provider’s concerns

Table 2

Bivariate analysis of factors associated with unwillingness to prescribe pre-exposure prophylaxis (PrEP) among professionals from specialized care services (SCSs) for HIV/AIDS and other sexually transmitted infections (STIs). State of Bahia, Brazil, 2019-2020.

Characteristics	Unwillingness to indicate PrEP (%)		Bivariate analysis		
	No (n = 37)	Yes (n = 215)	crudeOR	95%CI	p-value
Sociodemographic					
Gender					
Male	7.3	92.7	1.0		
Female	16.8	83.2	2.6	0.9-7.5	0.089
Age (years)					
≤ 35	17.4	82.6	1.0		
≥ 36 ≤ 50	15.3	84.7	0.7	0.2-1.5	0.194
> 50	11.6	88.41	0.3	0.2-1.8	0.382
Educational level					
High school	30.8	69.2	1.0		
Higher education	16.0	84.0	0.4	0.1-1.1	0.194
Graduate studies	10.5	89.5	0.3	0.1-0.8	0.018
Training and work					
Prescriber					
Other	9.5	90.5	1.0		
Nurses and physicians	17.8	82.2	0.4	0.2-1.0	0.074
HIV/AIDS specialty					
Yes	8.5	91.5	1.0		
No	16.6	83.4	2.1	0.8-5.8	0.131
Years of training					
< 10	13.9	86.1	1.0		
≥ 10	16.9	83.1	1.1	0.8-1.7	0.554
Period spent working in SCS (years)					
< 14	10.5	89.5	1.0		
≥ 14	16.2	83.8	1.7	0.7-4.0	0.257
Type of employment					
Temporary	14.4	85.6	1.0		
Tenure	15.3	84.7	1.1	0.5-2.2	0.845
Location of the SCS in the state capital					
No	13.2	86.8	1.0		
Yes	17.4	82.6	1.4	0.7-2.8	0.374
Service offers PrEP					
Yes	9.6	90.4	1.0		
No	17.2	82.8	1.4	0.9-2.1	0.118
Knowledge of PNSI-LGBT					
No	12.7	87.3	1.0		
Yes	16.9	83.1	1.2	0.8-1.7	0.342
Indicate HIV self-test for the key gay/MSM population					
Yes	5.7	94.3	1.0		
No	17.1	82.9	5.7	2.2-14.3	0.000
Indicate PEP for HIV prevention					
Yes	11.7	88.3	1.0		
No	25.5	74.5	1.6	1.1-2.3	0.013

(continues)

Table 2 (continued)

Characteristics	Unwillingness to indicate PrEP (%)		Bivariate analysis		
	No (n = 37)	Yes (n = 215)	crudeOR	95%CI	p-value
Continuing education regarding PrEP					
Public network professionals are trained					
Yes	13.6	86.4	1.0		
No	15.2	84.8	1.06	0.7-1.6	0.756
Promote experience with more experienced professionals					
Yes	9.1	90.9	1.0		
No	17.7	82.3	1.5	1.0-2.2	0.071
Promote training and courses					
Yes	11.9	78.1	1.0		
No	16.1	83.9	1.1	0.9-1.3	0.380

95%CI: 95% confidence interval; MSM: men who have sex with men; OR: odds ratio; PrEP: post-exposure prophylaxis; PNSI-LGBT: National Policy for Comprehensive LGBT Health.

about efficacy, safety, side effects, and drug resistance; patient level: lack of PrEP requests and low support; provider level: lack of awareness/knowledge/skills, lack of training, workload management, and concerns about potential risk compensation (e.g., reduced condom use after PrEP prescription); and structural level: cost/insurance coverage, lack of PrEP-oriented care models, lack of guidance for specific groups, including adolescents, intravenous drug users, and HIV-serodiscordant couples ²⁶.

In turn, in a cross-sectional online survey conducted with Chinese physicians in 12 provinces of China ²⁷, due to the absence of guidelines on PrEP, less than half of professionals (47.2%) were willing to provide PrEP for the population at high risk for HIV, which indicates a low awareness of professionals about this prevention strategy. It is noteworthy that health care professionals should act not only based on their knowledge and disposition of prescription but also to break barriers, i.e., prejudices and stigmas related to the population at increased risk of HIV infection.

Additionally, this study indicated that professionals working in the inland municipalities of Bahia are more willing to prescribe PrEP compared to professionals in the capital. This leads us to understand the need to expand PrEP services in the inland municipalities, with consequent expansion of PrEP offer, as well as the training of these professionals for the existing combination-prevention strategies. On the other hand, conducting awareness-raising actions on PrEP aimed at the professionals who make up the capital's health services is also needed.

The main limitation of our study is its small sample size, which may have hampered the identification of other factors associated with the non-prescription of PrEP. Furthermore, the cross-sectional design makes hinders the evaluation of possible causality relationships. However, our study was carefully planned and involved researchers' training to reduce the possibility of bias during data collection. We recommend developing further studies with an interdisciplinary approach to a better understanding of different elements that may also explain the non-prescription of PrEP in specialized services.

This study identified a high level of knowledge of PrEP, but still a proportion of health care professionals who are unwilling to prescribe PrEP. Although PrEP is a biomedical strategy, its implementation, acceptance, and adherence occur in the experience of social life, in synergy with a set of elements that involve knowledge, attitudes, values, and power relations that generate tensions and obstacles related to HIV, which persists in being socially seen in its stigmatizing condition. Accordingly, we suggest the expansion of permanent education in combin with HIV prevention among health care professionals, especially for physicians and nurses, as well as the need to expand the offer of PrEP in health services for people at increased risk of HIV infection. Education programs should strengthen knowledge regarding PrEP and address concerns that lead to reluctance to prescribe it.

Table 3

Adjusted odds ratios (OR) for factors associated with unwillingness to prescribe pre-exposure prophylaxis (PrEP) among professionals of specialized care services (SCSs) for HIV/AIDS and other sexually transmitted infections (STIs). State of Bahia, Brazil, 2019-2020.

Characteristics	adjusted OR	95%CI	p-value
Sociodemographic			
Gender			
Male	1.0		
Female	2.5	0.7-8.8	0.158
Age (years)			
≤ 35	1.0		
≥ 36 ≤ 50	0.8	0.3-2.3	0.675
> 50	0.6	0.1-1.6	0.210
Educational level			
High school	1.0		
Higher education	0.5	0.1-1.4	0.183
Graduate studies	0.3	0.1-0.8	0.017
Training and work			
Prescriber			
Other	1.0		
Nurses and physicians	0.8	0.3-1.9	0.558
HIV/AIDS specialty			
Yes	1.0		
No	1.4	0.5-4.4	0.521
Location of the SCS in the state capital			
No	1.0		
Yes	3.9	1.4-10.2	0.007
Service offers PrEP			
Yes	1.0		
No	1.7	1.1-2.8	0.035
Indicate HIV self-test for the key gay/MSM population			
Yes	1.0		
No	5.4	1.3-22.4	0.020
Indicate PEP for HIV prevention			
Yes	1.0		
No	2.0	1.3-3.1	0.002
Continuing education regarding PrEP			
Promote experience with more experienced professionals			
Yes	1.0		
No	1.8	1.1-3.8	0.014
Promote training and courses			
Yes	1.0		
No	1.3	1.1-1.8	0.031

95%CI: 95% confidence interval; MSM: men who have sex with men; PEP: post-exposure prophylaxis.

Contributors

J. S. Lamônica contributed in the data analysis and interpretation and writing, and approved the final version. L. Magno contributed in the study conception and planning, data analysis and review, and approved the final version. J. E. J. S. Santos contributed in the data collection and review, and approved the final version. I. Dourado contributed in the data discussion and review, and approved the final version. A. M. Santos contributed the study design, data discussion and review, and approved the final version. M. Pereira contributed to the study design, data collection, analysis, and interpretation, and review, and approved the final version.

Additional information

ORCID: Juliana de Souza Lamônica (0000-0002-6785-4516); Laio Magno (0000-0003-3752-0782); Julia Elen Jesus da Silva Santos (0000-0002-4579-3257); Ines Dourado (0000-0003-1675-2146); Adriano Maia dos Santos (0000-0001-9718-1562); Marcos Pereira (0000-0003-3766-2502).

Acknowledgments

The project was selected and funded by the Brazilian National Research Council – CNPq (Edital CNPq/MS-DIAHV n. 11/2018 – Axis 3 – CNPq Universal Service Management Analysis – 14/2011 – process: 404011/2018-7). Funding: Brazilian Ministry of Health, through the CNPq.

References

1. Krakower D, Ware N, Mitty JA, Maloney K, Mayer KH. HIV providers' perceived barriers and facilitators to implementing pre-exposure prophylaxis in care settings: a qualitative study. *AIDS Behav* 2014; 18:1712-21.
2. Schmidt H-MA, Schaefer R, Nguyen VTT, Radebe M, Sued O, Rodolph M, et al. Scaling up access to HIV pre-exposure prophylaxis (PrEP): should nurses do the job? *Lancet HIV* 2022; 9:e363-6.
3. Rebe K, Hoosen N, McIntyre JA. Strategies to improve access for MSM in low-income and middle-income countries. *Curr Opin HIV AIDS* 2019; 14:387-92.
4. Pleuhs B, Quinn KG, Walsh JL, Petroll AE, John SA. Health care provider barriers to HIV pre-exposure prophylaxis in the United States: a systematic review. *AIDS Patient Care STDS* 2020; 34:111-23.
5. Pimenta MC, Bermúdez XP, Godoi AMM, Maksud I, Benedetti M, Kauss B, et al. Barreiras e facilitadores do acesso de populações vulneráveis à PrEP no Brasil: Estudo Im-PrEP Stakeholders. *Cad Saúde Pública* 2022; 38:e00290620.
6. Zucchi EM, Grangeiro A, Ferraz D, Pinheiro TF, Alencar T, Ferguson L, et al. Da evidência à ação: desafios do Sistema Único de Saúde para ofertar a profilaxia pré-exposição sexual (PrEP) ao HIV às pessoas em maior vulnerabilidade. *Cad Saúde Pública* 2018; 34:e00206617.
7. Krakower DS, Oldenburg CE, Mitty JA, Wilson IB, Kurth AE, Maloney KM, et al. Knowledge, beliefs and practices regarding antiretroviral medications for HIV prevention: results from a survey of healthcare providers in New England. *PLoS One* 2015; 10:e0132398.
8. Koechlin FM, Fonner VA, Dalglish SL, O'Reilly KR, Baggaley R, Grant RM, et al. Values and preferences on the use of oral pre-exposure prophylaxis (PrEP) for HIV prevention among multiple populations: a systematic review of the literature. *AIDS Behav* 2017; 21:1325-35.
9. Bil JP, Hoornenborg E, Prins M, Hogewoning A, Lima FDG, de Vries HJC, et al. The acceptability of pre-exposure prophylaxis: beliefs of health-care professionals working in sexually transmitted infections clinics and hiv treatment centers. *Front Public Health* 2018; 6:5.
10. Pilgrim N, Jani N, Mathur S, Kahabuka C, Sarria V, Makyao N, et al. Provider perspectives on PrEP for adolescent girls and young women in Tanzania: the role of provider biases and quality of care. *PLoS One* 2018; 13:e0196280.
11. Senn H, Wilton J, Sharma M, Fowler S, Tan DHS. Knowledge of and opinions on HIV pre-exposure prophylaxis among front-line service providers at Canadian AIDS service organizations. *AIDS Res Hum Retroviruses* 2013; 29:1183-9.

12. Shaeer KM, Sherman EM, Shafiq S, Hardigan P. Exploratory survey of Florida pharmacists' experience, knowledge, and perception of HIV pre-exposure prophylaxis. *J Am Pharm Assoc* (2003) 2014; 54:610-7.
13. Bepouka BI, Situakibanza H, Kokusa Y, Nkondila A, Kizunga F, Kiazayawoko F. Care providers' knowledge and willingness to prescribe pre-exposure prophylaxis (PrEP) in Kinshasa, Democratic Republic of Congo (DRC). *Pan Afr Med J* 2019; 34:166.
14. Abu-Khalaf S, Dent J, Teti M, Dandachi D. Are we prescribing enough HIV pre-exposure prophylaxis in Missouri? A cross-sectional study at University of Missouri health care. *Mo Med* 2020; 117:563-8.
15. Cerqueira N, Vasconcelos R, Hojilla C, Kallas E, Avelino-Silva V. Attitudes and knowledge about HIV PrEP among infectious diseases physicians in Brazil. *AIDS Res Hum Retroviruses* 2018; 34:275.
16. Vega-Ramirez H, Torres TS, Guillen-Diaz C, Pimenta C, Diaz-Sosa D, Konda KA, et al. Awareness, knowledge, and attitudes related to HIV pre-exposure prophylaxis and other prevention strategies among physicians from Brazil and Mexico: cross-sectional web-based survey. *BMC Health Serv Res* 2022; 22:532.
17. Bezerra MVR, Magno L, Prado NMBL, Santos AM. Condições históricas para a emergência da Política Nacional de Saúde Integral LGBT no espaço social da saúde no Estado da Bahia, Brasil. *Cad Saúde Pública* 2021; 37:e00221420.
18. Hosmer Jr. DW, Lemeshow S, Sturdivant RX. *Applied logistic regression*. Hoboken: John Wiley & Sons; 2013.
19. Figueroa C, Johnson C, Verster A, Baggaley R. Attitudes and acceptability on HIV self-testing among key populations: a literature review. *AIDS Behav* 2015; 19:1949-65.
20. Lumsden J, Dave AJ, Johnson C, Blackmore C. Improving access to pre-exposure prophylaxis for HIV prescribing in a primary care setting. *BMJ Open Qual* 2022; 11:e001749.
21. Charest M, Sharma M, Chris A, Schnubb A, Knox DC, Wilton J, et al. Decentralizing PrEP delivery: implementation and dissemination strategies to increase PrEP uptake among MSM in Toronto, Canada. *PLoS One* 2021; 16:e0248626.
22. DeHaan E, McGowan JP, Fine SM, Vall R, Merrick ST, Radix A, et al. *PEP to prevent HIV infection*. Baltimore: Johns Hopkins University; 2021.
23. Monteiro S, Brigeiro M. *Prevenção do HIV/ Aids em municípios da Baixada Fluminense, Rio de Janeiro, Brasil: hiatos entre a política global atual e as respostas locais*. Interface (Botucatu) 2019; 23:e180410.
24. Desai M, Gafos M, Dolling D, McCormack S, Nardone A. Healthcare providers' knowledge of, attitudes to and practice of pre-exposure prophylaxis for HIV infection. *HIV Med* 2016; 17:133-42.
25. Batista AT. *Prevenir ou remediar? Atitudes dos profissionais de saúde frente a profilaxia pré-exposição ao HIV/AIDS* [Master's Thesis]. João Pessoa: Programa de Pós-graduação em Psicologia Social, Universidade Federal da Paraíba; 2017.
26. Zhang C, McMahon J, Fiscella K, Przybyla S, Braksmajer A, LeBlanc N, et al. HIV pre-exposure prophylaxis implementation cascade among health care professionals in the United States: implications from a systematic review and meta-analysis. *AIDS Patient Care STDS* 2019; 33:507-27.
27. Cui S, Ding H, Huang X, Wang H, Tang W, Leuba SI, et al. Factors influencing clinicians' willingness to prescribe pre-exposure prophylaxis for persons at high risk of HIV in China: cross-sectional online survey study. *JMIR Public Health Surveill* 2021; 7:e24235.

Resumo

O objetivo deste estudo foi analisar fatores associados a não disposição para oferta de profilaxia pré-exposição (PrEP) por profissionais de saúde de serviços especializados em HIV/aids. Este é um estudo transversal, realizado com 252 profissionais de saúde de 29 serviços de atenção especializada (SAEs) em HIV/aids em 21 municípios do Estado da Bahia, Brasil. Para ser incluído no estudo, o profissional precisava estar trabalhando há pelo menos seis meses no serviço. Dados sociodemográficos, ocupacionais e comportamentais foram coletados por meio de questionário. Foi realizada regressão logística, com estimativa de razão de chances (OR) bruta e ajustada, com os respectivos intervalos de 95% de confiança (IC95%). A relutância em prescrever PrEP foi de 15,2% (IC95%: 10,8-19,6). Os fatores associados à relutância em prescrever PrEP foram a não prescrição de auto-testes de HIV para populações-chave ($OR_{ajustada} = 5,4$; IC95%: 1,3-22,4) nem profilaxia pós-exposição ($OR_{ajustada} = 2,00$; IC95%: 1,3-3,1), localização do SAE na capital do estado ($OR_{ajustada} = 3,9$; IC95%: 1,4-10,2) e SAE sem oferta de PrEP ($OR_{ajustada} = 1,7$; IC95%: 1,1-2,8); profissionais que não relataram a necessidade de realizar treinamentos e cursos ($OR_{ajustada} = 1,3$; IC95%: 1,1-1,8) ou treinamento com profissionais mais experientes ($OR_{ajustada} = 1,8$; IC95%: 1,1-3,8) foram associados a uma menor proporção de relutância em prescrever PrEP. Nossos resultados indicam que os fatores contextuais, organizacionais e de treinamento dos profissionais de saúde podem contribuir para a indicação da PrEP. Sugerimos expandir o treinamento existente em prevenção combinada ao HIV entre os profissionais de saúde e aumentar a disponibilidade de PrEP nos serviços de saúde.

Profilaxia Pré-Exposição; Atitude do Pessoal de Saúde; Conhecimento; HIV

Resumen

El objetivo de este estudio fue analizar los factores asociados con la resistencia de los profesionales de la salud de los servicios especializados en VIH/SIDA a prescribir la profilaxis preexposición (PrEP). Se trata de un estudio transversal, realizado con 252 profesionales de la salud de 29 servicios de atención especializada (SAE) en VIH/SIDA en 21 municipios del estado de Bahía, Brasil. Los criterios de inclusión en el estudio fueron tener experiencia laboral de al menos seis meses en el servicio. Los datos sociodemográficos, ocupacionales y conductuales se recogieron mediante cuestionario. Se realizó regresión logística, con estimaciones de odds ratios (OR) cruda y ajustada, con los respectivos intervalos de 95% de confianza (IC95%). La resistencia a prescribir PrEP fue del 15,2% (IC95%: 10,8-19,6). Los factores asociados con la resistencia a prescribir la PrEP fueron no prescribir autopruebas de VIH para poblaciones clave ($OR_{ajustada} = 5,4$; IC95%: 1,3-22,4) ni la profilaxis posexposición ($OR_{ajustada} = 2,00$; IC95%: 1,3-3,1), ubicación del SAE en la capital del estado ($OR_{ajustada} = 3,9$; IC95%: 1,4-10,2) y SAE sin oferta de PrEP ($OR_{ajustada} = 1,7$; IC95%: 1,1-2,8); los profesionales que no reportaron la necesidad de hacer capacitación y cursos ($OR_{ajustada} = 1,3$; IC95%: 1,1-1,8) o capacitación con profesionales con mayor experiencia ($OR_{ajustada} = 1,8$; IC95%: 1,1-3,8) se asociaron con una menor proporción de resistencia a prescribir PrEP. Los resultados indican que los factores contextuales, organizativos y formativos de los profesionales de la salud pueden contribuir a la indicación de la PrEP. Se recomienda que se amplíe la capacitación existente sobre prevención combinada del VIH entre los trabajadores de la salud y aumente la disponibilidad de PrEP en los servicios de salud.

Profilaxis Pre-Exposición; Actitud del Personal de Salud; Conocimiento; VIH

Submitted on 30/Jun/2022

Final version resubmitted on 26/Jan/2023

Approved on 06/Feb/2023