

Original Article

Título: Efeitos da PrEP no uso de preservativos entre homens que fazem sexo com homens

Title: Effect of PrEP on condom use among men who have sex with men

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RESUMO:

INTRODUÇÃO: As infecções sexualmente transmissíveis (ISTs) continuam sendo um problema crítico de saúde pública global. A Profilaxia Pré-Exposição (PrEP), que envolve o uso diário de tenofovir e emtricitabina, provou ser altamente eficaz na prevenção da transmissão do HIV, especialmente entre grupos de alto risco, como homens que fazem sexo com homens (HSH). No entanto, o uso da PrEP pode reduzir involuntariamente o uso do preservativo, aumentando potencialmente o risco de adquirir outras ISTs. Estudos enfatizam a necessidade de programas de conscientização para abordar esses comportamentos não intencionais.

OBJETIVO: Avaliar o impacto da PrEP no uso do preservativo e a incidência de ISTs entre HSH, comparando as taxas de IST entre usuários e não usuários da PrEP.

METODOLOGIA: Um estudo transversal foi conduzido usando questionários sobre comportamento sexual e uso da PrEP entre HSH. A coleta de dados ocorreu via mídia social de outubro de 2021 a maio de 2022, tendo como alvo 154 homens de 18 a 50 anos de Bauru, São Paulo e arredores.

RESULTADOS: Dos 152 participantes, 86,4% conheciam a PrEP, e 17 a usaram. Entre os usuários, 35,3% relataram uso inconsistente ou nenhum uso de preservativo, enquanto as taxas de IST foram de 53% em usuários de PrEP versus 21,9% em não usuários. Aproximadamente 17,5% dos participantes expressaram relutância em usar a PrEP.

CONCLUSÃO: Embora a PrEP seja eficaz na prevenção do HIV, este estudo destaca sua associação com comportamentos sexuais de risco, levando a maiores taxas de IST. A educação abrangente é essencial para mitigar esses riscos.

PALAVRAS-CHAVE: População HSH. Utilização de profilaxia pré-exposição. Prevenção de infecções sexualmente transmissíveis.

ABSTRACT:

INTRODUCTION: Sexually transmitted infections (STIs) remain a critical global public health issue. Pre-Exposure Prophylaxis (PrEP), which involves the daily use of tenofovir and emtricitabine, has proven highly effective in preventing HIV transmission, especially among high-risk groups like men who have sex with men (MSM). However, PrEP usage may unintentionally reduce condom use, potentially increasing the risk of acquiring other STIs. Studies emphasize the need for awareness programs to address these unintended behaviors.

OBJECTIVE: To evaluate the impact of PrEP on condom usage and the incidence of STIs among MSM, comparing STI rates between PrEP users and non-users.

METHODOLOGY: A cross-sectional study was conducted using questionnaires about sexual behavior and PrEP usage among MSM. Data collection occurred via social media from October 2021 to May 2022, targeting 154 men aged 18–50 from Bauru, São Paulo, and its surroundings.

RESULTS: Of the 152 participants, 86.4% were aware of PrEP, and 17 had used it. Among users, 35.3% reported inconsistent or no condom use, while STI rates were 53% in PrEP users versus 21.9% in non-users. Approximately 17.5% of participants expressed unwillingness to use PrEP.

CONCLUSION: Although PrEP is effective in preventing HIV, this study highlights its association with risky sexual behaviors, leading to higher STI rates. Comprehensive education is essential to mitigate these risks.

KEYWORDS: MSM Population. Pre-Exposure-Prophylaxis utilization. Sexually transmitted infections prevention.

INTRODUCTION

Sexually transmitted infections (STIs) are defined as infections caused by bacteria, viruses, and other microorganisms that are transmitted predominantly through sexual contact ¹.

Regardless of the mode of transmission, it is evident that STIs are a significant barrier to global public health, as indicated by the WHO's survey in 2021, which suggests that in the same year, 650,000 people died from HIV-related causes^{2,3}. The Brazilian scenario is by no means free from this public health scourge, presenting an epidemiological profile marked by upward trends in various STIs^{2,3}. For example, according to the Syphilis Epidemiological Bulletin, nearly 153,000 new cases of acquired syphilis were reported in the country in 2019, leading to a detection rate of approximately 72.8 cases per 100,000 Brazilians². From 2007 to 2017, Brazil reported 230,547 cases of HIV infection to the Ministry of Health³. Over the past five years, the country has recorded an average of 40,000 new AIDS cases, with about 67% among men and 33% among women³. It is estimated that approximately 15.6% of those infected do not know their serological status³.

Although HIV treatment is very effective, there is no cure for this condition⁴⁻⁶. Therefore, HIV prevention measures are widely disseminated and encouraged⁴⁻⁶. Between them the Pre-Exposure Prophylaxis (PrEP), stands out⁴⁻⁶. This measure consists in the daily ingestion of two medications, tenofovir and emtricitabine, that significantly reduces the chances of HIV infection, especially among men who have sex with men (MSM), sex workers, among others⁴⁻⁶.

However, although PrEP is a potentially important agent in combating STIs, specifically AIDS, the use of such medication may be associated with some risks⁴⁻⁶. In case, when not associated with adequate awareness about it can lead to a false sense of security among its users, where being protected against AIDS leads to a reduction in condom use⁴⁻⁶. Users' perception of reduced HIV acquisition risk due to PrEP may lead them to engage in more high-risk sexual practices, thereby increasing their chances of acquiring other STIs⁴⁻⁶. Some studies point to this reduction in condom use associated with PrEP use, reinforcing this theory⁵⁻¹¹.

OBJECTIVE:

Therefore, this study was created with the aim to assess the influence of PrEP usage on the non-utilization of barrier methods during sexual intercourse among men who have sex with men and to compare the incidence of STIs within this group.

METHODS:

STUDY CHARACTERIZATION:

This is a cross-sectional study that evaluated the sexual health profiles of MSM through questionnaires sent via dating apps, Tinder ®, Grindr ®, and UMatch ®, between September 15, 2021, to March 15, 2022.

DATA COLLECTION:

Data were collected by contacting and administering questionnaires to consenting volunteers through dating apps.

In this sense, a profile named was “Men's health research” created in each one of the previously cited dating apps. In the profile information was described that "Would you be interested in participating in a project that promotes men's health?" - figure 1. The profile interests were directed to men with interest in men. The profile presents clear information, citing the research is about the use of PrEP and the sexual health of MSM and inviting individuals to participate in the research. If a user on these apps expressed interest in the study, they react to the research profile by giving it a "like", which lead to a “match”. So, a chat between the research profile and the potential participant was initiated. Researchers would send the links for the informed consent form and the questionnaire, both presented digitally through Google Forms ®.

It is important to note that for a match to be made, both the candidate and the research profile must reciprocate with a "like". Researchers reacted with "likes" to all profiles that fit the target audience - MSM residents of Bauru or the surrounding region aged between 18 and 50 years old.



Figure 1 - profile photo from the of the accounts through which individuals were invited to participate in the research. Written in Portuguese, its translation means: would you like to participate in a project that seeks to promote men's health?

EXCLUSION AND INCLUSION CRITERIA

Were excluded all participants that did not complete the questionnaire; did not agree to participate with the research and/or did not sign the consent form; did not were men who have sex with men.

Were included all participants above 18 years old, who completely answered the questionnaire and signed the consent form.

ETHICS DISCLAIMER:

This study was approved by Faculdade de Odontologia de Bauru Human Research Ethics Committee under CAAE number 50015121.5.0000.5417

RESULTS

A total of 154 individuals were interviewed, of whom approximately 86% were aware (if they had heard about it, knew how to take, knew about side effects) of PrEP. Despite being widely known among participants, only a minority of 11% actually used this product, as can be seen in figure 2. Furthermore, the results presented in figure 2 show that consistent condom use in all sexual encounters is 44.2% among those who would use PrEP, while for those who would not use PrEP, it is 54.2%.

<i>Questions asked to all candidates (154 responses)</i>					
	YES	NO			
Has the candidate heard of PrEP?	133 (86.4%)	21 (13.6%)			
Has the candidate ever used PrEP?	17 (11%)	137 (89%)			
<i>If you USE PrEP (17 responses)</i>					
Have you presented or do you present any STIs during the period in which you have been using	CHART 1				
	Yes, I use condoms in all encounters	Yes, I use them in most encounters	Yes, however, I use them in the minority of encounters	No, I do not use condoms in any encounter	
Do you use condoms, if yes, in all sexual	5 (29.4%)	6 (35.3%)	5 (29.4%)	1 (5.9%)	
<i>If you do not use condoms in all encounters (12 responses)</i>					
	I feel protected by PrEP, safe from STIs	I think it disrupts the relationship	At the moment, I end up forgetting to use it	Another reason	
What is the reason?	3 (25%)	1 (8.3%)	3 (25%)	5 (41.7%)	
<i>If you DO NOT USE PrEP (137 responses)</i>					
Have you ever had (or do you have) any STIs while sexually active?"	CHART 1				
	YES	NO			
Would the candidate use PrEP?	113 (82.5%)	24 (17.5%)			
<i>Question asked to candidates who have never used, but would use PrEP (113 responses)</i>					
	Yes, I use condoms in all encounters	Yes, I use them in most encounters	Yes, however, I use them in the minority of encounters	No, I do not use condoms in any encounter	
Do you use condoms, if yes, in all sexual	50 (44.2%)	48 (42.5%)	12 (10.6%)	3 (2.7%)	
<i>Pergunta para os candidatos não usariam camisinha em todas as relações sexuais (63 respostas)</i>					
	No, I do not use condoms in any encounter	I think it disrupts the relationship	At the moment, I end up forgetting to use it	I think the protection provided by PrEP against AIDS is sufficient	Another reason
What is the reason?	1 (1.6%)	8 (12.7%)	15 (23.8%)	13 (20.6%)	26 (41.3%)
<i>*WOULD NOT USE PrEP (24 responses)</i>					
	Yes, I use condoms in all encounters	Yes, I use them in most encounters	Yes, however, I use them in the minority of encounters	No, I do not use condoms in any encounter	
Do you use condoms, if yes, in all sexual	13 (54.2%)	9 (37.5%)	1 (4.2%)	1 (4.2%)	

Figure 2 - questionnaire answers

Another important factor to note is that 53% of the PrEP users interviewed reported having had some type of STI, while this percentage among those who have never used PrEP is 22%, as shown in figure 3.

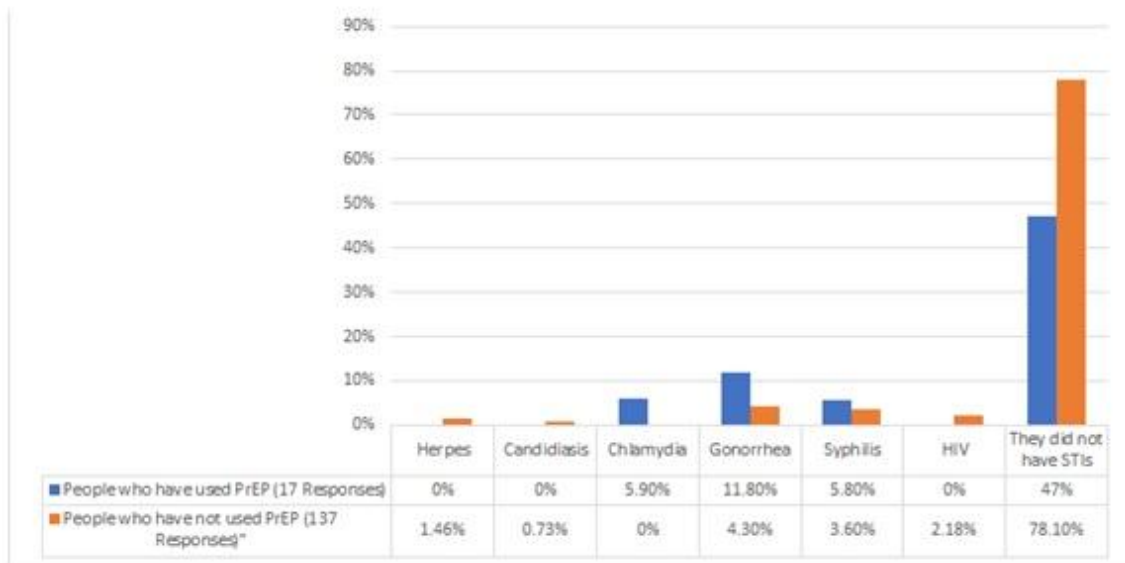


Figure 3 - descriptive data from PrEP use and STIs in the evaluated population.

Finally, another significant finding is that 100% of the respondents who have used or would use PrEP and report consistent condom use in all their sexual encounters stated that they learned that PrEP does not protect them from other STIs.

DISCUSSION

The results underscore a notable lack of informative awareness about PrEP and insufficient distribution of the medication as potential contributors to its low uptake, despite a high percentage of eligible individuals being aware of its existence⁶⁻⁹. This lack of comprehensive understanding leaves the benefits and limitations of PrEP ambiguous to the user, potentially leading to complacency regarding other sexually transmitted infections (STIs)¹⁰⁻¹¹. For instance, the perceived protection against HIV afforded by PrEP may contribute to a relaxation in safer sex practices, such as the consistent use of condoms⁶⁻¹¹.

A 2019 study conducted in San Francisco, utilizing data from the National HIV Behavioral Surveillance between 2004 and 2017, observed an increased risk of non-HIV STIs among men who have sex with men (MSM) during the study period¹². Concurrently, there was a marked rise in PrEP usage—from 9.8% in 2014 to 44.9% in 2017—accompanied by a decline in condom usage, which dropped from 18.5% to 9.4%¹². Similarly, a 2023 German study found that STI rates increased by at least 20% among PrEP users, with

higher frequencies of PrEP use correlating with even greater increases in STI incidence¹³. These findings support the hypothesis that PrEP use, particularly when coupled with inadequate education, may contribute to riskier sexual behaviors, thereby heightening the likelihood of contracting non-HIV STIs¹³.

However, contrasting evidence exists. For example, a 2021 study conducted in the Netherlands did not observe a significant increase in STI rates among PrEP users compared to non-users over a two-year follow-up period¹⁴. This divergence highlights the complex interplay of individual behaviors, public health interventions, and varying contexts in determining the impact of PrEP on STI transmission¹⁴.

An observational cohort study from 2017 that followed transgender individuals and MSM in France and Canada revealed that, over 18 months of PrEP use, the proportion of participants reporting unprotected receptive intercourse increased from 77% to 86%¹⁵. These results further indicate a correlation between PrEP use and declining condom use, a finding consistently observed across multiple studies¹⁵.

When examining condom use specifically, data suggest a nearly 10% reduction in condom usage across all sexual encounters among those on PrEP^{8-10,15}. Many users base their decision not to use condoms on the assumption that PrEP offers sufficient protection, overlooking the risk of other STIs^{8-10,15}. Long-term, this behavioral shift could lead to an increase in cases of syphilis, gonorrhea, and other non-HIV STIs^{8-10,15}.

The tendency to abandon condom use when initiating PrEP appears even more pronounced when examining candidates who express willingness to start PrEP^{2,10-12}. More than half of these individuals reported that they would discontinue condom use in all sexual relationships, falsely assuming that PrEP provides comprehensive protection against all STIs^{2,10-12}. This misperception significantly raises the potential for adverse impacts on sexual health, especially in contexts where educational outreach is insufficient^{2,10-12}.

In terms of STI prevalence, a Brazilian article indicated that the most common STIs among Brazilian men were syphilis, trichomoniasis, and gonorrhea¹⁵. Although no cases of trichomoniasis were reported in the current dataset, syphilis and gonorrhea remained prominent. When comparing PrEP users to non-users, syphilis was found in 11.7% of non-users versus 29.4% of those who had used or were currently using PrEP, representing a 150% increase. Similarly, gonorrhea was present in 4.3% of non-users

but 11.8% of PrEP users, a 160% increase. These figures suggest a strong association between PrEP use and the heightened prevalence of non-HIV STIs, which may be partly attributable to riskier sexual behaviors adopted by some users.

While PrEP is highly effective in preventing HIV transmission, its use is not without potential side effects¹²⁻¹⁴. Common adverse effects include nausea, headache, gastrointestinal disturbances, and renal function decline, particularly in long-term users. Additionally, concerns have been raised about the potential for PrEP to contribute to antimicrobial resistance if used inconsistently¹²⁻¹⁴.

From a public health perspective, the cost of PrEP can also pose a significant barrier to access, particularly in low-resource settings²⁻⁹. Although PrEP is often covered by public health insurance in countries with robust healthcare systems, the high cost of the medication, routine testing, and follow-up care can deter its widespread use in regions with limited healthcare infrastructure²⁻⁹. Furthermore, disparities in access to PrEP are evident across socioeconomic and geographic lines, disproportionately affecting marginalized populations who may be at higher risk of HIV infection²⁻⁹. Ensuring equitable access to PrEP requires targeted public health interventions, subsidies, and comprehensive education campaigns to address both the financial and informational barriers preventing at-risk populations from benefiting fully from this preventative measure²⁻⁹.

One of the key limitations of this study lies in its cross-sectional design, which restricts the ability to infer causality between PrEP use and sexual health outcomes. As data were collected at a single point in time, it is not possible to establish temporal relationships or observe changes in behavior over time. Additionally, the use of dating apps as the primary recruitment platform introduces selection bias, as individuals who use these apps may not be fully representative of the broader MSM population. This reliance on self-reported data also raises concerns about the accuracy and reliability of the responses, particularly when addressing sensitive topics such as sexual behavior. The exclusion of participants who did not fully complete the questionnaire may further contribute to response bias, potentially leading to an underestimation or overestimation of certain behaviors or health outcomes.

Despite these limitations, the study presents several strengths. First, the use of dating apps like Tinder®, Grindr®, and UMatch® for participant recruitment allowed access to a population that might otherwise be difficult to reach through traditional methods,

particularly within a stigmatized group such as MSM. The digital nature of the questionnaire also enabled participants to answer anonymously, which may have encouraged more honest and open responses regarding sensitive sexual health behaviors. Additionally, the study was conducted over a six-month period, capturing a substantial sample size within the MSM community in Bauru and surrounding areas, which enhances the generalizability of the findings to this specific region. Finally, the detailed methodology, including the clear description of inclusion and exclusion criteria, strengthens the study's internal validity by ensuring that only relevant participants were included in the analysis.

CONCLUSION

Based on the results, it can be concluded that while PrEP is effective in preventing AIDS, a lack of awareness about its scope and limitations leads to risky sexual behaviors. Some users and potential users of PrEP refrain from using condoms in all sexual encounters due to a false sense of security, which can increase exposure to non-AIDS STIs. This highlights the need for greater awareness of proper PrEP use, disseminated through media, healthcare centers, and other strategic points. Additionally, linking PrEP awareness with its distribution is crucial to prevent health risks. Given the limited studies on PrEP and associated risks, this research contributes to expanding knowledge on the topic.

STRENGTHS:

A key strength of this study is the use of dating apps as a recruitment tool, which allowed access to a target population that is difficult to reach using traditional methods. This innovative approach facilitates the recruitment of a large number of participants in a short period of time, in addition to ensuring greater representation of the MSM community, given the widespread use of these platforms by this group. Another strength is the digital format of the questionnaires, which provides greater convenience and privacy for participants, reducing the possibility of response bias. The study also presents clear inclusion and exclusion criteria, which increases internal validity by ensuring that only individuals who meet the requirements participate.

LIMITATIONS:

Despite the advantages, the use of dating apps for recruitment has important limitations. First, the participants who respond to the invitation may not be representative of the

entire MSM population, limiting the generalizability of the results. In addition, the "matching" method and the sending of questionnaires may introduce self-selection bias, since only individuals who are more engaged or interested in the topic may choose to participate. Data collection through self-administered questionnaires is also subject to response bias, especially due to the sensitive nature of the topic, which may lead to under- or overestimation of reported behaviors. Finally, the cross-sectional design of the study does not allow establishing causal relationships between PrEP use and the variables of interest.

APPROVAL BY THE HUMAN RESEARCH ETHICS COMMITTEE:

This study was approved by Faculdade de Odontologia de Bauru Human Research Ethics Committee under CAAE number 50015121.5.0000.5417

CONFLICT OF INTEREST:

None

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PARTICIPATION OF EACH AUTHOR:

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