



Original research article

Prevalence and factors associated with sexually transmitted infections among transgender individuals receiving gender-affirming care in Brazil: a cross-sectional study

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Abstract

Introduction: Transgender individuals experience structural inequalities, stigma, and barriers to healthcare, which contribute to a disproportionate burden of sexually transmitted infections (STIs). Evidence on STI occurrence among individuals receiving gender-affirming care remains limited.

Methods: A cross-sectional study was conducted in 2025 at a public gender-affirming outpatient clinic in southeastern Brazil. A convenience sample of 180 transgender individuals completed questionnaires on sociodemographic characteristics, sexual practices, prevention strategies, substance use, and clinical history. Rapid testing for HIV and syphilis was performed. Factors associated with a history of STIs in the previous 12 months were analyzed using hierarchical Poisson regression.

Results: Most participants were younger than 30 years (77.2%), single (87.2%), and had completed at least 12 years of education (94.3%). A history of STIs in the previous 12 months was reported by 21.1% of participants. Awareness and use of PrEP and PEP were limited. Age ≥30 years, transgender woman identity, alcohol use, and PrEP use were independently associated with STI history.

Conclusion: STI vulnerability persists among transgender individuals receiving specialized gender-affirming care and is shaped by structural, contextual, and behavioral factors. Strengthening combined prevention strategies and expanding access to PrEP and PEP are essential to improve sexual health outcomes in this population.

Keywords: HIV; Rapid tests; Sexual health; Sexually transmitted infections; Transgender individuals

Introduction

Sexual health is a central dimension of well-being, encompassing sex, gender identities and expressions, sexual orientation, intimacy, pleasure, and reproduction, and is shaped by biological, psychological, social, cultural, and political factors (Manão et al., 2024; Singh, 2025). Gender refers to socially constructed roles and identities that may not correspond to the sex assigned at birth (Kaufman et al., 2023). Individuals whose gender identity differs from that assigned at birth are described as transgender, including transgender women, transgender men, and nonbinary individuals (Coleman et al., 2022). Gender affirmation may involve social processes and health interventions, such as hormone therapy, which are essential for well-being and quality of life (Coleman et al., 2022).

Despite advances in rights and health policies, transgender individuals continue to experience significant health inequalities driven by structural factors such as stigma, discrimination, and social exclusion (Lima et al., 2023). These conditions affect access to education, employment, and health services, contributing to avoidance of care and reduced engagement in prevention strategies (Ayres et al., 2009; Lima et al., 2023). In this context, vulnerability emerges from the interaction between structural, programmatic, and individual dimensions.

These multilevel vulnerabilities are particularly relevant for sexually transmitted infections (STIs). Transgender individuals are often disproportionately exposed to violence, precarious working conditions, and higher-risk sexual networks, increasing the likelihood of HIV and other STI transmission (Reisner, 2025). Concurrently, barriers to accessing inclusive and culturally competent services may hinder diagnosis and

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continuity of care (Moreno-García et al., 2025; Reisner, 2025). Thus, STI occurrence should be understood as the result of interacting structural, contextual, and behavioral factors.

Globally, STIs remain a major public health challenge, with an estimated 374 million new cases annually among individuals aged 15–49 years (Soghal, 2026; WHO, 2022). Transgender populations, particularly transgender women, present disproportionately higher HIV prevalence (Dourado et al., 2024; Soghal, 2026; UNAIDS, 2024). In Brazil, studies also indicate a high burden of HIV and syphilis, especially in socially marginalized contexts (Dourado et al., 2024).

Public health responses have emphasized combined prevention strategies, including PrEP, PEP, and expanded testing (Cepas et al., 2026; Ministério da Saúde, Brasil, 2023; Sousa et al., 2025). However, uptake among transgender individuals remains limited, reflecting structural barriers and insufficient integration of prevention within health services (Moreno-García et al., 2025; Rocha et al., 2024). Moreover, most studies focus on specific subgroups, with limited evidence on individuals receiving care in gender-affirming services and few analyses adopting multilevel frameworks (Cruz Neto et al., 2024).

Gender-affirming services represent strategic settings for integrating care and prevention, yet their effectiveness in addressing multilevel vulnerabilities remains underexplored (Coleman et al., 2022). Therefore, understanding STI occurrence in this population requires approaches that consider the interaction between structural, contextual, and behavioral determinants.

Thus, this study aimed to analyze the occurrence of sexually transmitted infections among transgender individuals receiving care in a specialized gender-affirming service in Brazil, adopting a multilevel perspective that integrates sociodemographic, behavioral, and clinical factors.

Materials and methods

Study design and setting

This cross-sectional study was conducted in 2025 at a public gender-affirming outpatient clinic in southeastern Brazil. The service provides multidisciplinary care to transgender individuals, including clinical, hormonal, and psychosocial support. The study was approved by the Research Ethics Committee of HCFMRP-USP, and all participants provided written informed consent.

Eligible participants were individuals aged ≥ 18 years who self-identified as transgender and were receiving care at the service during the study period. A nonprobability convenience sample was used, with consecutive recruitment of eligible individuals. Participants with signs of intoxication that could impair comprehension were excluded. Because this study was conducted in a specialized outpatient clinic, all eligible transgender individuals attending the service during the study period were consecutively invited to participate. Therefore, the sample size was determined by the number of eligible individuals available during data collection rather than by a priori sample calculation. The final sample comprised 180 individuals.

Conceptual framework and study variables

The selection and organization of variables were guided by a multilevel conceptual framework of vulnerability, in which the occurrence of sexually transmitted infections (STIs) is understood as the result of interactions between structural, contextual, and behavioral determinants. This framework draws on

theoretical perspectives of social, programmatic, and individual vulnerability, recognizing that health outcomes are shaped by interconnected levels of influence rather than isolated risk factors.

Accordingly, variables were grouped into three hierarchical levels:

Distal (structural) level

This level included sociodemographic characteristics that reflect broader social positioning and structural conditions: age (categorized as <30 and ≥ 30 years), race/ethnicity (self-reported), education level, employment status, income, housing conditions, and gender identity.

Intermediate (contextual/programmatic) level

This level included variables related to access to health services and engagement with preventive strategies: knowledge and use of post-exposure prophylaxis (PEP), knowledge and use of pre-exposure prophylaxis (PrEP), use of other STI prevention methods, and use of gender-affirming hormone therapy (including type of hormone and medical prescription).

Proximal (behavioral) level

This level included individual behaviors associated with STI exposure: alcohol consumption and frequency of use, use of psychoactive substances, smoking, prior experiences of violence (physical, psychological, or sexual), sexual practices, cohabitation with a sexual partner, and consistent condom use.

Clinical variables

Clinical information included a self-reported history of STIs in the past 12 months, prior HIV diagnosis, and the results of rapid tests for HIV, syphilis, and hepatitis B and C performed at the service. These variables were used to characterize participants' health status and complement the interpretation of the main outcome.

Study outcome

The primary outcome was a self-reported history of sexually transmitted infection in the past 12 months, categorized dichotomously (yes/no). This outcome was chosen to capture recent exposure to risk contexts and interaction with health services. Additionally, results from rapid testing for HIV and syphilis were used to contextualize current infection status and support the interpretation of findings.

Data collection procedures

Data collection was conducted before or after participants' appointments at the outpatient clinic, in a private setting to ensure confidentiality and comfort. Two structured instruments were applied: a sociodemographic and behavioral questionnaire and a clinical questionnaire. Complementary data were obtained from medical records (physical and/or electronic) within 15 days of the interview, with participants' consent.

All data were anonymized using numerical codes. Rapid testing for HIV, syphilis, and hepatitis B and C followed institutional protocols. The average duration of data collection, including interview and testing, was approximately 30 minutes per participant. Potential sources of bias, including recall and social desirability bias related to self-reported information, were considered in the interpretation of the results.

Data organization and analysis

Data were entered into Microsoft Excel using a predefined data dictionary and analyzed in SPSS version 21. Descriptive

analyses included absolute and relative frequencies, and the prevalence of HIV, syphilis, and viral hepatitis B and C was estimated with 95% confidence intervals (95% CI). Considering the observed prevalence of sexually transmitted infections (21.1%), the study included 38 outcome events, providing an adequate number of events for the multivariable Poisson regression model, which retained four independent variables in the final analysis. This ratio is consistent with commonly recommended criteria for regression modeling and supports the stability of the estimated associations.

Bivariate associations were assessed using Pearson's chi-square or Fisher's exact test, as appropriate. Variables with $p < 0.20$ and those considered theoretically relevant were included in the multivariate model. Poisson regression with robust variance was used to estimate adjusted prevalence ratios (PR) and 95% CI.

A hierarchical modeling strategy was applied, with variables entered according to their conceptual level (distal, intermediate, and proximal). Variables from higher levels were retained to control for confounding, while subsequent levels were added progressively. Interaction terms were explored, and multicollinearity was assessed using the variance inflation factor (VIF). Statistical significance was set at 5%.

Results

A total of 180 transgender individuals participated (Table 1). Most were under 30 years (77.2%) and single (87.2%). Race/ethnicity was evenly distributed, and heterosexual orientation predominated (66.7%). The sample showed high educational attainment (94.3% with >12 years of schooling). Slightly over half reported home ownership (51.7%). Regarding employment, 57.6% had formal jobs and 37.1% informal work, and most participants reported having an income (97.9%).

Table 2 summarizes behavioral characteristics and STI prevention strategies. Alcohol use was frequent (63.9%), along with smoking (33.9%) and drug use (21.7%), while 38.6% reported experiences of violence. Most participants reported active sexual practices, predominantly including anal intercourse, and did not live with a partner (66.5%). Regular condom use was reported by 53.9%, and about half used additional STI prevention methods.

Table 3 presents the distribution of serological status for syphilis and HIV, recent history of sexually transmitted infections (STIs), current recurrence, and knowledge and use of post-exposure prophylaxis (PEP) and pre-exposure prophylaxis (PrEP) among participants. There was a predominance of negative results for syphilis (93.8%) and HIV (93.9%), as well as a low frequency of self-reported HIV-positive status (5.6%). A history of STIs in the past 12 months was reported by 21.1% of participants, while current recurrence was identified in 4.4% of the sample. Regarding biomedical prevention strategies, 37.2% reported awareness of PEP, although only 9.7% reported using it. Similarly, 33.1% reported awareness of PrEP, while 5.1% reported using it.

Table 4 presents the bivariate analysis of sociodemographic, behavioral, and prevention-related variables and the history of sexually transmitted infections (STIs) in the past 12 months. A higher prevalence of STIs was observed among participants aged ≥ 30 years (36.6% vs. 16.5%; $p = 0.0109$), among those who reported alcohol consumption (26.1% vs. 12.3%; $p = 0.0471$), and among participants who reported sexual practices involving anal and/or oral sex (31.0% vs. 11.6%; $p = 0.0111$). Knowledge of PEP ($p = 0.0001$) and PrEP

Table 1. Distal (structural) characteristics of transgender individuals receiving care at a specialized service ($n = 180$)

Variable and Category	<i>n</i>	%
Gender identity		
Transgender man	89	49.4
Transgender woman	85	47.2
Nonbinary/other	6	3.3
Age (years)		
<30	139	77.2
≥ 30	41	22.8
Race/ethnicity		
White	92	51.1
Non-White	88	48.9
Sexual orientation		
Heterosexual	120	66.7
Non-heterosexual	60	33.3
Marital status		
Single	157	87.2
Common-law union	23	12.8
Education		
<12 years	10	5.7
≥ 12 years	166	94.3
Housing status		
Without home ownership	87	48.3
Home ownership	93	51.7
Employment status		
Formal employment	76	57.6
Informal/self-employed	49	37.1
Not reported	7	5.3
Income		
No income	3	2.1
With income	137	97.9

Note: Some variables have denominators lower than 180 due to nonresponse or because they apply only to subgroups of the sample.

($p = 0.0021$), as well as the use of PrEP ($p = 0.0215$), were also associated with a recent history of STIs. The remaining variables did not show a statistically significant association.

Multivariate analysis using Poisson regression with robust variance identified factors independently associated with a history of sexually transmitted infections (STIs) in the past 12 months (Table 5). Age ≥ 30 years (PR = 1.78; 95% CI: 1.06–3.00; $p = 0.0306$), alcohol use (PR = 1.94; 95% CI: 1.04–3.60; $p = 0.0369$), PrEP use (PR = 1.74; 95% CI: 1.01–3.00; $p = 0.0459$), and gender identity (PR = 2.52; 95% CI: 1.31–4.84; $p = 0.0054$) remained associated with the outcome. The remaining variables did not retain statistically significant associations after adjustment.

To synthesize these findings, Fig. 1 presents the multilevel framework of factors associated with STI occurrence in this population. The model illustrates how structural factors, such as age and gender identity, interact with contextual elements related to access and use of prevention strategies, and with proximal behavioral factors, such as alcohol consumption, in shaping vulnerability to STIs. This integrated perspective highlights that STI risk is not determined by isolated factors, but by the dynamic interaction between different levels of influence, even within a context of specialized care.

Table 2. Proximal (behavioral) characteristics of transgender individuals receiving care at a specialized service

Variable	Category	<i>n</i>	%
Alcohol use	No	64	35.6
	Yes	116	64.4
Frequency of alcohol consumption*	Rarely	44	37.9
	Weekly	34	29.3
	Frequently	38	32.8
Drug use	No	141	78.3
	Yes	39	21.7
Smoking	No	119	66.1
	Yes	61	33.9
History of violence	No	108	61.4
	Yes	68	38.6
Sexual practices	Oral/vaginal sex	69	43.7
	Oral/anal/vaginal sex	87	55.1
	No active sex life	2	1.3
Cohabitation with partner	No	105	66.5
	Yes	53	33.5
Consistent condom use	No	71	46.1
	Yes	83	53.9
Other STI prevention methods	No	80	49.7
	Yes	81	50.3

Note: * Percentages for frequency of alcohol consumption were calculated among participants who reported alcohol use.

Table 3. Intermediate (contextual and clinical) characteristics, including STI status and prevention strategies, among transgender individuals receiving care at a specialized service (*n* = 180)

Variable	Category	<i>n</i>	%
Rapid syphilis test*	Negative	152	93.8
	Positive	10	6.2
Rapid HIV test	Negative	169	99.4
	Positive	1	0.6
Self-reported HIV status	No	170	94.4
	Yes	10	5.6
History of STIs (past 12 months)	No	142	78.9
	Yes	38	21.1
Current STI recurrence	No	172	95.6
	Yes	8	4.4
Knowledge of PEP	No	113	62.8
	Yes	67	37.2
Use of PEP	No	159	90.3
	Yes	17	9.7
Knowledge of PrEP	No	119	66.9
	Yes	59	33.1
Use of PrEP	No	166	94.9
	Yes	9	5.1

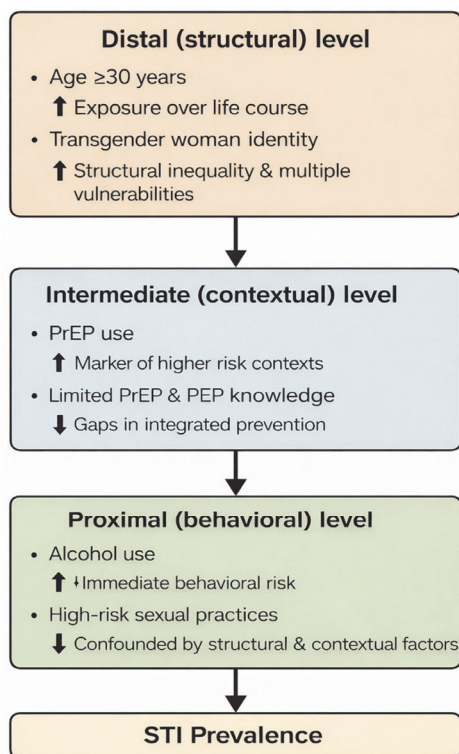
Note: * The total number of participants tested was lower than 180 because individuals with a prior diagnosis of syphilis (*n* = 18) or those already living with HIV (*n* = 10) were not subjected to rapid testing at the time of data collection. Thus, percentages were calculated considering only participants eligible for testing in each case.

Table 4. Bivariate analysis of factors associated with a history of sexually transmitted infections (STIs) in the past 12 months, according to the multilevel conceptual framework (n = 180)

Variable	Category	STI Yes <i>n</i> (%)	STI No <i>n</i> (%)	<i>p</i> -value
DISTAL (STRUCTURAL LEVEL)				
Age	<30 years	23 (16.5)	116 (83.5)	0.0109
	≥30 years	15 (36.6)	26 (63.4)	
Race/ethnicity	Non-White	18 (20.5)	70 (79.5)	0.9773
	White	20 (21.7)	72 (78.3)	
Sexual orientation	Non-heterosexual	8 (13.3)	52 (86.7)	0.1065
	Heterosexual	30 (25.0)	90 (75.0)	
INTERMEDIATE (CONTEXTUAL/PROGRAMMATIC LEVEL)				
Knowledge of PrEP	No	17 (14.3)	102 (85.7)	0.0021
	Yes	21 (35.6)	38 (64.4)	
Use of PrEP	No	32 (19.3)	134 (80.7)	0.0215
	Yes	5 (55.6)	4 (44.4)	
Knowledge of PEP	No	13 (11.5)	100 (88.5)	0.0001
	Yes	25 (37.3)	42 (62.7)	
Hormone use	No	5 (13.9)	31 (86.1)	0.3108
	Yes	33 (23.4)	108 (76.6)	
Other STI prevention methods	No	12 (15.0)	68 (85.0)	0.0776
	Yes	23 (28.4)	58 (71.6)	
PROXIMAL (BEHAVIORAL LEVEL)				
Alcohol use	No	8 (12.3)	57 (87.7)	0.0471
	Yes	30 (26.1)	85 (73.9)	
Drug use	No	26 (18.4)	115 (81.6)	0.1476
	Yes	12 (30.8)	27 (69.2)	
Smoking	No	27 (22.7)	92 (77.3)	0.5950
	Yes	11 (18.0)	50 (82.0)	
History of violence	No	20 (18.5)	88 (81.5)	0.5415
	Yes	16 (23.5)	52 (76.5)	
Sexual practices	Oral/vaginal	8 (11.6)	61 (88.4)	0.0111
	Oral/anal	27 (31.0)	60 (69.0)	
	No active sex life	–	2 (100.0)	
Cohabitation with partner	No	27 (25.7)	78 (74.3)	0.3008
	Yes	9 (17.0)	44 (83.0)	
Consistent condom use	No	14 (19.7)	57 (80.3)	0.4231
	Yes	22 (26.5)	61 (73.5)	

Table 5. Hierarchical multivariate analysis of factors associated with a history of sexually transmitted infections (STIs) in the past 12 months, according to a multilevel conceptual framework ($n = 180$)

Variable	Category	Adjusted PR	95% CI	<i>p</i> -value
DISTAL (STRUCTURAL LEVEL)				
Age	≥30 years (ref.: <30 years)	1.78	1.06–3.00	0.031
Gender identity	Transgender woman (ref.: Transgender man)	2.52	1.31–4.84	0.005
INTERMEDIATE (CONTEXTUAL/PROGRAMMATIC LEVEL)				
Use of PrEP	Yes (ref.: No)	1.74	1.01–3.00	0.046
Knowledge of PrEP	Yes (ref.: No)	1.29	0.58–2.89	0.532
Knowledge of PEP	Yes (ref.: No)	1.35	0.62–2.93	0.445
PROXIMAL (BEHAVIORAL LEVEL)				
Alcohol use	Yes (ref.: No)	1.94	1.04–3.60	0.037
Sexual practices	Anal/oral (ref.: oral/vaginal)	0.91	0.38–2.19	0.837

**Fig. 1.** Multilevel framework of factors associated with the occurrence of sexually transmitted infections (STIs) among transgender individuals receiving care in a specialized gender-affirming service ($n = 180$)

Discussion

This study analyzed STI occurrence among transgender individuals receiving care in a specialized gender-affirming service, adopting a multilevel perspective integrating structural, contextual, and behavioral determinants. The findings indicate that STI vulnerability persists even within a context of institutional follow-up and access to care, shaped by interactions across different levels of influence. The hierarchical analysis reinforces the need to move beyond individual-level

explanations toward more comprehensive frameworks. This interpretation is consistent with contemporary models that conceptualize HIV and STI vulnerability among transgender and gender-diverse populations as the result of interconnected structural, social, and behavioral processes. Rather than viewing STI occurrence solely as the consequence of individual risk behaviors, these frameworks emphasize how stigma, discrimination, socioeconomic exclusion, and barriers to healthcare shape exposure and access to prevention resources (Reisner, 2025).

At the structural level, age ≥30 years was associated with higher STI prevalence, suggesting cumulative exposure over the life course. Although the sample was predominantly young, this finding indicates that vulnerability may increase over time due to continued exposure to diverse sexual networks and structural constraints. Previous studies highlight that prolonged exposure to discrimination and unstable access to care intensifies risk trajectories (Baggaley et al., 2010; Patel et al., 2014). Age may therefore be interpreted not only as a chronological characteristic but also as a marker of cumulative social and epidemiological exposure, reflecting longer trajectories of vulnerability and unequal access to prevention and healthcare services.

Gender identity also emerged as a key determinant, with transgender women showing higher STI prevalence than transgender men. This aligns with evidence of disproportionate HIV/STI burden among transgender women globally (Stutterheim et al., 2021; Van Gerwen et al., 2020). These disparities reflect structural processes such as stigma, violence, and socioeconomic marginalization rather than individual behaviors alone. In Brazil, such inequalities are particularly pronounced among travestis and transgender women (Bastos et al., 2018; Grinsztejn et al., 2017). Recent national findings from the TransOdara study reinforce this interpretation, documenting a high prevalence of HIV and syphilis among transgender women and travestis, particularly among those experiencing socioeconomic vulnerability and engagement in sex work (Dourado et al., 2024; Rocha et al., 2024). Together, these findings suggest that the observed disparities are rooted in structural inequities that shape exposure opportunities and access to prevention rather than in gender identity itself.

At the contextual level, the association between PrEP use and STI history likely reflects risk stratification rather than causality. Individuals with greater exposure to high-risk sexual networks are more likely to access or be referred to PrEP.

This interpretation is consistent with studies showing higher STI diagnosis rates among PrEP users due to both increased exposure and more frequent testing (Grinsztejn et al., 2017; Moreno-García et al., 2025). Therefore, PrEP use should be interpreted as a marker of vulnerability and engagement with prevention services rather than evidence of increased STI risk attributable to PrEP itself.

At the behavioral level, alcohol consumption remained associated with STI occurrence, supporting its role as a mediator of risk. Alcohol may impair decision-making and reduce the negotiation of safer sexual practices, increasing exposure (Baggaley et al., 2010). Among transgender individuals, alcohol use may also reflect coping responses to minority stress, discrimination, and social exclusion, illustrating how behavioral factors are frequently embedded within broader psychosocial and structural contexts (Reisner, 2025).

Although sexual practices were associated with STI history in bivariate analyses, they did not remain significant after adjustment, suggesting mediation by broader structural and contextual factors. This finding supports moving beyond behavior-centered explanations, although the high prevalence of anal intercourse remains epidemiologically relevant given its higher transmission risk (Baggaley et al., 2010; Patel et al., 2014). Recent public health perspectives have emphasized that effective STI prevention requires addressing healthcare accessibility, stigma, and social determinants of health in addition to promoting individual behavior change (Ong et al., 2025).

Importantly, STI vulnerability persisted despite engagement in gender-affirming care. The low uptake of PrEP and PEP indicates gaps in integrating prevention into routine services. Access alone may be insufficient without systematic incorporation of combined prevention strategies, particularly in the presence of stigma and limited culturally competent care (Moreno-García et al., 2025). Evidence from Brazil suggests that LGBTQIA+ populations continue to experience institutional barriers and discrimination within healthcare settings, which may compromise the effectiveness of prevention efforts even when services are available (Cepas et al., 2026).

Public health implications

The findings support the adoption of multilevel approaches to STI prevention among transgender populations. Interventions focused exclusively on individual behaviors are unlikely to substantially reduce STI burden if structural vulnerabilities remain unaddressed. Gender-affirming services represent strategic settings for integrating STI testing, counseling, PrEP and PEP delivery, and linkage to care. Expanding culturally competent healthcare, reducing stigma within services, and strengthening combined prevention strategies may contribute to reducing health inequities and improving sexual health outcomes among transgender individuals. These recommendations are aligned with recent calls for integrated and structural approaches to STI control that extend beyond behavior-focused interventions (Ong et al., 2025; Reisner, 2025).

Limitations

This study has limitations that should be considered when interpreting the findings. The cross-sectional design precludes causal inference, and the use of a convenience sample from a single specialized service may limit generalizability to transgender populations not engaged in care. Additionally, some variables relied on self-reported information and may be subject to recall or social desirability bias. The relatively small sample size may have reduced statistical power to detect associations with less frequent outcomes. Finally, the low prevalence

of HIV and absence of viral hepatitis should be interpreted cautiously, as these findings may reflect both engagement in care and limitations related to sample size and study design. Nevertheless, the study provides important evidence on STI vulnerability within a population that remains underrepresented in the literature, highlighting the value of multilevel analytical approaches for understanding sexual health inequities among transgender individuals.

Conclusion

This study identified that the occurrence of sexually transmitted infections among transgender individuals receiving gender-affirming care is associated with multilevel determinants, including structural factors (age and gender identity), contextual elements related to prevention strategies, and behavioral factors such as alcohol use. These findings highlight that STI vulnerability persists even within specialized care settings and is shaped by the interaction between social, programmatic, and individual dimensions. Strengthening combined prevention strategies, expanding access to PrEP and PEP, and integrating these interventions into gender-affirming services are essential to reduce health inequities and improve sexual health outcomes in this population.

Data availability statement

Data supporting the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to ethical and privacy restrictions involving human participants.

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Conflict of interest

The authors have no conflict of interest to declare.

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