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Original Research Article

Prevalence of HIV/AIDS among Transgender People in Three Big Cities of Punjab, Pakistan

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Abstract: *HIV/AIDS remains a major public health concern among transgender populations due to the combined effects of social exclusion, stigma, limited healthcare access, unsafe sexual practices, and poor HIV testing coverage. In Pakistan, city-level evidence on HIV burden among transgender communities is still limited.* ***Objective:*** *To determine the prevalence of HIV/AIDS and assess related sociodemographic, behavioral, awareness, and healthcare-access factors among transgender individuals in Punjab, Pakistan.* ***Methods:*** *This descriptive cross-sectional study included 150 transgender participants from various cities in Punjab, Pakistan, from January 2025 to December 2025. Participants were recruited through healthcare facilities, HIV treatment centers, community outreach activities, and transgender support organizations using a non-probability convenience sampling technique. Data were collected through a structured questionnaire, available medical records, and HIV testing reports. Information was obtained regarding demographic characteristics, HIV awareness, sexual behavior, condom use, sex work, injectable drug use, needle sharing, healthcare access, discrimination, HIV testing history, and HIV test results. Data were analyzed using SPSS version 27. Categorical variables were presented as frequencies and percentages. Associations between HIV test result category and selected variables were assessed using Pearson's chi-square test, with $p<0.05$ considered statistically significant.* ***Results:*** *Among 150 transgender participants, the highest proportion was in the 35–44-year age group (41; 27.3%), followed by the 25–34-year age group (40; 26.7%). Gender identity included transgender women (41, 27.3%), Khawaja Sira (40, 26.7%), other gender identities (40, 26.7%), and transgender men (29, 19.3%). Overall, 117 (78.0%) participants had heard about HIV/AIDS, but only 46 (30.7%) knew that condom use can prevent HIV transmission. A history of sexual intercourse was reported by 131 (87.3%) participants, 51 (34.0%) had more than five sexual partners in the previous six months, 50 (33.3%) never used condoms, and 62 (41.3%) were involved in sex work. 29 (19.3%) participants reported injectable drug use and needle sharing by 15 (10.0%). Overall, 90 (60.0%) participants had ever been tested for HIV. HIV positivity was 33/150 (22.0%) in the full sample, 33/90 (36.7%) among ever-tested respondents, and 33/65 (50.8%) among those with known positive or negative results. Knowledge of HIV testing services ($\chi^2=14.797$, $p=0.002$), injectable drug use ($\chi^2=12.125$, $p=0.007$), HIV testing status ($p<0.001$), and time since last HIV test ($p<0.001$) were significantly associated with HIV test-result category.* ***Conclusion:*** *A considerable burden of HIV/AIDS was observed among transgender participants in Punjab, particularly among those with available HIV test results. Limited condom-related knowledge, inconsistent condom use, multiple sexual partners, sex work, injectable drug use, poor healthcare access, and discrimination indicate the need for transgender-friendly HIV prevention, confidential testing, harm-reduction services, and effective linkage to care.*

Keywords: HIV Infections; Transgender Persons; Cross-Sectional Studies

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Introduction

HIV/AIDS remains a major public health concern among transgender populations because the burden of infection is shaped by intersecting biological, behavioural, social, and structural vulnerabilities. Transgender persons, particularly transgender women and traditional South Asian Khawaja Sira communities, frequently experience social exclusion, unstable housing, limited education, economic dependence, sexual exploitation, and reduced access to respectful healthcare. These factors increase exposure to unprotected sexual activity, delayed HIV testing, untreated sexually transmitted infections, and poor linkage to prevention and treatment services. An updated global systematic review by Stutterheim et al. reported a standardized HIV prevalence of 19.9% among trans feminine individuals and 2.56% among trans masculine individuals, highlighting a disproportionate global burden of HIV in transgender communities (1). A more recent meta-analysis by Moradi et al. reported an overall pooled HIV/AIDS prevalence of 24% among transgender populations worldwide, with particularly high estimates in transfeminine populations from Asian settings (2).

In Pakistan, HIV has historically followed a concentrated epidemic pattern, with higher transmission among key populations, including people who inject drugs, sex workers, men who have sex with men, and transgender persons. Ali Shah et al. conducted community-based TB and HIV screening among transgender women and male sex workers in Pakistan. They found that transgender women had a substantial HIV burden, while acceptance of HIV testing remained low compared with male sex workers (3). Shah et al. reported HIV and syphilis-related vulnerability among transgender individuals in Sindh, showing that sexually transmitted infections and HIV overlap in marginalized sexual networks (4). These findings suggest that transgender populations in Pakistan are not only exposed to HIV through individual-level risk behaviours but also through poor service coverage, low confidentiality, and limited community-sensitive outreach.

Condom use remains one of the most accessible HIV-prevention measures. Yet, consistent condom use is often constrained by poverty, power imbalance, client pressure, substance use, low perceived risk, and poor access to prevention education. Bano et al. described inconsistent condom use among street-based transgender sex workers in Lahore. They showed that condom negotiation was shaped by interpersonal, social, and structural barriers rather than knowledge alone (5). Health-system exclusion further worsens HIV vulnerability. Manzoor et al. reported that transgender persons in Lahore experienced multiple barriers to healthcare, including poor-quality services, unaffordability, shame, and the absence of identity documents (6). Ahmad et al. demonstrated through a field

experiment that transgender patients in Pakistan may receive different and lower-quality care in routine clinical settings (7). Jadoon et al. further documented healthcare access barriers among transwomen in Pakistan, including discrimination, cost, poor provider attitudes, and lack of inclusive facilities (8).

HIV testing is central to early diagnosis, treatment initiation, viral suppression, and prevention of further transmission. However, testing uptake among transgender communities remains variable across settings. Sok et al. reported that only 49.2% of transgender women in Cambodia had recent HIV testing, and testing was more likely among those exposed to community-based services and HIV education (9). Lee et al. reported substantial HIV prevalence and ongoing prevention gaps among transgender women in seven urban areas of the United States, emphasizing the need for targeted prevention and healthcare access (10). These international and regional data indicate that HIV risk among transgender persons is not explained by behaviour alone; it is strongly linked to social exclusion, stigma, discrimination, and insufficiently tailored health services.

In the Pakistani context, transgender communities continue to face social marginalization, economic insecurity, and healthcare discrimination despite legal recognition of gender identity. Punjab is the most populous province of Pakistan, and its large urban centres attract transgender persons for work, social networks, begging, dancing, and sex work. However, reliable city-level data on HIV prevalence, testing history, condom awareness, and healthcare access among transgender persons in Punjab remain limited. The present study was therefore conducted to estimate the prevalence of HIV/AIDS among transgender respondents in selected cities of Punjab, Pakistan, and to identify associated awareness, behavioural, and healthcare-related factors. The findings may help strengthen transgender-friendly HIV screening, prevention education, harm-reduction services, and confidential linkage to care in Punjab.

Methodology

This quantitative descriptive cross-sectional study was conducted to determine the prevalence of HIV/AIDS and associated sociodemographic, behavioral, and healthcare-related factors among transgender individuals in Punjab, Pakistan. The study was carried out in major urban centers of Punjab, including Lahore, Faisalabad, and Multan, because these cities have a relatively higher concentration of transgender communities and established healthcare facilities providing HIV testing, counseling, and treatment services. Data were collected in collaboration with selected public and private healthcare facilities, HIV/AIDS treatment centers, and community-based organizations working with transgender populations.

A total of 150 transgender participants were included in the study using a non-probability convenience sampling technique. This sampling approach was considered appropriate because transgender individuals are often difficult to reach through conventional probability-based sampling methods due to stigma, social exclusion, and limited healthcare engagement. Participants were recruited through healthcare facilities, HIV treatment centers, community outreach activities, and transgender support organizations. Eligible participants were individuals who self-identified as transgender, were aged 18 years or above, were living in Punjab, and provided informed consent. Individuals who did not identify as transgender, were younger than 18 years, or had incomplete survey responses were excluded from the analysis.

Data were collected using a structured questionnaire, review of medical records, and available HIV testing reports. The questionnaire was designed to obtain information on demographic characteristics, including age, gender identity, education level, employment status, and monthly income. It also assessed HIV-related awareness, knowledge of HIV transmission and prevention, knowledge of HIV testing services, sexual behavior, number of sexual partners, condom use, involvement in sex work, injectable drug use, needle-sharing practices, access to healthcare services, previous HIV testing, exposure to HIV/AIDS awareness education, and experiences of stigma or discrimination in healthcare settings.

Clinical and laboratory information was obtained from available medical records and HIV testing reports where accessible. These records were reviewed to verify HIV status, history of HIV diagnosis, treatment status, use of antiretroviral therapy, presence of opportunistic infections, frequency of healthcare visits, CD4 cell count, viral load, where available, and diagnostic test findings. HIV test result status was categorized as positive, negative, preferred not to disclose, or not tested/not available. The use of questionnaire-based information, medical record review, and laboratory report assessment helped improve the completeness and reliability of the collected data.

The primary outcome variable was HIV test result status among transgender participants. The main explanatory variables included age group, gender identity, education, employment status, income, sexual activity, number of sexual partners, condom use, involvement in sex work, injectable drug use, needle sharing, awareness of HIV/AIDS, awareness of HIV testing services, access to healthcare, and discrimination in healthcare settings. The study also assessed preventive and risk-related factors such as lack of condom use, multiple sexual partners, substance or injection drug use, limited access to prevention services, lack of health education, social stigma, and economic vulnerability.

Data were checked for completeness and consistency before analysis. Statistical analysis was performed using SPSS version 27. Categorical variables were summarized as frequencies and percentages. HIV prevalence was calculated using the total number of participants as the denominator and was also described among participants with available HIV test results where appropriate. Cross-tabulation was used to examine the distribution of HIV test result categories across demographic, behavioral, and healthcare-related variables. Pearson's chi-square test was used to assess associations between HIV test results and selected categorical variables. Fisher's exact test was used when the expected cell counts were small. A p-value of less than 0.05 was considered statistically significant. As the study used a cross-sectional design, statistically significant associations were interpreted as associations only, and no causal inferences were made.

Ethical approval was obtained from the relevant institutional review board before data collection. Written or verbal informed consent was obtained from all participants after explaining the purpose of the study, the voluntary nature of participation, and the right to withdraw at any stage without any penalty. Confidentiality and anonymity were strictly maintained throughout the study. Personal identifiers were not used in the analysis, and all information related to HIV status, gender identity, sexual behavior, and healthcare experiences was handled with strict privacy. The collected data were used only for academic and research purposes.

Results

A total of 150 completed responses from transgender participants in Punjab were included in the final analysis. Participants were recruited from different cities, including Sheikhupura 20 (13.3%), Sialkot 19 (12.7%), Rawalpindi 18 (12.0%), Lahore 17 (11.3%), Rahim Yar Khan 17 (11.3%), Bahawalpur 15 (10.0%), Sargodha 13 (8.7%), Multan 12 (8.0%), Gujranwala 10 (6.7%), and Faisalabad 9 (6.0%). The age distribution was relatively balanced, with the highest proportion aged 35–44 years (41; 27.3%), followed by 25–34 years (40; 26.7%), 18–24 years (38; 25.3%), and 45 years or above (31; 20.7%). Gender identity was distributed as transgender women (41, 27.3%), Khawaja Sira (40, 26.7%), other gender identities (40, 26.7%), and transgender men (29, 19.3%) (Table 1).

Table 1. Sociodemographic and economic characteristics of respondents, n = 150

Variable	Category	n (%)
Age group		
	18–24 years	38 (25.3)
	25–34 years	40 (26.7)
	35–44 years	41 (27.3)
	≥45 years	31 (20.7)
City		
	Bahawalpur	**15 (10.0)**
	Faisalabad	9 (6.0)
	Gujranwala	10 (6.7)
	Lahore	17 (11.3)
	Multan	12 (8.0)
	Rahim Yar Khan	17 (11.3)
	Rawalpindi	18 (12.0)
	Sargodha	13 (8.7)
	Sheikhupura	20 (13.3)
	Sialkot	19 (12.7)
Gender identity		
	Transgender man	29 (19.3)
	Transgender woman	41 (27.3)
	Khawaja Sira	40 (26.7)
	Other	40 (26.7)
Education		
	No formal education	29 (19.3)
	Primary	41 (27.3)
	Secondary	43 (28.7)
	College/University	37 (24.7)
Employment status		
	Unemployed	23 (15.3)
	Sex work	37 (24.7)
	Private job	28 (18.7)
	Self-employed	27 (18.0)
	Other	35 (23.3)
Monthly income		
	<20,000 PKR	40 (26.7)
	20,000–40,000 PKR	40 (26.7)
	40,000–60,000 PKR	28 (18.7)
	>60,000 PKR	42 (28.0)

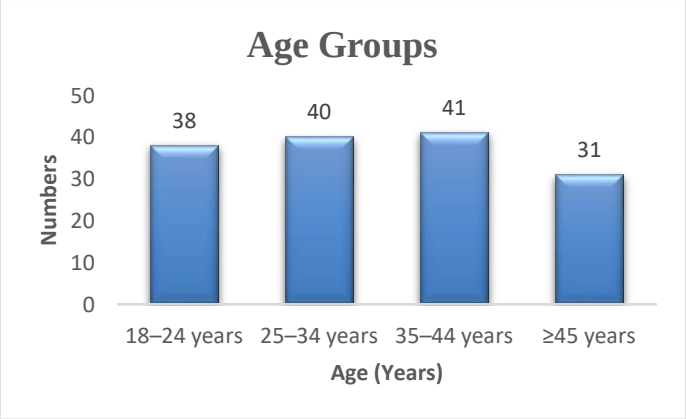

Figure 1: Age distribution of study Population

Regarding education, 43 (28.7%) respondents had secondary education, 41 (27.3%) had primary education, 37 (24.7%) had college or university education, while 29 (19.3%) had no formal education. Employment patterns showed that 37 (24.7%) were involved in sex work, 35 (23.3%) reported other occupations, 28 (18.7%) were in private jobs, 27 (18.0%) were self-employed, and 23 (15.3%) were unemployed. Monthly income was distributed across categories: 42 (28.0%) earned more than 60,000 PKR per month, while 40 (26.7%) each reported income below 20,000 PKR and between 20,000–40,000 PKR (Table 1).

Most respondents had heard about HIV/AIDS 117 (78.0%), and the same proportion reported knowledge of multiple transmission methods. However, correct knowledge regarding condom-based HIV prevention was limited: only 46 (30.7%) respondents knew that condom use can prevent HIV transmission, while 50 (33.3%) answered "No" and 54 (36.0%) were not sure. 81 (54.0%) participants reported awareness of HIV testing services, whereas 69 (46.0%) were unaware of testing services (Table 2)

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Table 2. HIV awareness, healthcare access, and risk-related characteristics, n = 150

Variable	Category	n (%)
Heard about HIV/AIDS	Yes	117 (78.0)
	No	33 (22.0)
Knowledge of HIV transmission	Multiple methods known	117 (78.0)
	Do not know	33 (22.0)
Knows condoms can prevent HIV	Yes	46 (30.7)
	No	50 (33.3)
	Not sure	54 (36.0)
Knows HIV testing services	Yes	81 (54.0)
	No	69 (46.0)
Ever had sexual intercourse.	Yes	131 (87.3)
	No	19 (12.7)
Sexual partners in the last 6 months	1 partner	54 (36.0)
	2–5 partners	45 (30.0)
	>5 partners	51 (34.0)
Condom use during sexual activity	Always	63 (42.0)
	Sometimes	37 (24.7)
	Never	50 (33.3)
Involved in sex work	Yes	62 (41.3)
	No	88 (58.7)
Injectable drug use	Yes	29 (19.3)
	No	121 (80.7)
Shared needles	Yes	15 (10.0)
	No	135 (90.0)
Access to healthcare	Yes	68 (45.3)
	No	82 (54.7)
Faced discrimination in healthcare	Yes	76 (50.7)
	No	74 (49.3)
Received HIV/AIDS awareness education	Yes	72 (48.0)
	No	78 (52.0)
NGO-based HIV awareness exposure	Yes	63 (42.0)
	No	87 (58.0)
Willing to participate in prevention programs	Yes	79 (52.7)
	No	71 (47.3)

Sexual risk-related characteristics showed that 131 (87.3%) respondents had a history of sexual intercourse. During the preceding six months, 54 (36.0%) reported one sexual partner, 45 (30.0%) reported 2–5 partners, and 51 (34.0%) reported more than five partners. Condom use was inconsistent: 63 (42.0%) always used condoms, 37 (24.7%) used condoms sometimes, and 50 (33.3%) never used condoms. Overall, 62 (41.3%) respondents reported involvement in sex work, 29 (19.3%) reported injectable drug use, and 15 (10.0%) reported needle sharing. Healthcare access remained limited, with 82 (54.7%) reporting no access to healthcare services. Discrimination in healthcare settings was reported by 76 (50.7%) participants (Table 2).

Among all respondents, 90 (60.0%) had ever been tested for HIV, while 60 (40.0%) had never been tested. The last HIV test was within the previous six months in 35 (23.3%) respondents, 6–12 months ago in 26 (17.3%), and more than one year ago in 29 (19.3%). Based on the recorded or self-reported test results, 33 (22.0%) participants were HIV positive, 32 (21.3%) were HIV negative, 25 (16.7%) preferred not to disclose their result, and 60 (40.0%) were classified as not tested/N/A. The reported HIV-positive proportion in the full sample was therefore 22.0%. Among respondents with a known positive or negative result, HIV positivity was 33/65 (50.8%), while among those ever tested, positivity was 33/90 (36.7%) (Table 3).

Table 3. HIV testing history and reported HIV test results

Indicator	Calculation	Result
Total respondents analyzed	Completed responses	150
Ever tested for HIV	90/150	60.0%
Never tested for HIV	60/150	40.0%
Tested within the last 6 months	35/150	23.3%
Tested 6–12 months ago	26/150	17.3%
Tested more than 1 year ago	29/150	19.3%
HIV positive in the full sample	33/150	22.0%
HIV negative in the full sample	32/150	21.3%
Preferred not to disclose the result	25/150	16.7%

Not tested/N/A	60/150	40.0%
HIV positivity among known positive/negative results	33/65	50.8%
HIV positivity among ever-tested respondents	33/90	36.7%

A Pearson chi-square analysis was performed to assess associations between selected variables and HIV test result categories. Four variables showed statistically significant associations with HIV test result category: knowledge of HIV testing services, injectable drug use, HIV testing status, and time since last HIV test. Knowledge of HIV testing services was significantly associated with HIV test result category ($\chi^2 = 14.797$, df = 3, p = 0.002). Injectable drug use was also significantly associated with HIV test result category ($\chi^2 = 12.125$, df = 3, p = 0.007). HIV testing status and time since last HIV test were strongly associated with HIV test result category, both with p-values <0.001; however, these findings should be interpreted as testing-process associations because participants who had never been tested were classified as N/A (Table 4).

Table 4. Significant Pearson chi-square associations with HIV test result category

Variable	χ^2	df	p-value	Interpretation
Knowledge of HIV testing services	14.797	3	0.002	Significant
Injectable drug use	12.125	3	0.007	Significant
Ever tested for HIV	150.000	3	<0.001	Significant
Time since last HIV test	152.818	9	<0.001	Significant

Cross-tabulation showed that among respondents who knew about HIV testing services, 17 (21.0%) were HIV positive, 13 (16.0%) were HIV negative, 22 (27.2%) preferred not to disclose their result, and 29 (35.8%) were N/A. Among those who did not know about testing services, 16 (23.2%) were HIV positive, 19 (27.5%) were HIV negative, 3 (4.3%) preferred not to disclose, and 31 (44.9%) were N/A. The higher N/A proportion among respondents unaware of testing services suggests that a lack of service awareness may contribute to incomplete testing coverage and unavailable test results (Table 5).

Table 5. Cross-tabulation of significant variables with HIV test result category

Variable	Category	Positive n (%)	Negative n (%)	Prefer not n (%)	N/A n (%)	Total
Knowledge of HIV testing services	Yes	17 (21.0)	13 (16.0)	22 (27.2)	29 (35.8)	81
	No	16 (23.2)	19 (27.5)	3 (4.3)	31 (44.9)	69
Injectable drug use	Yes	6 (20.7)	4 (13.8)	11 (37.9)	8 (27.6)	29
	No	27 (22.3)	28 (23.1)	14 (11.6)	52 (43.0)	121
Ever tested for HIV	Yes	33 (36.7)	32 (35.6)	25 (27.8)	0 (0.0)	90
	No	0 (0.0)	0 (0.0)	0 (0.0)	60 (100.0)	60
Time since last HIV test	Within the last 6 months	12 (34.3)	12 (34.3)	11 (31.4)	0 (0.0)	35
	6–12 months ago	8 (30.8)	10 (38.5)	8 (30.8)	0 (0.0)	26
	More than 1 year ago	13 (44.8)	10 (34.5)	6 (20.7)	0 (0.0)	29
	Never tested	0 (0.0)	0 (0.0)	0 (0.0)	60 (100.0)	60

Among respondents reporting injectable drug use, 6 (20.7%) were HIV positive, 4 (13.8%) were negative, 11 (37.9%) preferred not to disclose their result, and 8 (27.6%) were N/A. Among those who did not report injectable drug use, 27 (22.3%) were HIV positive, 28 (23.1%) were negative, 14 (11.6%) preferred not to disclose, and 52 (43.0%) were N/A. Although the proportion of recorded HIV positivity was similar between injectable drug users and non-users, the higher proportion of non-disclosure among injectable drug users indicates a meaningful difference in the overall distribution of HIV test result categories (Table 5).

Testing-related variables showed the strongest associations with the HIV test result category. All respondents who had never been tested were recorded as N/A, whereas those who had been tested had positive, negative, or undisclosed results. Among respondents tested more than one year ago, 13 (44.8%) were HIV positive, compared with 12 (34.3%) among those tested within the last six months and 8 (30.8%) among those tested 6–12 months ago. These findings support the need for repeated HIV screening, confidential disclosure mechanisms, and transgender-friendly testing services, particularly for respondents with ongoing behavioral or structural risk exposure.

Discussion

In this multicity sample of 150 transgender respondents from Punjab, the recorded HIV-positive proportion was 22.0% in the full sample, 36.7% among ever-tested respondents, and 50.8% among those with known positive or negative results. This prevalence is clinically important and falls within the high-risk range reported internationally. Chiu et al. reported HIV infection in 42.3% of transgender women in San Francisco, where incarceration, injection drug use, and coexisting hepatitis C were common (11). Reisner et al. reported 33.6% HIV seropositivity among young transgender women in Lima, Peru, with 50.7% reporting recent sex work and 42.0% reporting recent condomless sex (12). The lower full-sample prevalence in our study may reflect the inclusion of untested and undisclosed participants. At the same time, the higher positivity among known results suggests possible concentration of testing among higher-risk individuals.

The sexual-risk profile of our respondents was substantial. Overall, 87.3% had ever had sexual intercourse, 34.0% reported more than five sexual partners in the last six months, 41.3% reported involvement in sex work, and 33.3% never used condoms. Xia et al. reported condomless anal sex in 30.8% of transgender women in two Chinese cities and found associations with low self-esteem, sexual compulsivity, and intimate partner violence (13). In our study, only 30.7% knew that condoms can prevent HIV, showing that prevention knowledge was weaker than the observed level of sexual exposure. Morris et al. similarly emphasized that PrEP discussion and use remain inadequate among transgender women despite high HIV vulnerability (14). These comparisons indicate that condom promotion alone may be insufficient unless paired with peer-led counselling, PrEP education, and confidential prevention services.

Injection-related risk also contributed to the overall risk profile. Injectable drug use was reported by 19.3% of respondents, needle sharing by 10.0%, and injectable drug use was significantly associated with HIV test result category ($\chi^2 = 12.125$, p = 0.007). Hershow et al. showed that structural and psychosocial syndemic conditions were associated with condomless

anal intercourse among transgender women in the United States (15). In our study, the HIV-positive proportion was similar between injectable drug users and non-users, but non-disclosure was much higher among injectable drug users (37.9% vs. 11.6%). This pattern suggests that stigma, fear, or confidentiality concerns may obscure the real burden of HIV among respondents with drug-related risk.

Testing coverage remained incomplete. Although 60.0% had ever been tested, 40.0% had never been tested, and knowledge of HIV testing services was significantly associated with test result category (χ^2 = 14.797, p = 0.002). Baugher et al. reported that seven in ten transgender women experienced at least one type of discrimination in the previous year, which was linked with poorer access to healthcare (16). In our sample, 54.7% reported no healthcare access, and 50.7% reported discrimination in healthcare settings, supporting the view that missed testing is partly structural rather than solely due to individual refusal.

The testing-process variables showed the strongest statistical associations: ever tested for HIV and time since last HIV test were both associated with HIV test result category at p<0.001. These results should be interpreted cautiously because never-tested respondents were automatically classified as N/A. Goldhammer et al. reviewed HIV care-continuum interventions for transgender women and concluded that effective approaches often require addressing stigma, linkage barriers, and culturally tailored service delivery (17). Becasen et al. found that among transgender women living with HIV, 82% had ever received HIV care, 72% were receiving care, and 62% were virally suppressed, indicating persistent gaps even after diagnosis (18). Jongen et al. similarly reported that viral suppression among transgender women in the Netherlands remained below 90% in 2021, with late presentation and disengagement from care still present (19).

The present findings support integrated HIV services for transgender communities in Punjab, including repeat testing, confidential disclosure mechanisms, condom and PrEP education, harm-reduction services, and linkage to antiretroviral therapy. Rodriguez et al. reported that 67% of transgender and non-binary adolescents and young adults were aware of PrEP, but only 7% had been prescribed it (20). Moreno-García et al. reported low PrEP and PEP use among transgender and non-binary persons in Spain despite moderate awareness, demonstrating that knowledge does not automatically translate into access (21). Hussain et al. reported compromised quality of life among HIV-positive transgender and homosexual persons in Karachi, further emphasizing the need for services that address both HIV and social vulnerability (22). This study is limited by its cross-sectional design, modest sample size, reliance on self-reported or recorded HIV status, and the high proportion of undisclosed or untested results. Nevertheless, it provides important local evidence for transgender-focused HIV prevention and testing strategies in Punjab.

Conclusion

This study found a high burden of HIV/AIDS among transgender individuals in Punjab, with 22.0% HIV positivity in the full sample and 36.7% among those ever tested. The findings highlight important gaps in HIV testing, condom-related knowledge, healthcare access, and discrimination. Strengthening transgender-friendly HIV screening, prevention education, harm-reduction services, and confidential linkage to antiretroviral care is urgently needed.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-MMLHR-339a-25)

Consent for publication

Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

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Manuscript drafting, Study Design,
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MY & MN
Conception of Study, Development of Research Methodology Design,

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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