

High Frequency of Illegal Drug Use Influences Condom Use Among Female Transgender Sex Workers in Argentina: Impact on HIV and Syphilis Infections

María M. Avila¹ · María S. dos Ramos Farías¹ · Lucía Fazzi¹ · Marcela Romero² · Elena Reynaga³ · Rubén Marone⁴ · María A. Pando¹

© Springer Science+Business Media New York 2017

Abstract The high prevalence of HIV and syphilis found among female transgender sex workers (FTSWs) in Argentina calls for the study of factors leading to negative health consequences. Given the particular characteristics observed in this population (high marginalization, school dropout, and low adherence to healthcare services), we explored the association of several socio-demographic characteristics with syphilis and HIV infections, and the determinants of condom use. This study revealed that FTSWs from Argentina were exposed to several risk factors decreasing thus their ability to negotiate condom use and leading to increased risk for transmission of HIV and other sexually transmitted infections (STIs). Strategies to reduce HIV and syphilis in this population should consider interventions aimed at decreasing violence and substance use which appear to be the most important determinants. Results of this study will contribute to the global information among FTSWs.

Resumen La elevada prevalencia del VIH y sífilis encontrada entre las trabajadoras sexuales transgénero en Argentina requiere el estudio de los factores que conducen

a estas consecuencias negativas para la salud. Dadas las características particulares observadas en esta población (alta marginalidad, abandono escolar y baja adherencia a los servicios de salud), se exploró la asociación de varias características sociodemográficas con la presencia de sífilis e infección por VIH, así como los determinantes de uso de preservativo. Este estudio reveló que las trabajadoras sexuales transgénero de Argentina estaban expuestas a varios factores de riesgo disminuyendo así su capacidad de negociar el uso de preservativo y que las expone a un mayor riesgo de transmisión del VIH y otras ITS. Las estrategias para reducir el VIH y la sífilis en esta población deberían considerar intervenciones dirigidas a disminuir la violencia y el consumo de sustancias que parecen ser los determinantes más importantes. Los resultados de este estudio contribuyen a una mejor comprensión de la situación de salud de trabajadoras sexuales transgénero de Argentina.

Keywords HIV · Female transgender sex workers · Argentina · Syphilis · Drug use · Condom use

✉ María A. Pando
mpando@fmed.uba.ar

¹ CONICET-Universidad de Buenos Aires, Instituto de Investigaciones Biomédicas en Retrovirus y Sida (INBIRS), Paraguay 2155, Piso 11, C1121ABG Buenos Aires, Argentina

² Asociación de Travestis, Transexuales y Transgénero de Argentina (ATTTA), Buenos Aires, Argentina

³ Red de Mujeres Trabajadoras Sexuales de Latinoamérica y El Caribe (RedTraSex), Buenos Aires, Argentina

⁴ Nexo Asociación Civil, Buenos Aires, Argentina

Introduction

Female transgenders (FTs) (i.e., individuals assigned male at birth but identified themselves as female) are exposed to stigma, discrimination and familial/social exclusion since early childhood. Consequently, high levels of school dropout and household exclusion have been observed, all of which contribute to engaging in sex work as one of the very few alternatives to earn a living and to be able to pay for feminization procedures [1–4]. Moreover, high rates of alcohol and illegal drug use were reported in FTs compared to the general population [5]. Even when injecting illegal

drugs has not always been described as a common practice, substance use during sex work puts FTs at greater risk for sexually transmitted infections (STIs) as some substances impair their capacity to negotiate condom use [6]. Moreover, a high proportion of FTs reported having injected hormones themselves or with the help of peers in non-healthcare facilities, thus being exposed to injection-transmitted infections as well as other complications such as allergies [7]. Additionally, FTs face barriers to healthcare access making them even more vulnerable to several health problems [8–10]. Studies have estimated that the total mortality rate among FTs is 50% higher than the general population, mainly due to AIDS, drug abuse, suicide and cross-sex hormone treatment, among others [11].

Due to the adverse socio-demographic and environmental factors described previously, FTs have been regarded as one of the most vulnerable groups to HIV infection. In fact, previous studies demonstrated that FTs experience disproportionate HIV prevalence rates compared to other vulnerable groups with a global prevalence of 19.1% [4].

Syphilis, despite being a treatable disease, is also an important health concern among FTs due to its impact on health if left untreated. Studies conducted in Latin America and the Caribbean revealed that FTs is the population with the highest prevalence rates of active syphilis in the region among several study groups whose prevalence ranges from 6.5% in El Salvador, 9.0% in the Dominican Republic, 10.2% in Nicaragua, 42.3% in Argentina, and 43.3% in Brazil [12]. These studies clearly showed there is a need for improved monitoring, surveillance, and evaluation of syphilis among FTs. In Argentina, previous studies estimated an HIV prevalence of 28–34% among female transgender sex workers (FTSWs) [13, 14]. The last cross-sectional study also demonstrated that other STIs have become a serious problem in this group, with high prevalence of hepatitis B (HBV) (40%), *Treponema pallidum* (50%) and Human papillomavirus (HPV) (97%) [14].

The high prevalence of HIV and other STIs found among FTSWs in Argentina calls for the study of the factors driving these negative health consequences. This study was aimed to better understand the (a) socio-demographic characteristics and sex work conditions; (b) the association of these characteristics with syphilis and HIV infections; and (c) the determinants of condom use in FTSWs from Argentina.

Methods

Study Design and Study Population Characteristics

A cross-sectional study on HIV prevalence was conducted in five Argentine cities (Buenos Aires, La Plata, Córdoba,

Rosario and Santiago del Estero) from October 2006 to December 2009 [14]. During the three-year period, specific recruitment campaigns were performed in each city. During the campaigns, the major non-governmental organization (NGO) for transgender women in the country (ATTTA), together with Nexo (an NGO focused mainly on men who have sex with men), and AMMAR (an NGO working mainly with female sex workers) were responsible for recruiting participants. For the purpose of this study, FTSWs were defined as male-to-female transgenders who disclosed having received money or goods in exchange for sexual services, either regularly or occasionally [15]. In each city, FTSWs, identified by peers, were invited to participate in the study, and offered testing and counselling on HIV and other STIs. Volunteers were considered eligible for the study when they were older than 18 years of age and self-identified as FTSWs. The purpose of the study was explained to all participants during the first encounter and those who chose to participate were invited to read and sign an informed consent. Attendees who provided a written informed consent were offered to be provided with HIV and other STIs testing, pre- and post-test counselling, and then interviewed by a trained peer or social worker using a standardized questionnaire. Sample size was calculated considering an expected HIV prevalence ranging from 20 to 30%, and 5% type 1 error. According to this HIV frequency, the sample size was estimated to recruit between 243 and 318 participants.

This research was reviewed by the Nexo AC Institutional Biomedical Review Board (IRB 5349) and conducted in compliance with all federal regulations governing the protection of human subjects. International and national ethical guidelines for biomedical research involving human subjects were followed.

Blood Sample Collection and STI Diagnosis

Upon recruitment, anticoagulated and non-anticoagulated blood samples were collected in sterile conditions using standard safety precautions and protocols. HIV screening was performed by ELISA (Enzygnost Anti-HIV ½ Plus ELISA, Dade Behring, Germany) and particle agglutination (Bio-Rad, Fujirebio Diagnostics, Inc., Japan). Reactive samples were subsequently confirmed by Western blot (New LAV Blot I, Bio-Rad Laboratories, Inc., WA, USA). Syphilis infection (past or present) was determined by nontreponemal (Venereal Disease Research Laboratory (VDRL), Wiener Laboratorios, SAIC, Rosario, Argentina) and treponemal (*Treponema pallidum* hemagglutination assay (TPHA), Biokit SA, Barcelona, Spain) assays. An indirect immunofluorescence test (FTA-abs, Immunofluor Biocientífica SA, Argentina) was used in the case of discordant results. HBV infection markers such as surface

antigen (HBsAg) and anti-core antibody (anti-HBc) were determined using ELISA (HBsAg (V2) Abbott AxSYM System, Core AxSYM System Abbott, Wiesbaden, Germany). For epidemiological purposes, a sample was considered HBV-positive if at least one of the markers was found. In order to determine HCV infection, HCV antibodies were tested by ELISA (HCV version V3.0, Abbott AxSYM System, Wiesbaden, Germany).

For incidence estimation, HIV-positive plasma samples were tested using a modified or “detuned” version of an HIV-1 enzyme immunoassay (Vironostika HIV-1 Micro-elisa System; bioMerieux Inc., North Carolina) to classify them either as potential recently acquired infections (time of infection less than 4–6 months prior to sample collection) or longstanding infections. Thus, the use of STARHS was performed as described previously [16].

Measures

The questionnaire consisted of several queries involving socio-demographic data and characteristics of the sex work activity. Socio-demographic and health-related data included: age, nationality, housing situation, educational attainment, income generating activities, health insurance, history of STIs and treatment, history of sexual abuse, steady partners, substance use, history of HIV testing, perception of HIV acquisition, and condom use. In relation to condom use with partners, the questionnaire included information about their use over the past six months and past sexual intercourse. Answers ranged between regularly (always use condom) and irregularly (sometimes or never use condom). Respondents who reported irregular use of condom, most common reasons for not using it were recorded. Questions about substance consumption included the use of alcohol and illegal drugs, and their influence on sex work activity and condom use.

In relation to the characteristics of sex work activities, participants were asked to provide information about: time spent on sex work activities (in years), condom use with clients (over the past six months and past sexual intercourse), reasons for starting sex work activities, and history of violence and incarceration due to sex work activities.

Statistical Analysis

Baseline characteristics were described using medians and interquartile ranges (IQRs) for continuous variables, and counts and percentages for categorical data. Ninety-five percent confidence intervals (95% CI) for HIV and syphilis seroprevalences were estimated using exact binomial formula. Comparisons between proportions were analyzed by parametric and non-parametric methods. Bivariate analyses were performed to calculate Chi square test or Fisher’s

exact test according to sample size. Statistically significant variables ($p < 0.05$) found in bivariate analyses were included in a multivariate logistic regression model. The magnitude of associations of potential risk factors in the analyses was expressed as odds ratio (OR). Multiple logistic regression analysis was applied to determine adjusted odds ratio (AOR). All the risk factors found to be statistically significant in the analyses were entered into a forward, stepwise selection multivariate logistic regression to identify independent risk factors associated with HIV and syphilis. Only AOR for variables that remained significantly associated were reported. All the p values reported were two-sided; p values < 0.05 were considered statistically significant. Statistical analyses were carried out using IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp. Released 2013. Armonk, NY: IBM Corp.).

Results

FTSWs Demographic Characteristics

A total of 273 self-identified FTSWs were included in the study: 166 in Buenos Aires, 50 in Cordoba, 22 in La Plata, five in Rosario and 30 in Santiago del Estero. Due to the small number of participants in some cities, results were not stratified by city. Table 1 shows the demographic characteristics of study participants. Foreign FTSWs were mostly from Peru (13.6%) and Paraguay (7.3%). Syphilis was the most frequently reported STI (66.9%), followed by condyloma (16.9%), hepatitis B virus (HBV) (16.9%), human papilloma virus (HPV) (12.8%), gonorrhoea (6.8%), and human herpes virus (HHV) (4.4%). Regarding treatment against these STIs, 89.2% of the participants reported having been treated. Most FTSWs (92.8%) had had their first sexual intercourse with a man and in most cases (94.9%) those with a steady partner were males. The most frequent reasons reported by the FTSWs for not using condoms were “I trusted my partner” (58.2%), “I considered it was not safe” (44.8%), “I was not willing to use it” (35.8%), “I thought it decreased sensitivity” (35.8%), “Condom use was rejected by my partner” (31.3%), “I believed my partner was not HIV positive” (29.7%), “I was too aroused” (25.8%), “I was under the influence of drugs” (11.9%), and “I was drunk” (7.8%). Reasons are not mutually exclusive.

Most FTSWs (83.5%) acknowledged alcohol use at weekends only. Regarding illegal drugs, substances most frequently used were cocaine (25.3%) and marijuana (18.5%) followed by over-the-counter drugs (5.3%). Most participants consumed drugs through mouth (48.9%) or nose (77.3%) but two participants (2.3%) declared being injection drug users, both of whom shared paraphernalia.

Table 1 Demographic characteristics and their association with syphilis and HIV among 273 female transgender sex workers from Argentina (2006–2009)

	Frequency % (n/N)	Syphilis prevalence % (n/N)	p value (OR, 95% CI)	HIV prevalence % (n/N)	p value (OR, 95% CI)
Age^c					
<29 years old	48.7 (133/273)	38.2 (47/123)	<0.001^a (2.58, 1.56–4.27)	29.3 (39/133)	0.126 ^a (1.51, 0.91–2.51)
≥29 years old	51.3 (140/273)	61.5 (83/135)		38.6 (54/140)	
Nationality					
Argentinean	75.8 (207/273)	50.0 (96/192)	0.887 ^a (0.94, 0.54–1.65)	35.7 (74/207)	0.371 ^a (1.38, 0.75–2.52)
Foreigners	24.2 (66/273)	51.5 (34/66)		28.8 (19/66)	
Housing situation					
Home/apartment	70.4 (190/270)	52.2 (94/180)	0.492 ^a (1.25, 0.73–2.14)	31.6 (60/190)	0.206 ^a (0.69, 0.40–1.19)
Precarious places	29.6 (80/270)	46.7 (35/75)		40 (32/80)	
Formal educational attainment					
Completed high school	54.9 (150/273)	43.7 (62/142)	0.018^a (0.55, 0.33–0.90)	36.7 (55/150)	0.369 ^a (1.29, 0.78–2.15)
Not completed high school	45.1 (123/273)	58.6 (68/116)		30.9 (38/123)	
Have other job					
Yes	17.6 (47/267)	51.2 (22/43)	0.868 ^a (1.09, 0.56–2.10)	31.9 (15/47)	0.738 ^a (0.87, 0.44–1.71)
No	82.4 (220/267)	49.0 (103/210)		35.0 (77/220)	
Health insurance					
Yes	9.0 (24/268)	45.0 (9/20)	0.647 ^a (0.78, 0.31–1.96)	29.2 (7/24)	0.658 ^a (0.77, 0.31–1.93)
No	91.0 (244/268)	51.1 (119/233)		34.8 (85/244)	
Reported previous STI					
Yes	45.2 (117/259)	70.3 (78/111)	<0.001^a (4.23, 2.47–7.26)	47.4 (55/116)	<0.001^a (2.63, 1.55–4.46)
No	54.8 (142/259)	35.8 (48/134)		25.5 (35/137)	
History of sexual abuse					
At first sexual intercourse					
Yes	5.9 (13/221)	50.0 (6/12)	1.000 ^a (1.02, 0.32–3.28)	38.5 (5/13)	0.769 ^a (1.21, 0.38–3.82)
No	94.1 (208/221)	49.5 (96/194)		34.1 (71/208)	
During life					
Yes	25.7 (58/226)	62.3 (33/53)	0.040^{a,c} (0.51, 0.27–0.96)	32.8 (19/58)	0.873 ^a (1.08, 0.57–2.04)
No	74.3 (168/226)	45.6 (72/158)		34.5 (58/168)	
Age at first sexual intercourse^c					
<13 years old	40.7 (110/270)	60.0 (63/105)	0.011^a (0.51, 0.31–0.85)	41.8 (46/110)	0.026 ^a (0.54, 0.33–0.91)
≥13 years old	59.3 (160/270)	43.3 (65/150)		28.1 (45/160)	
Have a steady partner					
Yes	28.8 (77/267)	50.7 (34/67)	0.887 ^a (0.95, 0.54–1.66)	35.1 (27/77) ^a	0.887 ^a (0.94, 0.54–1.64)
No	71.2 (190/267)	49.5 (92/186)		33.7 (64/190)	
Condom use with steady partner (last 6 months)					
Regular	34.6 (27/78)	54.2 (13/24)	0.800 ^a (0.77, 0.28–2.09)	66.7 (18/27)	0.000^{a,c} (0.12, 0.42–0.35)
Irregular	65.4 (51/78)	47.7 (21/44)		19.6 (10/51)	
Alcohol consumption					
Yes	62.7 (170/271)	52.2 (84/161)	0.438 ^a (1.26, 0.76–2.10)	36.5 (62/170)	0.357 ^a (1.30, 0.77–2.19)
No	37.3 (101/271)	46.3 (44/95)		30.7 (31/101)	
Illegal drug consumption					
Yes	33.2 (88/265)	55.6 (45/81)	0.281 ^a (1.36, 0.80–2.31)	39.8 (35/88)	0.273 ^a (1.39, 0.82–2.36)
No	66.8 (177/265)	47.9 (81/169)		32.2 (57/177)	

Table 1 continued

	Frequency % (n/N)	Syphilis prevalence % (n/N)	p value (OR, 95% CI)	HIV prevalence % (n/N)	p value (OR, 95% CI)
Previous HIV testing					
Yes	83.1 (222/267)	55.0 (115/209)	<0.001^{a,c} (4.04, 1.89–8.62)	36.9 (82/222)	0.061 ^a (2.05, 0.96–4.36)
No	16.9 (45/267)	23.3 (10/43)		22.2 (10/45)	
Pick up result					
Yes	88.6 (195/220)	54.3 (100/184)	0.671 ^a (0.79, 0.34–1.86)	35.4 (69/195)	0.208 ^a (0.59, 0.26–1.32)
No	11.4 (25/220)	60.0 (15/25)		48.1 (13/27)	
Result of previous test					
Positive	17.9 (35/195)	62.5 (20/32)	0.335 ^a (1.50, 0.68–3.28)	97.1 (34/35) ^d	<0.001^b (121.4, 16.05–918.66)
Negative	82.1 (160/195)	52.6 (80/152)		21.9 (35/160)	
Possibility of HIV acquisition					
No possibility	6.8 (16/236)	68.8 (11/16)	0.119 ^b (2.52, 0.84–7.50)	18.8 (3/16)	0.767 ^b (0.67, 0.18–2.46)
Some/high possibility	93.2 (220/236)	46.6 (97/208)		25.4 (56/220)	

^a p value was calculated using Chi square tests. Results in bold were considered statistically significant when $p < 0.05$

^b p value was calculated using Fisher's exact test. Results in bold were considered statistically significant when $p < 0.05$

^c In the multivariate analyses, the report of a previous sexual abuse (AOR 2.21, 95% CI 1.05–4.67, $p = 0.036$) and having done a previous HIV test (AOR 3.88, 95% CI 1.59–9.51, $p = 0.003$) remains independently associated with higher syphilis prevalence, and regular use of condom with partner remains significantly associated with higher HIV prevalence (AOR 10.40, 95% CI 2.69–40.18, $p = 0.036$)

^d One participant reported a previous HIV positive result; however, the HIV test performed in the present study was negative

^e Variable strata were made considering mean value

Among the FTSWs tested previously for HIV infection, the low level of picking up the results was related with previous history of physical violence; a total of 92.4% of those who did not report being beaten picked up the HIV test results. However, this frequency dropped by 85.3% among those who reported having been beaten “sometimes” and by 60.0% among those who had been beaten “frequently” ($p = 0.020$). Out of the 195 participants who picked up their HIV test result, 17.9% acknowledged being HIV positive.

Sex Work Characteristics

FTSWs spent a median of six years (IQR 3–14.7) in the sex work activity, with the most frequent reason for engaging in sex work being the economic situation (86.5%). In relation to the place of contact with clients, participants stated they mostly occurred in the street (75.2%) and a lower frequency attended client's residence (15.9%) after contacting them by phone. The median number of clients per week was 20 (IQR 10–36) and most FTSWs (90.2%) preferred male clients.

With regard to condom use with a client, the most frequent reasons for not using condoms with commercial partners were: “The client offered extra payment for unsafe sex” (80.2%), “I didn't know how to ask for it” (57.9%), “I considered it was not safe” (54.2%), “Condom was

rejected by the client” (48.6%), “I considered the client was HIV negative” (48.6%), “I was drunk” (20%) and “I was under the influence of drugs” (17.8%). More information about characteristics of sex work activity is shown in Table 2.

Prevalence of Sexually Transmitted Infections (STIs)

During the study, HIV infection was detected in 34.1% (93/273, 95% CI 28.7–39.9) of FTSWs, while the HIV incidence rate was 10.7 per 100 person-years (95% CI 3.8–17.7). Regarding hepatitis B infection, 40.2% (106/264, 95% CI 34.4–46.2) of the participants had anti-HBc, and five of them had detectable HBsAg also. Hepatitis C infection (HCV) was detected in 4.5% (12/264, 95% CI 2.5–7.9) of FTSWs. *T. pallidum* infection was evaluated by VDRL revealing a prevalence of 50.4% (130/258, 95% CI 44.3–56.4) [14, 16].

Predictors of HIV/Syphilis Infection

In order to explore potential predictors of HIV/syphilis infection, a bivariate analysis was performed. Even when bivariate analyses revealed several significant associations (Tables 1, 2) when the multivariate analysis was performed, only the report of a previous sexual abuse (AOR

Table 2 Characteristics of sex work activity and their association with syphilis and HIV among 273 female transgender sex workers from Argentina (2006–2009)

	Frequency % (n/N)	Syphilis prevalence % (n/N)	p value ^a (OR, 95% CI)	HIV prevalence % (n/N)	p value ^a (OR, 95% CI)
Condom use with client					
Last 6 months					
Regular	64.6 (173/268)	46.0 (75/163)	0.150	34.7 (60/173)	0.894
Irregular	35.4 (95/268)	56.0 (51/91)	(1.50, 0.89–2.51)	33.7 (32/95)	(0.96, 0.56–1.62)
Last intercourse					
Yes	91.5 (247/270)	50.2 (117/233)	1.000	33.6 (83/247)	0.648
No	8.5 (23/270)	50.0 (11/22)	(0.99, 0.41–2.38)	39.1 (9/23)	(1.27, 0.53–3.06)
Were under arrest ^b					
Yes	67.9 (182/268)	56.9 (99/174)	0.002	36.8 (67/182)	0.270
No	32.1 (86/268)	35.4 (28/79)	(2.40, 1.39–4.17)	29.1 (25/86)	(1.42, 0.82–2.47)
History of physical violence ^b					
Yes	45.3 (120/265)	56.4 (62/110)	0.128	41.7 (50/120)	0.02
No	54.7 (145/265)	46.4 (65/140)	(1.49, 0.90–2.46)	28.3 (41/145)	(1.81, 1.08–3.02)
Alcohol facilitate sex work					
Yes	32.3 (53/164)	61.2 (30/49)	0.171	49.1 (26/53)	0.058
No	67.7 (111/164)	49.1 (52/106)	(1.64, 0.82–3.27)	32.4 (36/111)	(2.01, 1.03–3.92)
Alcohol influenced condom use					
Yes	20.0 (33/165)	64.5 (20/31)	0.162	48.5 (16/33)	0.158
No	80.0 (132/165)	49.6 (62/125)	(1.85, 0.82–4.17)	34.1 (45/132)	(1.82, 0.84–3.94)
Illegal drugs influenced sex work					
Yes	52.3 (46/88)	61.5 (24/39)	0.183	41.3 (19/46)	0.664
No	47.7 (42/88)	45.2 (19/42)	(1.94, 0.80–4.70)	35.7 (15/42)	(1.27, 0.54–3.00)
Illegal drugs influenced condom use					
Yes	33.3 (27/81)	66.7 (16/24)	0.085	44.4 (12/27)	0.472
No	66.7 (54/81)	44.0 (22/50)	(2.54, 0.92–7.03)	35.2 (19/54)	(1.47, 0.57–3.78)
Start sex work because					
Family rejection					
Yes	16.2 (43/266)	64.3 (27/42)	0.044	41.9 (18/43)	0.224
No	83.8 (223/266)	46.9 (98/209)	(2.04, 1.03–4.05)	32.3 (72/223)	(1.51, 0.77–2.94)
Drug use					
Yes	9.0 (24/266)	42.9 (9/21)	0.649	41.7 (10/24)	0.499
No	91.0 (242/266)	50.4 (116/230)	(0.74, 0.30–1.82)	33.5 (81/242)	(1.42, 0.60–3.34)
Unemployment					
Yes	75.9 (202/266)	49.0 (95/194)	0.545	37.1 (75/202)	0.096
No	24.1 (64/266)	54.4 (31/57)	(0.80, 0.44–1.45)	25.0 (16/64)	(1.77, 0.94–3.34)
Years in sex work activity ^c					
<6 years	46.6 (123/264)	34.5 (40/116)	<0.001	24.4 (30/123)	0.003
≥6 years	53.4 (141/264)	65.4 (87/133)	(3.59, 2.13–6.07)	42.6 (60/141)	(2.30, 1.35–3.90)

^a p value was calculated using Chi square tests. Results in bold were considered statistically significant when $p < 0.05$

^b “History of physical violence” or “were under arrest” because of sex work activity

^c Variable strata were made considering mean value

2.21, 95% CI 1.05–4.67, $p = 0.036$) and having done a previous HIV test (AOR 3.88, 95% CI 1.59–9.51, $p = 0.003$) remain independently associated with a higher syphilis prevalence. In relation to HIV, only the

regular use of condom with partners remains significantly associated with higher HIV prevalence (AOR 10.40, 95% CI 2.69–40.18, $p = 0.036$).

Condom Use Predictors

In order to understand the variables that have an influence on condom use with commercial partners, a particular analysis was performed (Table 3). Even when the bivariate analysis revealed that FTSWs who reported physical violence, sexual abuse during life and illegal drug use, among other variables, were significantly less prone to use condoms with clients, in the multivariate analyses, only illegal drug use remains independently associated with irregular use of condom (AOR 2.7, 95% CI 1.2–5.8, $p = 0.013$).

Discussion

International reports have demonstrated that female transgenders are highly discriminated from an early age; exposing them to adverse environmental conditions, living in precarious situations and predisposing them to substance use, sex work activity and in consequence, being vulnerable to several health problems, like STIs [1, 4, 19].

However, no previous scientific studies have been conducted in Argentina aimed at describing the socio-demographic characteristics or behaviors that contributed to high levels of STIs prevalence.

Over the past few years, Argentina has achieved innovative advances in order to guarantee the rights of Lesbian, Gay, Bisexual & Transgender individuals, including two national laws, one of which allows same-sex marriage [17] and the other one that consents the change of the individual's identity according to gender identification [18]. Previous studies suggested that FTSWs from Argentina perceive the opportunity to change the individual's identity according to their gender identity as a resource to decrease the social stigma they face, particularly within the health-care system [21]. Our study attempts to understand the situation of the FTSWs prior to the new regulations in order to obtain enough information in the future to evaluate the impact of the new laws.

Socio-demographic data from the current study reveal that a higher proportion of FTSWs ($\approx 30\%$) lives in precarious places compared with data obtained from the

Table 3 Predictors of regular condom use with commercial partners among 273 female transgender sex workers from Argentina (2006–2009)

	Regular condom use with commercial partner	p value ^a (OR, 95% CI)
History of physical violence		
Yes	56.7 (68/120)	0.014
No	71.3 (102/144)	(1.9, 1.1–3.2)
History of sexual abuse during life		
Yes	46.6 (27/58)	0.004
No	68.9 (113/164)	(2.5, 1.4–4.7)
Illegal drug use		
Yes	50.6 (44/87)	0.003
No	70.5 (124/176)	(2.4, 1.4–4.1)^b
Alcohol use influenced condom use		
Yes	37.5 (12/32)	0.001
No	70.2 (92/131)	(3.9, 1.7–8.7)
Drug use influenced condom use		
Yes	25.9 (7/27)	0.001
No	66.0 (35/53)	(5.4, 1.9–15.2)
Started sex work because		
Family rejection		
Yes	50.0 (21/42)	0.035
No	67.4 (149/221)	(2.1, 1.1–4.0)
Drugs consume		
Yes	39.1 (9/23)	0.010
No	67.5 (162/240)	(3.2, 1.3–7.8)

^a OR and p value were calculated using Chi square tests. Results in bold were considered statistically significant when $p < 0.05$. Only statistically significant results were reported

^b In the multivariate analyses, illegal drug use remains independently associated with use of condom (AOR 2.7, 95% CI 1.2–5.8, $p = 0.013$)

general population ($\approx 4\%$). FTSWs also have lower frequency of health-care insurance (9% in transgenders vs. 63.9% in the general population), mostly because they do not have formal jobs [20]. Even when in Argentina, individuals not having health-care insurance can be assisted in public hospitals for free, these places are crowded, there are delayed appointments, reduced opening hours and are not seen as transgender-friendly services. In fact, a previous study revealed that female transgenders without health-care insurance were more likely to report health-care avoidance [21]. The scarce links to care among transgenders contribute to explaining the complex health situation with high prevalence of STIs as well as illegal substance use and comorbidities.

Among our study population there is a high frequency of foreigners; approximately 25% of them were born in Peru, Paraguay or other Latin American countries. According to a key person (ATTTA), many female transgenders come to Argentina in search of a job position and legal documentation and then they travel to Europe. This situation is commonly associated with the fact that Argentina (in particular Buenos Aires) has a favourable environment with a lower rate of discrimination compared with other countries in the region. In line with this, one socio-demographic study performed among female transgenders in Spain found that 23.9% of them were from South America [22]. Even when in international studies migrants are considered vulnerable groups for HIV infection and disease progression [23, 24], our study did not find a higher prevalence of STIs among foreigners.

Socio-demographic variables associated with a higher frequency of HIV and syphilis in the bivariate analysis, like older age, lower age at first sexual intercourse and more years in the sex work activity, can be explained due to longer times of exposure, as reported previously [25].

Violence can be considered a serious problem among FTSWs, with approximately 45% of the study group reporting history of physical violence, and 25% reporting sexual abuse, and starting early in life which continues over the time. Participants' reports reveal that transgenders appear to be victimized by strangers as well as by people they know, including relatives and partners. This high level frequency of violence is in agreement with international studies [26, 27]. Violence can be associated in itself with higher HIV and other STI transmissions through unprotected intercourse during forced sex, and it can also influence future risk behaviors. For example, even when no significant association was found in the multivariate analysis, our data suggest that FTSWs reporting history of sexual and other physical violence were less prone to use condoms. This situation can be explained by the fact that violence experiences can generate negative mental health consequences predisposing them to avoiding health-care services.

Additionally, due to the high frequency of drug use and its influence on condom use, there is another problem that needs to be addressed among FTSWs. Approximately 25% of the participants reported cocaine use over the last six months, while previous studies revealed that 2.7% of the population consumed cocaine some time in their lives [28]. Considering that injecting drug use is not a common practice among this group (neither in other groups in Argentina) [29], HIV infection is most probably transmitted through unprotected sexual intercourse. In fact, half of the study group acknowledged that drug use facilitated sex work activity and more than 65% declared that it had an influence on condom use. These results suggest that illegal drug use is a really serious problem among this population leading to HIV exposure. Even when no significant association was found between drug use and HIV/syphilis frequency, illegal drug use remains associated with irregular condom use when multivariate analyses were performed.

Data analysis on condom use reveals some discrepancies according to partners; while 65% of FTSWs reported using condoms with clients always, this frequency dropped by 35% when steady partners were considered. This behaviour has been reported previously by our group among female sex workers (FSWs) in Argentina [30, 31]. In both studies, data suggest that sex workers can easily negotiate condom use with unknown people but not with emotionally involved individuals. In fact, "I trust my partner" was the most frequent answer when the reasons for unprotected sex were asked. Even when the frequency of condom use was higher regarding commercial partners, approximately 35% of FTSWs reported not using condoms regularly, mostly because "the client offered extra payment". These results highlight how the economic situation of the individuals can have an impact on risk behaviour. The low frequency of condom use and the high level of exposure FTSWs have (with a median of 20 clients per week), could be a reason for the high frequency of STIs reported previously [14]. However, no causal association can be established with this study. As reported elsewhere, our results show a higher frequency of HIV among those who use condoms regularly. This association can be explained because participants who were aware of their HIV positive status may be more likely to use condoms to avoid transmission to their partner.

Considering that the lack of condom use appears to be the main reason for acquiring HIV infection, we analyzed the variables that influence their use with commercial partners. Our bivariate analysis shows that sexual abuse and physical violence, as well as illegal substance use, were associated with a decrease in the rate of condom use. Previous studies are in line with these observations. Nutbrock and colleagues found that gender abuse among

transgenders predicts depressive symptoms which then lead to unprotected intercourse [2]. However, illegal drug use, remained associated in multivariate analysis, seems to be the most important determinant of irregular condom use. These results clearly reveal that future interventions to reduce the impact of HIV/Syphilis should be focused on integrative programs taking into account gender abuse, stigmatisation and illegal substance use among the determining factors of condom use.

Some potential limitations should be considered in our study. Regarding recruitment methodology, as non-randomized sampling was used; this study may have selection biases. Even more, the study did not collect data about the proportion of the target population that was reached by peers and did not agree to participate in the study. Another factor to be considered is that the recruitment period was long (three years). Though no period effect that could influence variations in recruitment or characteristics of the recruited FTSWs were recorded, we are not sure whether some undetectable factors could bias the sampling. In addition to this, given the use of self-reports to measure most of the data, this study may be affected by a recall bias. In relation to condom use, the possibility of over-reporting condom use because of perceived stigmatization must be considered. Finally, it should also be considered the lack of information on sex-reassignment frequency in our group. Representatives of transgender organizations described that transgender women, even after the new regulations, still have limited access to sex-reassignment surgery. Previous studies conducted in countries where surgery is more accessible found that around 11% in Thailand [32], 20% in the United States [33] and 25% in Canada [34] had undergone any kind of surgery. Future studies need to be done in Argentina since new regulations allow this surgery for free. It is expected that the amount of sex-reassignment surgeries increase in the future, it will be necessary to measure this frequency in order to include this variable on the HIV acquisition risk factor analysis [1]. Until now there is no information about HIV transmission through the neovagina or the impact of prevention strategies in this scenario. Our study also lacks information about presence or absence of hormone replacement therapies, even though this practice is very common. Future research studies should also consider this variable as it can be considered an HIV transmission route without medical assistance (i.e. potential use of shared needles for injection). Even with these limitations, this study provided very important information regarding FTSWs that can address future in-depth studies that the current research could not answer.

In conclusion, our study revealed that FTSWs from Argentina were exposed to several risk factors that decreased their ability to negotiate condom use and increased their risk for HIV and other STIs. Strategies to

reduce HIV and syphilis in this population should consider interventions to decrease substance use which appears to be the most important determinant. Worldwide, transgender women experience exceptionally high risks for HIV and other STIs acquisition as a result of several adverse conditions, like barriers to legal recognition, formal employment, housing, and health-care. Violence, stigma and discrimination have also disproportionately affected transgender individuals, resulting in higher psychological disorders and substance use. It is expected that new regulations will contribute to reducing stigma among transgenders and, consequently help them to improve social inclusion allowing them to reach formal jobs, housing and health-care. The results of the current study will contribute to the global information among FTSW and will be useful to measure the impact of these new regulations.

Acknowledgements We would like to thank all participants who made this study possible, as well as Mr. Sergio Mazzini for editing the manuscript.

Funding This study was supported by the National Research Council (CONICET) of Argentina (PIPs 112-200801-01773 and 2012-1048) and the Global Fund Project (Subproject No. 112).

Compliance with Ethical Standards

Conflict of interest Authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in the study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

References

1. Poteat T, Wirtz AL, Radix A, et al. HIV risk and preventive interventions in transgender women sex workers. *Lancet*. 2015;385(9964):274–86.
2. Nuttbrock L, Bockting W, Rosenblum A, et al. Gender abuse, depressive symptoms, and HIV and other sexually transmitted infections among male-to-female transgender persons: a three-year prospective study. *Am J Public Health*. 2013;103(2):300–7.
3. De Santis JP. HIV infection risk factors among male-to-female transgender persons: a review of the literature. *J Assoc Nurses AIDS Care*. 2009;20(5):362–72.
4. Baral SD, Poteat T, Strömdahl S, Wirtz AL, Guadamuz TE, Beyrer C. Worldwide burden of HIV in transgender women: a systematic review and meta-analysis. *Lancet Infect Dis*. 2013;13(3):214–22.
5. Reisner SL, Gamarel KE, Nemoto T, Operario D. Dyadic effects of gender minority stressors in substance use behaviors among transgender women and their non-transgender male partners. *Psychol Sex Orientat Gend Divers*. 2014;1(1):63–71.

6. Hoffman BR. The interaction of drug use, sex work, and HIV among transgender women. *Subst Use Misuse*. 2014;49(8):1049–53.
7. Mepham N, Bouman WP, Arcelus J, Hayter M, Wylie KR. People with gender dysphoria who self-prescribe cross-sex hormones: prevalence, sources, and side effects knowledge. *J Sex Med*. 2014;11(12):2995–3001.
8. Bauer GR, Scheim AI, Deutsch MB, Massarella C. Reported emergency department avoidance, use, and experiences of transgender persons in Ontario, Canada: results from a respondent-driven sampling survey. *Ann Emerg Med*. 2014;63(6):713–20.
9. IOM (Institute of Medicine). *The health of lesbian, gay, bisexual, and transgender people: building a foundation for better understanding*. Washington, DC: The National Academies Press; 2011.
10. Sevelius JM, Saberi P, Johnson MO. Correlates of antiretroviral adherence and viral load among transgender women living with HIV. *AIDS Care*. 2014;26(8):976–82.
11. Asscheman H, Giltay EJ, Megens JA, de Ronde WP, van Trotsenburg MA, Gooren LJ. A long-term follow-up study of mortality in transsexuals receiving treatment with cross-sex hormones. *Eur J Endocrinol*. 2011;164(4):635–42.
12. Zoni AC1, González MA, Sjögren HW. Syphilis in the most at-risk populations in Latin America and the Caribbean: a systematic review. *Int J Infect Dis*. 2013;17(2):e84–92.
13. Toibaro JJ, Ebensrtejin JE, Parlante A, et al. Sexually transmitted infections among transgender individuals and other sexual identities. *Medicina (B Aires)*. 2009;69(3):327–30.
14. Dos Ramos Farías MS, Garcia MN, Reynaga E, et al. First report on sexually transmitted infections among trans (male to female transvestites, transsexuals, or transgender) and male sex workers in Argentina: high HIV, HPV, HBV, and syphilis prevalence. *Int J Infect Dis*. 2011;15(9):e635–40.
15. UNAIDS. UNAIDS guidance note on HIV and sex work. 2012. http://www.unaids.org/sites/default/files/sub_landing/files/JC2306_UNAIDS-guidance-note-HIV-sex-work_en.pdf.
16. Pando MA, Gómez-Carrillo M, Vignoles M, Rubio AE, dos Ramos Farias MS, Vila M, Rossi D, Ralón G, Marone R, Reynaga E, Sosa J, Torres O, Maestri M, Avila MM, Salomón H. Incidence of HIV type 1 infection, antiretroviral drug resistance, and molecular characterization in newly diagnosed individuals in Argentina: A Global Fund Project. *AIDS Res Hum Retroviruses*. 2011;27(1):17–23.
17. Boletín Oficial de la República Argentina. 2010. Año CXVIII. Número 31.949. Ley 26.618. Matrimonio Civil. Código Civil. Modificación. Disponible en: <http://www1.hcdn.gov.ar/BO/boletin10/2010-07/BO22-07-2010leg.pdf>.
18. Boletín Oficial de la República Argentina. 2012. Año CXX. Número 32.404. Ley 26743. Identidad de Género. Establécese el derecho a la identidad de género de las personas. Disponible en: <http://www4.hcdn.gov.ar/BO/boletin12/2012-05/BO24-05-2012leg.pdf>.
19. Logie CH, James L, Tharao W, Loutfy MR. “We don’t exist”: a qualitative study of marginalization experienced by HIV-positive lesbian, bisexual, queer and transgender women in Toronto, Canada. *J Int AIDS Soc*. 2012;15(2):17392.
20. INDEC. *Censo Nacional de Población, Hogares y Viviendas 2010*.
21. Socías ME, Marshall BD, Arístegui I, et al. Factors associated with healthcare avoidance among transgender women in Argentina. *Int J Equity Health*. 2014;13(1):81.
22. Gómez-Gil E, Trilla A, Salamero M, Godás T, Valdés M. Sociodemographic, clinical, and psychiatric characteristics of transsexuals from Spain. *Arch Sex Behav*. 2009;38(3):378–92.
23. Desgrees-du-Lou A, Pannetier J, Ravalihasy A, et al. Is hardship during migration a determinant of HIV infection? Results from the ANRS PARCOURS study of sub-Saharan African migrants in France. *AIDS*. 2016;30(4):645–56.
24. Saracino A, Lorenzini P, Lo Caputo S, et al. Increased risk of virologic failure to the first antiretroviral regimen in HIV-infected migrants compared to natives: data from the ICONA cohort. *Clin Microbiol Infect*. 2016;22(3):288.
25. Brito MO, Hodge D, Donastorg Y, Khosla S, Lerebours L, Pope Z. Risk behaviours and prevalence of sexually transmitted infections and HIV in a group of Dominican gay men, other men who have sex with men and transgender women. *BMJ Open*. 2015;5(4):e007747.
26. Peitzmeier SM, Yasin F, Stephenson R, et al. Sexual violence against men who have sex with men and transgender women in Mongolia: a mixed-methods study of scope and consequences. *PLoS ONE*. 2015;10(10):e0139320.
27. Stotzer RL. Violence against transgender people: A review of United States data. *Aggress Violent Beh*. 2009;14:170–9.
28. UNODC/CICAD. *Elementos Orientadores para las Políticas Públicas sobre Drogas en la Subregión: Primer Estudio Comparativo sobre Consumo de Drogas y Factores Asociados en Población de 15 a 64 años, 2008*. https://www.unodc.org/documents/wdr/WDR_2010/2.3_Coca-cocaine.pdf.
29. Rossi D, Pawlowicz MP, Rangugni V, et al. The HIV/AIDS epidemic and changes in injecting drug use in Buenos Aires, Argentina. *Cad. Saúde Pública*. 2006;22:741–50.
30. Pando MA, Berini C, Bibini M, et al. Prevalence of HIV and other sexually transmitted infections among female commercial sex workers in Argentina. *Am J Trop Med Hyg*. 2006;74(2):233–8.
31. Pando MA, Reynaga E, Coloccini RS, et al. Mujeres trabajadoras sexuales en Argentina. Prevalencia de VIH y *T. pallidum* en mujeres trabajadoras sexuales de Argentina. *Rev Panam de Salud Pública*. 2011;30(4):303–8.
32. Guadamuz TE, Wimonasate W, Varangrat A, et al. HIV prevalence, risk behavior, hormone use and surgical history among transgender persons in Thailand. *AIDS Behav*. 2011;15(3):650–8.
33. Grant JM, Mottet LA, Tanis J, Harrison J, Herman JL, Keisling M. *Injustice at every turn: a report of the National Transgender Discrimination Survey*. National Center for Transgender Equality and National Gay and Lesbian Task Force, Washington, 2011. http://www.thetaskforce.org/static_html/downloads/reports/reports/ntds_full.pdf.
34. Scheim AI, Bauer GR. Sex and gender diversity among transgender persons in Ontario, Canada: results from a respondent-driven sampling survey. *J Sex Res*. 2015;52(1):1–14.