Experiences of homophobia and adherence to antiretroviral treatment (ART) in men who have sex with men (MSM)

Experiencias de homofobia y adherencia al tratamiento antirretroviral (TAR) en hombres que tienen sexo con hombres (HSH)

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Abstract

The aim of the study was to know the relationship of homophobic experiences with adherence to antiretroviral treatment (ART) in men who have sex with men (MSM) in Mexico City (CDMX). A cross-sectional study was conducted with a convenience sampling of MSM who lived with HIV, treated at two public health institutions at Mexico City (n=340). A questionnaire was applied to record information related to the adherence to ART of the participants and their experiences of violence and discrimination associated with homophobia and internalized homophobia. Between 14% and 33% of MSM reported experiences of discrimination and between 41% and 60% experienced violence. When participants had jointly experienced both types of stressors, the risk of low adherence to ART in the previous month was higher (RP=6.49) than when they had experienced only one of them (RP=4.36 for violence and RP=5.67 for discrimination). Health professionals must be sensitive to how the sociocultural environment can affect self-care among MSM including ART adherence.

Keywords: Treatment Adherence and Compliance; HIV; Anti-HIV Agents; Homophobia; Sexual and Gender Minorities.

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Resumen

El objetivo del estudio fue conocer la relación de las experiencias de homofobia con la adherencia al tratamiento anti-retroviral (TAR) en hombres que tienen sexo con hombres (HSH). Para ello, se realizó una encuesta transversal con una muestra por conveniencia de HSH que vivían con VIH (n=340) atendidos en dos instituciones públicas de salud de la Ciudad de México. La información sobre la adherencia al TAR en el mes previo de los participantes y sus experiencias de violencia, discriminación y homofobia internalizada se recopiló mediante un cuestionario. Entre 14% y 33% de los HSH reportaron alguna experiencia de discriminación y entre 41% y 60% experimentaron violencia. Cuando los HSH habían experimentado ambos tipos de estresores, el riesgo de baja adherencia TAR fue mayor (RP=6.49 para mes previo) que cuando habían experimentado sólo una de ellas (RP=4.36 para violencia y RP=5.67 para discriminación). Los profesionales de la salud deben ser sensibles a cómo el ambiente sociocultural puede afectar las prácticas de autocuidado de HSH, incluyendo la adherencia al TAR.

Palabras clave: Cumplimiento y Adherencia al Tratamiento; VIH; Fármacos Anti-VIH; Homofobia; Minorías Sexuales y de Género.

Introduction

By the end of 2019 there were about 38 million individuals living with HIV (WHO, 2020). Of new HIV infections globally in 2019, 60% were in key populations, including men who have sex with men (MSM). For Latin America, infection also affects more MSM, explaining why they are 26 times more at risk of infection compared to heterosexuals (UNAIDS, 2020). In Mexico, HIV prevalence among MSM is approximately 20.7% (CENSIDA, 2018), which implies they are 22 times more risk of becoming infected (CENSIDA, 2019).

Adherence to antiretroviral therapy (ART) in people living with HIV allows them to achieve viral suppression, prevent disease progression, and increase their life expectancy (Nakagawa; May; Phillips, 2013). ART-based infection control in people living with HIV is now considered a way to reduce the risk of transmission (Curran; Baeten; Coates, 2012). Likewise, antiretroviral drugs are being prescribed to people living without HIV as a measure to prevent infection (i.e., pre-exposure prophylaxis [PrEP]). PrEP is targeted at key populations, including MSM (Government of Mexico, 2019). Therefore, the study of adherence to ART is not only critical for people living with HIV, but also for its potential implications for MSM on PrEP.

The factors that may affect adherence to ART in MSM living with HIV must be identified. Adherence has been defined as the degree to which a person's behavior (such as taking medications) complies with the recommendations of a health professional (WHO, 2004). Given its behavioral nature, adherence can be affected by people's cognitive processes and mood (Blashill; Perry; Safren, 2011), which, in turn, can be influenced by the sociocultural environment (Ortiz-Hernandez, 2004). Homophobia is related to the sociocultural rules that reproduce negative perceptions about MSM's sexual orientation and, therefore, experiences of homophobia may have negative impacts on adherence to ART in that population. MSM experience different forms of prejudice (which are experienced as chronic stressors) since their sexual orientation is not the prevalent one, in addition to the fact that some adopt or are

thought to adopt feminine traits (Meyer, 2003, Ortiz-Hernández, 2004).

The theoretical model of minority stress was used to understand how homophobia affects the health of MSM. This theoretical model differentiates distal and proximal stressors (Meyer, 2003). Distal stressors comprise experiences of violence and discrimination, while the proximal stressors include subjective processes such as internalized homophobia. In addition, the minority stress theory makes a distinction between structural violence (institutionalized sociocultural norms) and interpersonal violence (that takes place in the interaction between individuals). According to this model, some factors may reduce or mitigate the effect of stressors, including social support and engagement with lesbian, gay, bisexual and transgender (LGBT) groups or communities.

Theoretically, components of minority stress (personal violence and discrimination, and internalized homophobia) could be associated to low adherence to the ART. Internalized homophobia fosters self-rejection, fear of social rejection, low self-esteem, social isolation, self-destructive behaviors, and negative mood (Ortiz-Hernandez; Garcia, 2005a). Likewise, symptoms of depression or psychological distress and suicidal ideation may be also linked to lower adherence to ART (Blashill; Perry; Safren, 2011).

Experiences of discrimination and violence may also lead to lower adherence, as these are associated with psychological distress (Ortiz-Hernández; García, 2005b). Discrimination or violence may produce cognitive rumination, which refers to people having recurrent thoughts (e.g., "What is the cause of the discrimination or violence?" or "How fair or unfair is that kind of treatment?") and emotions (mostly negative ones) related to such experiences (Hatzenbuehler; Pachankis, 2016). Cognitive rumination, in turn, may condition people to face barriers to the adoption and maintenance of self-care practices, as they are mentally and emotionally focused on processing all aspects related to experiences of violence and discrimination (Hatzenbuehler; Pachankis, 2016).

Although HIV epidemic is more concentrated in the MSM population, evidence on the association of minority stress with adherence to ART is generally scanty. We have identified only two studies where internalized homophobia was found to be negatively related to adherence (Johnson; Carrico; Chesney; Chesney, 2008, Gamarel; Neilands; Dilworth, 2015) and another where discrimination against sexual orientation was associated with adherence (Boarts; Bogart; Tabak, 2008). However, the latter relationship was not present in two other samples (Bogart; Wagner; Galvan, 2010; Galvan; Bogart; Klein, 2017). The surveys have been conducted in the United States of America (USA), so studies in the Latin American region are required.

Given the above, the aim of this study was to learn about the relationship of some components of minority stress with adherence to ART in MSM in Mexico City. The main hypothesis tested was that MSM who had suffered interpersonal violence and discrimination or who presented internalized homophobia would be more likely to experience low adherence to ART than their counterparts. A secondary hypothesis was that social support might reduce the impact of minority stressors on adherence to ART.

Material and Methods

This section describes 1) the study design and sample, 2) procedure and variables, and 3) data analysis.

Study design and sample

A cross-sectional survey was conducted with a convenience sampling of persons living with HIV attended in two public health institutions in Mexico City. One of the institutions (HIV clinic of the Regional Hospital Lic. Adolfo López Mateos of the *Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado*, n=100) provides social security and medical care to government workers and their families; while the other (*Clínica Especializada Condesa* - CEC- of the *Secretaría de Salud del Distrito Federal*, n=457) provides medical

care (with free ART included) to those who work in the informal sector and are not covered by social security institutions. The CEC is the most important referral center in Mexico since, of 40,000 people estimated to be living with HIV in Mexico City, 23% (n=9,114) were attended there (Mexico, 2013). The study was conducted in the period from October 2011 to November 2012.

Of the total participants in the study (n=557), 340 were MSM. Only data from the latter are presented in this report. The characteristics of the entire sample were previously published (Ortiz-Hernández; Pérez-Salgado; Compean-Dardón, 2016). MSM were identified with the following question: "With whom have you had sex?" There were seven options to select (e.g., "has not had sex", "only with women", "men and women equally", or "only with men"). Those who selected the first two options were excluded.

The project was approved by the Research Ethics Committee of the *Universidad Autónoma Metropolitana Xochimilco*. Every participant was asked to sign a written informed consent.

Procedure and variables

A questionnaire was applied to record information on participants adherence to ART and their experiences of violence, discrimination (distal stressors) and internalized homophobia (proximal stressor). The questionnaire was administered by nurses trained in interview techniques.

The internalized homophobia scale consisted of 9 items presented in Table 1. The scale developed in the United States of America (Ortiz-Hernández, 2005) has been translated and adapted for use in Mexico (Ortiz-Hernández, 2005, Ortiz-Hernández; García, 2005a). There are five possible responses ranging from "totally disagree" to "totally agree", which were assigned a score from one to five. The participants responses were submitted to an exploratory factor analysis (last column of Table 1). Only one factor emerged, and all items had a factor loading of >0.40. Cronbach's alpha was 0.94. Response scores were summed, and a three-category variable was created: no homophobia (9 items), mild internalized homophobia (10 to 18 items), and internalized homophobia (19 to 39 items).

Table 1 - Distribution of MSM living with HIV in Mexico City according to a scale of internalized homophobia.

	TDA	DA	A-DA	A	TA	Factor analysis
	%	%	%	%	%	
Eigen-value						6.42
% variance						71.3
You frequently feel it is better to avoid personal and social involvement with other homosexuals and bisexuals.	59.4	27.4	6.5	4.1	2.6	0.50
You have tried to stop being attracted to men	64.7	29.4	2.6	2.4	0.9	0.83
If someone offered you the opportunity to be completely heterosexual, you would accept	65.3	27.9	2.9	2.4	1.5	0.83
You wish you were no longer homosexual or bisexual	64.7	27.9	4.4	2.1	0.9	0.90
You feel awkward for being homosexual or bisexual	62.6	30.0	5.6	1.2	0.6	0.90
You wish you could develop more erotic feelings for women	61.8	27.9	6.8	1.8	1.8	0.92
You feel that being homosexual or bisexual is a personal shortcoming	63.2	30.3	5.6	0.6	0.3	0.87
You would like to have professional assistance to become heterosexual	62.9	30.6	4.4	1.5	0.6	0.88
You have tried to be more sexually attracted to women	62.1	29.7	5.3	1.8	1.2	0.87

Abbreviations: MSM, men who have sex with other men; TDA, totally disagree; DA, disagree; A-DA, both agree and disagree; A, agree; and TA, totally agree.

A 10-question scale was used to evaluate experiences of interpersonal violence and discrimination. Table 2 shows the content of each question. The scale was derived from a previous study with the LGBT population of Mexico City (Ortiz-Hernández; García, 2005a). Participants were asked if they had ever in their lives experienced violence or discrimination because "other people believed, suspected or knew that you might be or are bisexual or homosexual". There were four possible responses: never, once, two or three times, and four times or more, which were assigned a score from one to four. The participants responses were subjected to factor analysis in which two factors emerged (see last columns of Table 2). Considering that experiences of violence and discrimination may be associated, the oblique promax rotation was chosen. The first factor included items 6 to 10 (with factor loadings >0.40 on this factor), was named "interpersonal violence" and had a Cronbach's alpha of 0.90. The second factor comprised items 1 to 5, was named "interpersonal discrimination" and had a Cronbach's alpha of 0.81. The responses to the items corresponding to each factor were summed. The score of the responses to the questions in each factor was summed and finally two dichotomous variables were created using the median of each factor as the cut-off point. Responses scored above the median (5 for discrimination and 6 for violence) were considered as to have experienced violence or discrimination.

Table 2 - Distribution of MSM living with HIV in Mexico City according to a scale of violence and discrimination.

	N	1	2-3	³4	F1	F2
	%	%	%	%		
Eigen-value					4.98	1.74
% Variance					49.8	17.4
1. You have been denied a job promotion or salary increase; have been fired, denied a job, or had a similar situation happen to you	74.4	17.6	5.9	2.1	-0.06	0.86
2. You have been denied admission to a school; had a grade reduction; were not recognized for your performance; were mistreated, or had a similar situation happen to you	86.2	7.9	5.6	0.3	-0.07	0.86
3. You have been denied health services in doctor's offices, clinics or hospitals; have been scolded, humiliated or mistreated by a doctor, nurse or other health professionals	83.8	10.0	5.0	1.2	-0.09	0.82
4. You have been denied services in restaurants, movie theaters or other facilities; have been scolded, humiliated or mistreated by waiters, salespersons, businessmen, etc.	80.0	9.7	7.9	2.4	0.40	0.49
5. The police have detained you, expelled you from some place, threatened you, or extorted.	66.8	17.1	12.9	3.2	0.39	0.49
6. You have been insulted or verbally assaulted with words such as "bitch", "pussy", etc.	39.4	19.7	22.6	18.2	0.71	0.06
7. You have been threatened with violence	54.7	15.9	18.2	11.2	0.91	0.01
8. You have been beaten, hit or physically assaulted	58.2	15.9	15.6	10.3	0.89	0.01
9. You have been sexually harassed with obscene or sexual words	46.5	18.8	18.8	15.9	0.90	-0.06
10. You have been robbed, assaulted or had an object of yours damaged or broken	47.6	19.7	15.6	17.1	0.85	-0.16

Abbreviations: MSM, men who have sex with other men; N, never; 1, once; 2-3, two or three times; ³4, four times or more, F1, factor 1 named violence; F2, factor 2, named discrimination.

Adherence to ART was assessed by a question that asked whether the person had failed in taking antiretroviral drugs during the month prior to the interview. This baseline time was chosen to reduce recall bias. It was a yes/no question. When the answer was yes, the respondent was asked how many times he had failed to take the medication. The drafting of these questions was taken from previous studies (Ortiz-Hernández; Pérez-Salgado; Compean-Dardón, 2016). The number of tablets was not asked as the ART schemes were simpler, therefore, asking it would not add further information. At the time of the study the recommended ART consisted of two nucleoside analogue reverse transcriptase inhibitors (NRTIs) (often one tablet) and one non-nucleoside reverse transcriptase inhibitor (one tablet) (CENSIDA, 2012). Based on the number of times that ART had been missed, a new variable was created that identifies low adherence during that period. It was determined low adherence when the person had missed more than 5% of the prescribed doses of the medication. Infection control is achieved with adherence 95%, (Nakagawa; May; Phillips, 2013).

The assessment of social support was performed using the Likert-scale questions of the MOS (Medical Outcomes Study) questionnaire, which was developed in the United States (Sherbourne; Stewart, 1991) and was subsequently translated into spanish and validated for use in persons living with HIV (Remor, 2003). The scale consists of 19 Likert-type questions and the possible responses were assigned a score from 1 (never) to 5 (always). In a factor analysis of the MSM responses, one factor comprising questions 2, 4 to 10, 12, 15, 16, 18 to 20 was observed. Cronbach's Alpha was 0.97. The responses to the items were summed and the resulting variable was dichotomized using the median (62) as the cutoff point.

Age, marital status and sexual orientation of the participants, schooling of the head of household, and food insecurity were considered as covariates. The identity assumed by the participants was considered, for which the following question was applied: "You think you are...?" The possible responses were: "heterosexual only", "bisexual, but more heterosexual", "bisexual", "bisexual but more homosexual", "homosexual only", and "not sure". Those who have responded "homosexual only" were considered "homosexual", while the others were considered "bisexual". The five options for marital status included in the questionnaire were classified into three groups: single; married or in common-law union; and, divorced and widowed.

Food insecurity and schooling of the head of household (i.e., the person who economically supported the family) were used as indicators of socioeconomic status. There were eight options for schooling that were grouped into three categories: high school or less (corresponding to 9 years or less of education), complete high school (12 years of education), and undergraduate or graduate (15 or more years of education). The way in which food insecurity was assessed has been previously described (Ortiz-Hernández; Pérez-Salgado; Compean-Dardón, 2016). Socioeconomic status may be a confounder, as worse socioeconomic conditions are related to both higher levels of internalized homophobia (McGarrity, 2014) and low adherence to ART (Ortiz-Hernández; Pérez-Salgado; Compean-Dardón, 2016). Therefore, the relationship between the latter two could be due to their correlation with the former.

As ART-related covariates, we considered whether the participants had changed the ART scheme and for how long they had taken it. These variables are relevant as people under ART for longer times used schemes with more tablets, and also because they may experience self-care fatigue.

Data analysis

For the descriptive analysis, we have estimated the prevalence of low adherence. To establish whether adherence to ART was associated with any of the distal and proximal stressors, we performed a bivariate analysis using the chi-square test to learn whether there were statistically significant differences between groups, defined according to internalized homophobia and experiences of discrimination and violence. A value of $p<0.050$ was considered statistically significant.

Poisson regression models were estimated using experiences of discrimination and violence as exposures, and low adherence to ART as an

event. Given that violence and discrimination were associated with the adherence variables separately, we estimated models where their interaction was incorporated. From the models, prevalence ratios (PR) were estimated. To test the secondary hypothesis, we estimated models that included the interaction of social support with violence and with discrimination. To facilitate the interpretation of these interactions, the adjusted probabilities of low adherence estimated from the regression models were plotted. All models were adjusted for sociodemographic characteristics and ART-related covariates, as these could act as confounders. Statistical analysis was performed with the software STATA version 15.

Results

The mean age was 34.5 years (standard deviation 10.2); most were single, followed by those who were married or in common-law union (Table 3). The most frequent educational level of the head of household was school diploma, followed by complete high school. More than half of respondents had some degree of food insecurity. Three-quarters of the participants identified themselves as homosexual.

Between 1% and 6% of MSM reported some experience of internalized homophobia, while between 14% and 33% reported some experience of homophobic discrimination, and between 41% and 60% experienced some form of homophobic violence (Tables 1 and 2).

Table 3 - Sociodemographic characteristics of MSM living with HIV in Mexico City (n=340)

Marital Status	%
Single	79.4
Married or in common-law union	15.3
Divorced or widowed	5.3
Sexual orientation	
Homosexual	75.3
Bisexual	24.7
Social support	
Schooling of head of household	
"High school	33.8
High school or school diploma	40.0
Undergraduate or graduate	26.2
Food insecurity	
Food security	40.3
Food insecurity	59.7

MSM, men who have sex with other men

The prevalence of low adherence did not change according to internalized homophobia (Table 4). Individuals who had experienced discrimination or violence had higher frequencies of low adherence compared to those who had not had such experiences. MSM who had experienced discrimination or violence had been more time under ART.

Table 4 - Prevalence of low adherence to antiretroviral treatment according to distal stressors and a proximal stressor in MSM living with HIV in Mexico City.

		Proximal stressor				Distal stressors					
		Internalized homophobia				Interpersonal violence			Interpersonal discrimination		
(n)	Total (340)	SHI (168)	HIL (118)	HI (45)		No (183)	Yes (157)		No (183)	Yes (157)	
	%	%	%	%	p	%	%	p	%	%	p
Low adherence	5.9	6.0	4.1	10.2	0,303	3.3	8.9	0,028	2.7	9.6	0,008
Changed the antiretroviral therapy	41.1	45.8	43.1	20.4	0,005	39.9	42.7	0,603	39.3	43.3	0,459
	M	M	M	M		M	M		M	M	
Length in treatment, years	5.12	5.65	4.59	4.65	0,146	4.46	5.89	0,007	4.61	5.72	0,036

Abbreviations: HSH, men who have sex with men; SHI, no homophobia; HIL, light internalized homophobia; HI, internalized homophobia; M, mean.

After adjusting for sociodemographic characteristics and ART-related covariates, it was found that participants who had experienced violence or discrimination were more likely to have low adherence to ART than those who had not had these experiences (Table 5). The risk of low adherence to ART was higher when participants had experienced both discrimination and violence than when they had experienced only one of these.

The interaction of social support with violence was not significant. The interaction of social support with discrimination was significant (Table 5). Among MSM with social support, the probability of low adherence was 1.63 times higher among those who experienced discrimination (probability: 0.031) than of those who did not experience it (probability: 0.019, see Figure 1). In opposition, among those without social support the probability of low adherence was 3.05 times higher among those who suffered discrimination (probability: 0.156) in relation to those who did not (probability: 0051).

Table 5 - Regression models in which exposures were the distal stressors and the event was low adherence to antiretroviral treatment in MSM living with HIV in Mexico City.

	Low adherence in previous month	
	RP	p
Separate models		
Violence		
No	Ref.	Ref.
Yes	2.60	0,062
Discrimination		
No	Ref.	Ref.
Yes	3.25	0,025
Interaction model 1		
No discrimination or violence	Ref.	
Only violence	4.36	0,115
Only discrimination	5.67	0,050
Discrimination and violence	6.49	0,018
Interaction model 2		
No social support and no violence	Ref.	
No social support and yes violence	2.67	0,161
Yes social support and no violence	0.45	0,348
Yes social support and yes violence	1.11	0,885

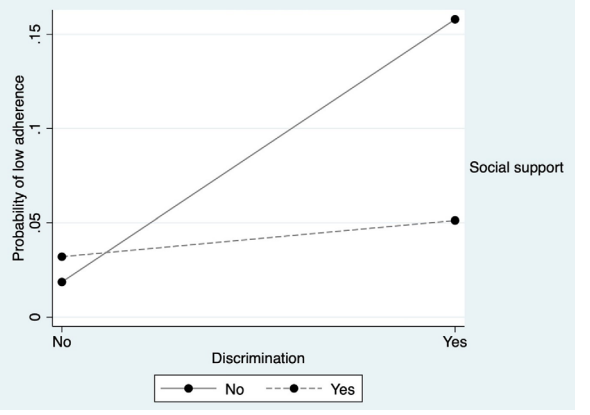
continue...

Table 5 — Continuation

	Low adherence in previous month	
	RP	p
Interaction model 3		
No social support and no discrimination	Ref.	
No social support and yes discrimination	8.12	0,048
No social support and no discrimination	1.63	0,667
Yes social support and yes discrimination	2.66	0,379

Abbreviations: MSM, men who have sex with other men; RP, ratio of prevalence; Ref., group of reference. All models are adjusted for the participants' age, marital status and sexual orientation, schooling of the head of household and food insecurity, length in treatment, and whether they have changed treatment.

Graph 1 - Probability of low adherence to antiretroviral treatment according to social support and discrimination in MSM living with HIV in Mexico City.



Discussion

The survey results partially support our main hypothesis, since MSM who had suffered violence and discrimination were more likely to have low adherence to ART. Similarly, we obtained empirical support to suggest that social support may have a mitigation effect as among MSM who had social support the relation between discrimination experiences and adherence to ART was less strong. However, in MSM who participated in the study, internalized homophobia was not associated with adherence to ART.

In MSM living with HIV in Mexico City, there was no association between internalized homophobia and adherence to ART. The scant evidence on the relationship between internalized homophobia and

adherence to ART in MSM has been inconsistent, as in one study the relationship was not observed (Gamarel; Neilands; Dilworth, 2015), but in another it was (Johnson; Carrico; Chesney, 2008). One of the possible explanations why no association was found in our study is that we assessed an extreme form of internalized homophobia, which is becoming less frequent (as observed in MSM in Mexico City). Internalized homophobia can be manifested in different ways, one of the most extreme is wanting to modify sexual orientation as it is considered an unacceptable quality; at the same time, there are also more subtle expressions such as experiencing shame for being a homosexual male or having negative attitudes to femininity in males, without implying a desire to modify sexual orientation (Ortiz-Hernández; García, 2005a). The expressions of these manifestations have been modified due to the recent cultural changes. Currently, there is an environment of greater acceptance of homosexuality due to the institutional and legal changes that have occurred in recent years (e.g., same-sex marriage was included in the civil code) (Mendoza-Pérez; Ortiz-Hernández, 2020). This less adverse environment may reduce the chance of MSM to experience their sexual orientation in such negative terms that they want to change it.

However, the stigmatization of homosexuality persists in subtle forms (Mendoza-Pérez; Ortiz-Hernández, 2020). Thus, the internalized homophobia is now likely to be also expressed in subtle forms. For example, internalized homophobia in MSM may now be associated with experiences of discomfort, shame, or guilt about their sexual orientation (Ortiz-Hernández, 2005). It has also been suggested that internalized homophobia may be manifested as negative attitudes toward female men (Mendoza-Pérez; Ortiz-Hernández, 2020). Future surveys could evaluate these manifestations of internalized homophobia, and verify whether these are associated with adherence to ART.

Our results suggest that discrimination and violence based on sexual orientation continue to be common experiences among MSM. The most common forms of discrimination were mistreatment by police officers and differential treatment at work, while verbal aggression and sexual harassment were the most common forms of violence. In the Western societies, it has been systematically observed that the LGBT population is subjected to violence due to their sexual orientation or gender identity (Mendoza-Pérez; Ortiz-Hernández, 2020).

In MSM living with HIV from Los Angeles, a trend toward lower adherence to ART was observed among those who had experienced sexual discrimination, although differences were not significant (Bogart; Wagner; Galvan, 2010). Among MSM in Mexico City, experiences of discrimination and homophobic violence were associated with a higher probability of non-adherence to ART. These variables may have a cumulative effect, i.e., the risk of low adherence is greater when both experiences have occurred compared to when only one is present. When suffering homophobia-related violence and discrimination, MSM may perceive that most people have negative attitudes toward their sexual orientation (Mendoza-Pérez; Ortiz-Hernández, 2020). This could lead MSM to raise awareness that they may be victims of violence and discrimination in the future. These expectations may cause them to monitor their behaviors, in an attempt to reduce that possibility, which can be followed by anxiety (García; Parker; Parker, 2016). The expectation of rejection is also a chronic stressor (Meyer, 2003). Notably, the discrimination in health services could have a negative effect on adherence to ART, as lack of trust in physicians is related to lower adherence to ART (Compeán; Pérez-Salgado, 2015). These situations are emotionally draining and cognitively absorbing, so MSM may be less able to maintain practices of self-care (Hatzenbuehler; Pachankis, 2016).

As we expected, the presence of social support mitigated the effect of discrimination on adherence to ART. Social support may reduce the effect of discrimination as individuals may have the ability to manage the negative emotions that such experiences generate, as well as have alternatives to cope with unfair treatment (Doan Van; Mereish; Woulfe, 2019). Future research could explore other protective factors such as resilience or political participation. The former implies that the MSM has personal resources to cope with experiences of prejudice, while the latter requires not only personal acceptance of sexual orientation, but also a collective

questioning of cultural homophobia, thereby rejecting negative assessments on homosexuality. Studying these factors implies recognizing that MSM are also active agents who respond to processes that affect their health and well-being.

The representativeness of the sampling is a limitation of our study, as we only included two public institutions in Mexico City. At the same time, one of the institutions where the study was conducted serves about a quarter of the people living with HIV in Mexico City. An additional limitation in our study is that we used participant's report using questions that have not been validated for use in people living with HIV. However, a correlation between adherence reporting and viral load levels that was observed (Nieuwkerk; Oort, 2005), supporting the assumption that the information provided by people living with HIV is adequate.

In brief, we observed that experiences of discrimination and homophobic violence were associated with lower adherence to ART among MSM in Mexico City. The presence of social support mitigated the effect of discrimination on adherence to ART. There was no association between internalized homophobia and adherence to ART. Given the recent institutional and legal changes, which favor an environment of greater acceptance of homosexuality, subtle forms of internalized homophobia in the population studied should be further assessed.

Final considerations

Our results suggest that health professionals should be sensitive to how the sociocultural environment may negatively affect self-care practices. Then, it would be advisable for clinicians to explore with MSM living with HIV whether they have experienced discrimination or violence, as this may limit adherence to ART. The existence of support networks around MSM should also be assessed and promoted, as these can mitigate the effect of discrimination on adherence to ART. At population level, measures are required that contribute to destigmatize homosexuality, since prejudices against this sexual orientation are triggers of acts of violence and discrimination (Mendoza-Pérez; Ortiz-Hernández, 2020). The legal and institutional changes that took place to protect the rights of the LGBT population in Mexico will continue to contribute to the population's resignification of non-normative sexual orientations and gender identities. In addition, media campaigns are needed to show sexual and gender diversity as part of human nature. Messages about the negative consequences of homophobic violence and discrimination on people can also be broadcast.

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Authors' contributions

Ortiz-Hernández contributed to the research design and data processing. Pérez-Salgado and Miranda-Quezada contributed to data processing. Staines-Orozco and Compean Dardón contributed to the research design. All authors contributed in the discussion of results, as well as in the elaboration of the article.

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