Factors Associated with HIV Testing Among Men Who Have Sex with Men in Three Colombian Cities*

Factores asociados a la realización de pruebas de VIH en Hombres que tienen Sexo con Hombres, en tres ciudades colombianas

Fatores associados ao teste anti-HIV em homens que fazem sexo com homens em três cidades colombianas

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Abstract

Objective: to explore the factors associated with HIV testing in men who have sex with men in three cities in Colombia. Methods: a cross-sectional study was conducted, using respondent-directed sampling, in which 1314 Men Who Have Sex with Men from Bogotá, Medellín, and Cali participated in 2019. Descriptive analyses, bivariate associations, chi-square statistical test of independence and prevalence ratios with their respective confidence intervals, and a binomial log regression, robust estimator, were performed. Results: 50.8% of MSM were tested for HIV in the last 12 months. HIV testing in the past year was twice as likely in MSM younger than 30, 51% more in those who reported having had penetrative sex in the past year with more than 10 people, and 59% more in those who perceived themselves discriminated against. Conclusion: Factors associated with HIV testing in MSM in the country are related to age, education level, number of sexual partners in the last year, access to health services, and perceived discrimination.
Keywords: HIV testing, health services, unsafe sex, perceived discrimination, sexual and gender minorities (DECs).

Resumen

Objetivo: explorar los factores asociados a la realización de pruebas de VIH en Hombres que tienen Sexo con Hombres de tres ciudades de Colombia. Métodos: se realizó un estudio transversal, utilizando el muestreo dirigido por encuestados, en el que participaron 1314 Hombres que tienen Sexo con Hombres de Bogotá, Medellín y Cali en 2019. Se realizaron análisis descriptivos, asociaciones bivariadas prueba estadística chicuadrado de independencia y razones de prevalencia con sus respectivos intervalos de confianza y una regresión log binomial, estimador robusto. Resultados: el 50,8% de los HSH se realizó la prueba de VIH en los últimos 12 meses. La realización de la prueba de VIH en el último año fue dos veces más probable en los HSH menores de 30 años, un 51% más probable en los que reportaron haber tenido relaciones sexuales penetrativas en el último año con más de 10 personas y un 59% mayor en los que se percibieron discriminados. Conclusión: los factores asociados a la realización de pruebas de VIH en HSH en el país tienen que ver con la edad, el nivel educativo, el número de parejas sexuales en el último año, el acceso a servicios de salud, la discriminación percibida.
Palabras clave: Pruebas de VIH, servicios de salud, sexo inseguro, discriminación percibida, minorías sexuales y de género (DeSC).

Resumo

Objetivo: explorar os fatores associados ao teste anti-HIV em homens que fazem sexo com homens em três cidades da Colômbia. Métodos: foi realizado um estudo transversal, por amostragem dirigida por respondentes, do qual participaram 1314 homens que fazem sexo com homens de Bogotá, Medellín e Cali em 2019. Foram realizadas análises descritivas, associações bivariadas, teste estatístico qui-quadrado de independência e razões de prevalência com seus respectivos intervalos de confiança, e regressão logarítmica binomial, estimador robusto. Resultados: 50,8% dos HSH foram testados para HIV nos últimos 12 meses. O teste de HIV no ano passado foi duas vezes mais provável em HSH com menos de 30 anos, 51% mais provável naqueles que relataram ter feito sexo com penetração no último ano com mais de 10 pessoas e 59% mais provável naqueles que se perceberam discriminados. Conclusão: Os fatores associados à testagem anti-HIV em HSH no país estão relacionados à idade, escolaridade, número de parceiros sexuais no último ano, acesso aos serviços de saúde e discriminação percebida.
Palavras-chave: Teste de HIV, serviços de saúde, sexo inseguro, discriminação percebida, minorias sexuais e de gênero (DECs).

1. Introduction

In 2021, according to data from the Joint United Nations Programme on HIV/AIDS (UNAIDS), there were 38.4 million people living with the human immunodeficiency virus (HIV) worldwide. In the same year, 650,000 people died from HIV-related illnesses (1). In Latin America, the number of new HIV infections increased by 21% between 2010 and 2019; however, deaths from AIDS-related illnesses (acquired immunodeficiency syndrome) have decreased by 8% over the past decade (2). The risk of contracting HIV is 35 times higher among people who inject drugs, 34 times higher in transgender women, 26 times higher in sex workers, and 25 times higher in men who have sex with men (MSM). These individuals, considered key population groups, and their partners represent 65% of new HIV infections globally (3).

In Colombia, 13,605 new cases of HIV infection were reported in 2020, with sexual contact being the primary transmission mechanism (98.1%). Of these cases, 81.1% were recorded in men, and 38.3% of the total cases occurred in the age group of 25 to 34 years (4). The highest prevalence of HIV in Colombia has been found in groups with higher vulnerability due to risky behaviors, such as MSM and the transgender population. A study conducted among MSM in three Colombian cities found that HIV prevalence ranged from 11.4% (95% CI 6.9-17.3) to 26.4% (95% CI 20.1-33.1) (5,6). These prevalence rates were associated with factors such as age, educational level, occupation, marital status, and income (5).

To reduce risks and prevent the transmission of infection, the World Health Organization set the 90-90-90 strategy as a goal for 2020 to strengthen the integral response in diagnosis, treatment, and viral suppression. In 2021, UNAIDS reported that by the end of 2019, 81% of people living with HIV worldwide knew their serostatus, 67% were receiving antiretroviral therapy, and about 59% had achieved viral suppression (7). This goal was expanded to 95-95-95 by 2030 to end this epidemic, which poses a threat to public health (8,9). To achieve this target, efforts have been made in the country to expand laboratory capabilities to ensure more people can access testing. The notification rate of HIV cases in Colombia was 24.6 per 100,000 inhabitants in 2016, 27 in 2017, 28.2 in 2018, 33.3 in 2019, and 27.7 in 2020 (10). Of an estimated 150,116 people living with HIV in the country in 2016, 108,648 (72%) had been diagnosed (11). Additionally, according to the High-Cost Account (Cuenta de Alto Costo), 94% of people had access to treatment, and 85% of them achieved viral suppression (12).

HIV testing and counseling are strategies for early detection, especially in key populations such as MSM (13). High-income countries adopted the strategy of voluntary HIV testing two decades ago; later, with the help of international organizations and direct support to ministries of health, it was implemented in middle and low income countries, thus meeting the spontaneous demands of users regarding their serostatus in a shorter time. The strategy consists of two complementary stages: pre-test and post-test, accompanied by counseling, emotional support, and information on the most appropriate risk reduction strategies for the user. These stages offer an opportunity for education and for behavioral change; additionally, they provide an important link to health services for prevention, care, and treatment, which helps reduce transmission and mitigate the

development of other infections that affect people living with HIV quality and expectancy of life (14,15).

Rapid testing has proven to be a cost-effective and significant strategy in HIV prevention; these tests have been implemented in Colombia increasingly since 2013, with the adoption of various clinical practice guidelines, agreements, and resolutions from the Ministry of Health (16). Despite this, persisting barriers have prevented its full implementation. Some studies highlight the existence of misconceptions about HIV detection by both physicians and patients, lack of knowledge about where to get tested, low perception of vulnerability to HIV, fear of being infected (17), lack of availability of HIV testing, and stigma related to the disease (14,18,19).

The United States Center for Disease Control and Prevention (CDC) recommends annual testing in MSM, due to the high prevalence of HIV (20). However, in Colombia, HIV testing is covered by the Health Benefits Plan, but its performance is voluntary. In addition, within the national guidelines there are no recommendations on the frequency with which it should be performed in key populations (21). Therefore, the objective of this study is to explore the factors associated with HIV testing in men who have sex with men in three Colombian cities, this information will serve as evidence for decision makers and those responsible for strengthening strategies for early and timely detection of HIV in key populations.

2. Materials and methods

2.1. Design

An analytical, quantitative, cross-sectional, empirical study was developed as part of the project entitled “Sexual behavior and HIV prevalence in men who have sex with men in three cities in Colombia: Bogotá, Medellín and Santiago de Cali, 2019” (22).

2.2. Participants

Respondent-driven sampling (RDS) was used. This methodology is ideal to achieve sample representativeness in those groups where sampling frame is unknown or receive the name of “hidden populations”, such as MSM; this type of sampling is probabilistic because it is based on network theory, where each member of the population has a known probability of participating in the study. In addition, the data are weighted to correct for the probability of selection; each person has a limit on the number of people to be recruited (23).

For the recruitment process, and considering the RDS theory, 'seeds' were recruited. These seeds were key actors from the study population with a broad and diverse social network in terms of their household economic level. The eligibility criteria for participants were being a

biological male, having had manual, oral, genital, or anal (insertive or receptive) sexual relations or practices with one or more men during the twelve months prior to the study, being of legal age, being Colombian, and living in one of the three study cities. Thirteen seeds were used throughout the process, each receiving three coupons to invite participants to the study. This process was repeated until the sample size was reached in each city. Participants received a primary incentive (a supermarket voucher worth 40,000 COP, approximately 12 USD) and a secondary incentive linked to the successful recruitment of three new participants (cash, 30,000 COP, approximately 9 USD) (22). Data was collected between July and October 2019.

2.3. Instruments and Variables

A virtual questionnaire was constructed in Google Forms, which was applied in a targeted manner to each participant by interviewers with more than 3 years of experience working with MSM population and experience in this type of survey. The survey was designed and adapted according to the guidelines for behavioral surveys in populations at risk of HIV and was adjusted in Colombia by a group of experts from the funding entity (24).

The dependent variable for this study was having tested for HIV in the 12 months prior to the study. The independent variables were classified into three groups. The first group included sociodemographic characteristics such as the household economic level, age, educational level, monthly income, marital status, occupation, and health service payment in the last year. The second group of variables included risk behaviors and personal characteristics, such as condom use, sexual identity, stable male partner, sexual activity with occasional partners, giving and receiving money in exchange for penetrative sex, number of individuals the participant had penetrative sex with in the last 12 months, perception of vulnerability or risk of acquiring HIV, consumption of alcohol, marijuana, cocaine, poppers, ecstasy, and Viagra, and knowledge about HIV. The third group of variables included perception of discrimination for having sex with other men, fear of seeking prevention services, hiding their practices when receiving health care, and fear of having their practices with other men registered in the clinical records.

2.4. Bias

To control bias, interviewers were trained and standardized prior to data collection; quality control was performed throughout the data collection process. In addition, the questionnaire was peer-reviewed.

2.5. Analysis

Absolute and relative frequency measures were calculated for data analysis. The Chi-square statistic was used to identify significant differences. To explore the factors associated with HIV testing, a log binomial regression was used and prevalence ratios (PR) with 95% confidence intervals were obtained. The multivariate model was performed with the variables that showed a p-value <0.05, and whose relationship with the dependent variable had a Nagelkerke R-square

greater than 1% to ensure that each variable contributed significantly to the explanation of the dependent variable. That is how the model is not saturated, and the most parsimonious one is selected, and included variables not presenting collinearity.

2.6. Ethical considerations:

This research was approved by the human ethics committee of the CES University, in session no. 130 of 04 February 2019. The requirements of the Scientific, Technical and Administrative Standards for Health Research were followed, according to Resolution 008430 of October 4, 1993, of the Colombian Ministry of Health, classified as research with minimal risk.

3. Results

3.1. Sociodemographic characteristics of MSM

Out of the 3134 men who have sex with other men, the majority were 30 years old or younger (65.9%), 65.7% had higher education and 86.6% were single. 48.9% were employed, and 27% indicated they were both working and studying. Nonetheless, slightly more than half of the MSM had monthly incomes below the current legal minimum wage. Besides, most (85.2%) of their households lived in low economic level areas. Regarding payments for health services received in the last year, approximately four out of ten reported having paid the moderating fee (a fee intended to regulate the use of health services by affiliates, encouraging appropriate and rational use).

As for HIV testing, it was found that half of MSM have been tested in the last 12 months. Most are under 30 years of age, with higher education, single, working, and report having paid moderating fee in the last year. Table 1.

Table 1. Sociodemographic profile of MSM, according to HIV testing in the last 12 months. In three cities of Colombia, 2019.

Characteristic	HIV testing in the last 12 months		Total	p* value	PR (CI 95%)**
	Yes	No	n(%)		
	n (%)	n (%)			
Age					
>30	148 (22.0)	299 (46.4)	447 (34.0)	< 0.001	1
<= 30	522 (77.9)	345 (53.5)	867 (65.9)		1.81 (1.57 – 2.09)
Education level					
Basic studies	159 (23.7)	245 (38.0)	404 (30.7)	< 0.001	1
Higher education	491 (73.2)	373 (57.9)	864 (65.7)		1.44 (1.26 – 1.65)
No studies	20 (2.98)	26 (4.03)	46 (3.50)		1.10 (0.77 – 1.56)
Income					
No income	168 (25.0)	128 (19.8)	296 (22.5)	0.061	1
< Current minimum legal monthly wage	206 (30.7)	223 (34.6)	429 (32.6)		0.84 (0.73 – 0.97)
>= Current minimum legal monthly wage	296 (44.1)	293 (45.4)	589 (44.8)		0.88 (0.77 - 1.00)
Marital status					
Married / Cohabiting	66 (9.85)	98 (15.2)	164 (12.4)	**0.010***	1
Separated / Divorced / Widowed	5 (0.74)	7 (1.08)	12 (0.91)		1.03 (0.51 - 2.07)
Single	599 (89.4)	539 (83.6)	1138 (86.6)		1.30 (1.07 - 1.58)
Occupation					
Working	301 (44.9)	342 (53.1)	643 (48.9)	< 0.001	1
Looking for a job	55 (8.20)	74 (11.4)	129 (9.81)		0.84 (0.57 - 1.23)
Studying and working	234 (34.9)	124 (19.2)	358 (27.2)		2.14 (1.64 - 2.80)
Other	80 (11.9)	104 (16.1)	184 (14.0)		1.14 (0.82 - 1.59)
Household economic level					
Level 0 -1 - 2 -3	572 (85.3)	548 (85.0)	1120 (85.2)	0.886	1
Level 4 - 5 - 6	98 (14.6)	96 (14.9)	194 (14.7)		1.01 (0.86 - 1.17)
Healthcare service payment (last year)					
No payment	208 (31.0)	240 (37.2)	448 (34.0)	< 0.001	1
Yes, full payment of services	23 (3.43)	24 (3.72)	47 (3.57)		1.05 (0.77 - 1.43)
Yes, moderating fee or partial payment	335 (50)	202 (31.3)	537 (40.8)		1.34 (1.19 - 1.51)
Not consulted in the last year	104 (15.5)	178 (27.6)	282 (21.4)		0.79 (0.66 - 0.95)

Note * P value for the chi-square test, ** raw PR to evaluate the association.
Source: own elaboration.

3.2. Risk behavior and personal characteristics of MSM

It was found that 2.8% of MSM use a condom in their last sexual intercourse, even though most (8 out of 10) have one or more casual partners; 19% reported having received money for sex and 70% reported having had penetrative intercourse with 5 or more people. Half of the participants reported that they perceive themselves to be at risk of acquiring HIV. In terms of psychoactive substance use in the past 12 months, the most commonly used was alcohol (84%), followed by marijuana (39.1%), poppers (25.8%), cocaine (13.6%), ecstasy (8.6%) and Viagra (6.5%). Of the respondents, 4 out of 5 identified themselves as homosexual, 1 out of 3 had a stable male partner and 4 out of 10 were knowledgeable about HIV. Sexual identification, having

given money in exchange for penetrative sex, consuming alcohol or viagra, inhaling poppers and having knowledge about HIV were significantly associated with taking the test. Table 2.

Table 2. MSM risk behaviors, according to HIV test performance in the last 12 months. In three cities in Colombia, 2019.

Characteristic	HIV testing in the last 12 months		Total	p value*	PR (CI 95%)**
	Yes n (%)	No n (%)	n(%)		
Condom use at last sexual intercourse					
Condom use	240 (35.8)	248 (38.5)	488 (37.1)	0.313	1
No condom use	430 (64.1)	396 (61.4)	826 (62.8)		1.05 (0.94 - 1.18)
Sexual identity					
Homosexual	566 (85.2)	504 (78.7)	1070 (82.0)	**0.008***	1
Bisexual and heterosexual	98 (14.7)	136 (21.2)	234 (17.9)		0.79 (0.67 - 0.93)
Has a current stable male partner					
Yes	241 (36.1)	223 (34.6)	464 (35.3)	0.568	1
No	426 (63.8)	421 (65.3)	847 (64.6)		0.96 (0.86 - 1.08)
Sexual activity with casual partners in the past year					
No	120 (17.9)	131 (20.3)	251 (19.1)	0.262	1
Yes	550 (82.0)	513 (79.6)	1063 (80.8)		1.08 (0.93 - 1.24)
Received money in exchange for penetrative sex					
No	550 (82.3)	514 (79.9)	1064 (81.1)	0.267	1
Yes	118 (17.6)	129 (20.0)	247 (18.8)		0.92 (0.80 - 1.06)
Gave money in exchange for penetrative sex					
No	610 (91.0)	542 (84.1)	1152 (87.6)	**0.000***	1
Yes	60 (8.95)	102 (15.8)	162 (12.3)		0.69 (0.56 - 0.86)
Number of penetrative partners in the last 12 months					
1 to 4 people	309 (46.1)	341 (52.9)	650 (49.4)	**0.057**	1
5 to 10 people	197 (29.4)	191 (29.6)	388 (29.5)		1.06 (0.94 - 1.21)
More than 10 people	164 (24.4)	112 (17.3)	276 (41.1)		1.24 (1.10 - 1.41)
Perceived vulnerability or risk of HIV acquisition or re-infection					
No	275 (41.0)	293 (46.0)	568 (43.4)	0.399	1
Si	395 (58.9)	343 (53.9)	738 (56.5)		1.10 (0.99 - 1.23)
Drinking alcohol					
No	92 (13.7)	118 (18.3)	210 (15.9)	**0.023***	1
Yes	578 (86.2)	526 (81.6)	1104 (84.0)		1.19 (1.01 - 1.40)
Smoking marijuana					
No	391 (58.3)	408 (63.3)	799 (60.8)	0.063	1
Yes	279 (41.6)	236 (36.6)	515 (39.1)		1.10 (0.99 - 1.23)
Inhaling cocaine					
No	577 (86.1)	558 (86.6)	1135 (86.3)	0.78	1
Yes	93 (13.8)	86 (13.3)	179 (13.6)		1.02 (0.87 - 1.18)
Inhaling poppers					
No	472 (70.4)	502 (77.9)	974 (74.1)	**0.002***	1
Ecstasy					
No	612 (91.3)	596 (92.5)	1208 (91.9)	0.423	1
Yes	58 (8.65)	48 (7.45)	106 (8.06)		1.08 (0.90 - 1.29)
Viagra					
No	637 (95.0)	591 (91.7)	1228 (93.4)	**0.015***	1
Yes	33 (4.92)	53 (8.22)	86 (6.54)		0.73 (0.56 - 0.97)
Knowledge about HIV					
No	360 (53.7)	379 (58.8)	739 (56.2)	**0.012***	1
Yes	310 (46.2)	265 (41.1)	575 (43.7)		1.10 (0.99 - 1.23)

Note * P value for the chi-square test, ** raw PR to evaluate the association.
Source: own elaboration.

3.3. Perception of Discrimination and Access to Health Services for MSM

21% of individuals indicated they felt discriminated, 62% of them accessed early HIV testing in the last 12 months. 10% reported avoiding these services, and, in thi group, 3 out of 10 accessed HIV testing in the last 12 months. Those who did not get tested in the last 12 months did not do it, mostly for fear that their MSM status would be registered in the medical records (43.2%).

The probability of being tested for HIV was 30% lower in those who indicated that they had avoided seeking prevention services for fear of being stigmatized, those who did not disclose their sexual practices when receiving health care, and also, those who feared that this would be recorded in their medical history. Table 2.

The probability of having been tested for HIV in the last year was observed to be significantly higher in those who felt discriminated against, in those who avoided seeking prevention services, diagnostic tests or treatment, and in those who do not hide their sexual practice when receiving health care Table 3.

Table 3. Perception of discrimination and access to health services of MSM, according to HIV testing in the last 12 months. In three cities in Colombia, 2019.

Characteristic	HIV testing in the last 12 months		Total n(%)	p value*	PR (CI 95%)**
	Yes n (%)	No n (%)			
Perception of discrimination					
No	497 (74.2)	541(84)	1038 (79)	0.040*	1
Yes	173 (25.8)	103 (16)	276 (21)		1.30 (1.17 - 1.46)
Has avoided seeking prevention services. HIV testing and/or treatment because of fear of stigma					
No	652 (97.3)	609 (94.5)	1261 (95.9)	0.006*	1.52 (1.04 - 2.22)
Yes	18 (2.68)	35 (5.43)	53 (4.03)		1
Hides his sexual practice with other men when receiving health care					
No	599 (89.4)	524 (81.3)	1123 (85.4)	< 0.001	1.43 (1.18 - 1.73)
Yes	71 (10.5)	120 (18.6)	191 (14.5)		1
Fear of having their sexual practice with other men registered in medical records					
No	557 (83.1)	496 (77.0)	1053 (80.1)	0.005*	1.22 (1.05 - 1.41)
Yes	113 (16.8)	148 (22.9)	261 (19.8)		1

Note * P value for the chi-square test, ** raw PR to evaluate the association.
Source: own elaboration.

3.4. Factors that increase or decrease the likelihood of HIV testing in MSM

Taking an HIV test in the last year was twice as likely in MSM under 30 years of age, 30% more likely in those who reported having had penetrative sex in the last year with more than 10 people, and 59% more likely in those who perceived themselves to be discriminated against.

On the other hand, this probability of being tested was lower in those who reported having basic education compared to those with higher education. Table 4.

Table 4. Explanatory model of factors related to HIV diagnostic testing in three cities of Colombia, 2019.

Characteristic	p value*	PRc (CI 95%)**	p value***	PRa (CI 95%)****
Age				
>30	< 0.001	1		1
<= 30		1.81 (1.57 - 2.09)	< 0.001	**2.54 (1.89 - 3.40)**
Education level				
Basic studies		1		1
Higher education	< 0.001	1.44 (1.26 - 1.65)	0.177	**2.07 (1.07- 3.9)**
No studies		1.10 (0.77 - 1.56)	0.007	**1.45 (1.11 – 1.89)**
Occupation				
Working		1		1
Looking for a job	< 0.001	0.91 (0.73 - 1.13)	0.187	0.75 (0.54 - 1.14)
Studying and working		1.39 (1.24 - 1.56)	0.083	1.3 (0.96 - 1.78)
Other		0.92 (0.77 - 1.11)	0.117	0.75 (0.52 - 1.074)
Healthcare service payment (last year)				
No payment		1		
Yes. full payment of services		1.05 (0.77 - 1.43)	0.002	**0.59 (0.43 - 0.82)**
Yes. moderating fee or partial payment	< 0.001	1.34 (1.19 - 1.51)	0.666	0.86 (0.45 - 1.64)
Not consulted in the last year		0.79 (0.66 - 0.95)	0.002	**1.55 (1.18 - 2.05)**
Gave money in exchange for penetrative sex				
No	< 0.001	1		
Yes		0.69 (0.56 - 0.86)	0.314	0.82 (0.55 - 1.2)
Number of penetrative partners in the last 12 months				
1 to 4 people	0.057	1		
5 to 10 people		1.06 (0.94 - 1.21)	0.840	1.02 (0.78 - 1.35)
More than 10 people		1.24 (1.10 - 1.41)	0.010	**1.51 (1.10 - 2.07)**
Inhaling poppers				
No	0.002	1		
Yes		1.20 (1.07 - 1.34)	0.363	1.13 (0.86 - 1.5)
Perception of discrimination				
No	0.040	1		
Yes		1.30 (1.17 - 1.46)	< 0.001	**1.59 (1.19 - 2.13)**

Note* Chi-square of independence, ** Raw PR to evaluate the association, *** p value for the Wald statistic for the final model, **** Adjusted PR of the final model to evaluate the association.
Source: own elaboration.

4. Discussion

This study described the factors associated with HIV testing among MSM in Colombia. Results show that half of the respondents had been tested in the year prior to the survey, and that some sociodemographic, behavioral factors, as well as factor related to healthcare services use and access, and discrimination, play an important role in this practice. Therefore, being under 30 years old, having a university education, being single, studying and working, having more than 10 sexual partners per year, consuming alcohol and poppers, not consulting health services and perceiving discrimination increase the probability of being tested for HIV in MSM.

Highly educated, studying and working young people are more likely to be tested in the last year, because they have greater access to information about HIV (25). According to other studies, the likelihood of annual testing increases among those over 30 years of age, (26-28), most studies show that young people are a low testing rate group (29,30), which differs with our results. Because of this, young people are often prioritized in testing strategies because of their risk behaviors. Younger people currently have higher levels of education, less social pressure on homosexuality and greater access to information about HIV, which makes their testing behaviors positive (31).

Sexual behaviors among MSM (32), such as consuming alcohol and other illegal psychoactive substances, not using condoms frequently, having multiple sexual partners and paying for sex, have been widely reported in the literature as risk factors for acquiring HIV (33,34). In this study, those who reported having more than 10 sexual partners per year were more likely to be tested, a situation that may be explained by a higher risk perception (31).

Among MSM with risk factors, testing should be performed at least twice a year (35). Alcohol and poppers consumption has been associated with an increase in the number of casual sexual partners, low condom use, and HIV infection (36), and visiting homosocialization sites, cruising spots, saunas, and the use of sex finding apps or websites (37). In Colombia, specific interventions have been carried out in these places, using rapid HIV testing in key populations, and more recently with the introduction of HIV self-testing (38). that is why in this study, MSM with these characteristics are more likely to be tested in the last year and do not consult health services. These individuals, with risk behaviors, are potential recipients of HIV pre-exposure prophylaxis (PrEP) to prevent HIV infection (30).

Discrimination against MSM has an impact on healthcare seeking, not only decreasing it in issues related to STIs (31) but also to other pathologies. Studies have shown that in this population there is greater distrust towards medical staff, compared to heterosexual men. In this population, there is a belief that healthcare providers are not well-informed to manage the needs of MSM (32). However, the results of this study show that discrimination is associated with HIV testing.

A study in Mozambique reported that a widespread HIV testing program had a negative or unintended effect on the population by decreasing testing rates and worsening HIV-related stigmatizing attitudes. There appears to be a high social cost to disclosing or accepting that someone is at risk of HIV infection (42).

Regarding the frequency of testing, there is significant progress when we compare the percentage of annual testing in this study (50.8%) with another study conducted in Colombia in 2014, which included 890 MSM, where only 33% was found (43). It is also notable that the proportion of HIV testing in MSM is higher than that found in the general population in the

country, where only 30.2% of men have been tested once in their lives and 6.5% in the last year (44).

According to Alzate et al, in Colombia there has been progress in HIV prevention as an essential aspect of public health, with education and promotion strategies on condom use (45), strategies such as increasing the coverage of screening programs, injection of resources by international organizations, efforts by the Ministry of Health and Social Protection, and the implementation of the National Plan for Response to STIs (Sexually Transmitted Infections), HIV, TB/HIV co-infection and Hepatitis B and C, Colombia, 2018 - 2021 (46).

Worldwide statistics show that in African MSM the estimated proportion of testing is close to 50.1% (47), in the United States 58%, in China 57.1% (48), in Europe between 35.5% and 66.2% and in a lower percentage, 31.8%, in Cuban MSM (49). The goal set by UNAIDS is that by 2030 at least 95% of people living with HIV (PLHIV) should know their status. For countries, it implies a significant increase in HIV screening coverage especially in key populations, in addition to the implementation of more innovative strategies.

In agreement with the Pan American Health Organization, HIV testing services should promote demand, incorporate HIV self-testing, encourage testing by non-professional providers, include counseling, add other tests to detect STIs, improve quality of testing, and connect to appropriate prevention services. Although it could be said that these strategies are already being implemented in Colombia, multiple health system barriers have been reported when confirming a diagnosis, accessing to appointments with an infectologist or other specialists, as well as initiating promptly antiretroviral treatment. It is necessary to implement more effective and integrated care pathways (45).

As this was a cross-sectional investigation, it was not possible to establish temporal sequence or causality. In some cases MSM may forget details in some questions, as they are based on self-reporting; the RDS is considered a social network-dependent sample, which may have limitations when reporting population estimates, affecting the generalizability of the results obtained.

5. Conclusions

Factors associated with HIV testing in MSM in the country are related to age, educational level, number of sexual partners in the last year, access to health services, perceived discrimination, etc. The screening strategy for this population should be a public health priority, in addition to minimizing social barriers, reducing stigma and discrimination, and integrating HIV services within the health system, promoting an expanded response. It is suggested to strengthen combined prevention, including biomedical, community, behavioral and structural interventions to meet the HIV prevention needs of specific individuals and communities. Furthermore, there is a clear need for public health policies that not only expand access to HIV testing but also educate and promote its importance, especially among educationally underprivileged populations.

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Conflict of interests

Authors declare that they have no conflict of interest.

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Notes

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