HIV Testing Among Young Latino Men Who Have Sex with Men (MSM): The Role of HIV-Related Stigma and Internalized Homosexual Stigma

Larissa Stassek

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Rosa Solorio

Jane Simoni

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Abstract

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Larissa Stassek

Chair of the Supervisory Committee:

Rosa Solorio, Assistant Professor

Health Services

Background

In the United States HIV incidence among young men who have sex with men (MSM) is increasing. Young Latino MSM are disproportionately affected by HIV infection and delayed diagnosis. HIV-related and homosexual-related stigma have been proposed as possible barriers to HIV testing.

Methods

This study reports on baseline data from a longitudinal cohort of 50 young Latino immigrant MSM (ages 18-30 years) living in Seattle, Washington. The men were recruited using respondent driven sampling and interviewed using audio computer-assisted self-interviews. The interviews assessed sociodemographic characteristics, sexual risk factors, stigma (internalized HIV-related stigma, anticipated HIV-related stigma, and internalized homosexual stigma), HIV testing history, and intentions to test for HIV in the next three months. Bivariate and multivariate analyses focused on the relations between sociodemographic characteristics, stigma, and past HIV testing; similar analyses were conducted for intentions to test for HIV in the next three months.

Results

Eighty-two percent of our sample had undergone HIV testing in their lifetime, but only 60% intended to test for HIV in the next three months. Among all three types of stigma, anticipated HIV-related stigma had the highest average score. In the bivariate logistic regression analysis, having more education, having a current male sexual partner, and self-identifying as homosexual or bisexual/other were significantly associated with increased odds of ever having tested for HIV. In addition, in the bivariate analysis, participants currently married or in a formal or informal partnership or living with someone were less likely to intend to test for HIV in the next three months when compared with single or previously married individuals. In a multivariable logistic regression analysis, only higher level of education and self-identifying as homosexual or bisexual/other were significantly associated with increased odds of having ever tested for HIV. None of the three types of stigma were significantly associated with past testing or with intent to test for HIV in the next three months.

Conclusions

The findings suggest that Latino MSM most in need of outreach may be less-educated men who do not identify as homosexual or bisexual. Further evaluation of the association between the different types of stigma and HIV testing are warranted for this cohort of men, using the longitudinal data.

INTRODUCTION

Incidence of HIV is increasing among men who have sex with men (MSM) in the United States (US), and young MSM have been particularly impacted (CDC 2012). Overall incidence in MSM increased by 12% from 2008 to 2010, whereas incidence specifically in young MSM (ages 13-24 years) increased by 22% during the same period (CDC 2012). Latino men continue to be disproportionately affected by HIV infection, with a diagnosis rate nearly three times that of non-Latino white males (CDC 2012). In 2010, Latinos represented 16% of the US population, but accounted for 21% of new HIV infections (CDC 2013). A need exists for interventions targeting Latino MSM to be developed.

Late HIV diagnosis hinders prevention of HIV transmission in the Latino community (Millet et al. 2011, Young et al. 2011). Nationwide, it is estimated that 46% of HIV-positive Latino MSM are unaware of their status—in comparison with 26% of HIV-positive white MSM (Lauby et al. 2012). Studies have shown that when individuals learn they are HIV positive, they are more likely to take steps to reduce risk of transmission, and are also able to start treatment (Chesney and Smith 1999, Weinhardt et al. 1999). HIV testing can also serve as a valuable point of entry into the health system for immigrant Latinos, which may allow them to gain access to other needed services and counseling (Gilbert and Rhodes 2013). When compared with non-Latino white MSM, Latino MSM have been found to be less likely to know their HIV status and less likely to perform an HIV test at least yearly (CDC 2011). This means that, compared to other ethnic groups, Latino MSM are diagnosed later, progress to AIDS more quickly, and have worse health outcomes (Lechuga et al. 2013, Chen et al. 2012).

An important barrier to HIV testing is stigma, and there is evidence that MSM of color may experience higher levels of HIV-related and homosexual-related stigma than other men

(Millet et al. 2011, Chesney and Smith 1999, Brooks et al. 2005, Young et al. 2011, Mahajan et al 2008). In the United States, HIV-related stigma is closely related to negative feelings toward homosexuality (Brooks et al. 2005, Devine et al. 1999). The HIV epidemic in the US has disproportionately affected MSM from the start, and HIV is still heavily associated with such groups as homosexuals and sex workers and such behaviors as injection drug use and casual sex (Brown et al. 2001). Many people delay or forego testing because they believe that testing for HIV equates to disclosing they have participated in a stigmatized behavior (Brooks et al. 2005). Others choose not to test because they do not identify as belonging to a high-risk group and thus do not consider themselves at risk (Goldin 1994, Stall et al. 1996, Chesney and Smith 1999, Lopez-Quintero et al. 2005, Fernandez et al. 2002, Dowson et al. 2012, Gilbert and Rhodes 2013, Golub and Gamarel 2013, Solorio et al. 2013, Wong 2013).

Many cultural constructs may help explain low HIV testing rates and high stigma among Latinos—including *machismo*, *la familia*, religiosity, and fatalism. *Machismo* is a cultural construct describing the expectation that Latino men assert their masculinity—often leading to increased risky sexual behaviors (Marin 2003, Meyer and Champion 2008, Jarama et al. 2005). The construct of *la familia* is also important to consider as, for many Latinos, being accepted by their families is more important than their own happiness and well-being (Meyer and Champion 2008). This can lead to secrecy around sexuality and sexual behavior, which can in turn result in increased sexual risk behaviors such as having multiple partners and decreased protective behaviors such as HIV screening and condom use (Meyer and Champion 2008, Marin 2003, Williams et al. 2004, Padilla et al. 2008). Religiosity is a further important cultural construct in Latino MSM (Meyer and Champion 2008, Williams et al. 2004, Solorio et al. 2013). Belonging to a religion that is outspoken against homosexuality may engender feelings of guilt around

homosexual behaviors, and such guilt has been associated with increased risky behaviors such as unprotected anal intercourse and alcohol abuse (Meyer and Champion 2008, Williams et al. 2004). Finally, although HIV treatment has been greatly improved over the years, a recent study of Latino MSM found that fatalistic beliefs are still prevalent among some Latino MSM (Solorio et al. 2013).

Few studies to date have investigated the associations between HIV-related or homosexual stigma and HIV-testing behaviors specifically within Latino MSM, and many previous studies focused on HIV-seropositive MSM (Williams et al. 2004, Young et al. 2011, Molina and Ramirez-Valles 2013, Rock Wohl et al. 2013). Numerous studies also combined "MSM of color," but there are important cultural differences among these subgroups that should not be overlooked. One such study of HIV-seropositive "ethnic MSM" in Los Angeles in 2011 found higher internalized homosexual stigma scores were associated with unrecognized HIV infection (Young et al. 2011). Another recent study of Latino immigrant sexual and gender minorities (MSM, transgender, or gender variant) in North Carolina found that reasons for not undergoing HIV testing included concerns that others might treat the person differently if they tested positive (Gilbert and Rhodes 2013). A study of Latino immigrant MSM found that MSM self-identifying as gay were more likely to perform HIV testing than MSM who did not self-identify as gay (Solorio et al. 2013).

Our study investigated the relationship between stigma and HIV testing behaviors within a group of non-English speaking young Latino MSM living in the Seattle area who were predominantly Mexican immigrants. The HIV Stigma Framework proposed by Earnshaw and Chaudoir suggested that stigma can be categorized as internalized, anticipated, or enacted (Earnshaw et al. 2013). Internalized stigma refers to having negative feelings and attitudes

surrounding a disease or sexuality and applying them to the self; anticipated stigma comprises expected discrimination and prejudice from others due to having a certain disease or sexuality; and enacted stigma consists of actual experienced discrimination and stereotyping by others (Earnshaw et al. 2013). Based on this framework and our literature review, we chose to investigate three types of stigma in our study population: internalized HIV-related stigma, anticipated HIV-related stigma, and internalized homosexual stigma. The objective of the present study was therefore to assess the association of these three types of stigma with both past HIV testing and future HIV testing intentions. Based on previous work, our a priori hypothesis was that higher levels of the HIV-related stigmas and internalized homosexual stigma would be associated with lower rates of past HIV-testing and lower intentions to undergo HIV testing in the future. We also hypothesized that participants self-identifying as homosexual would have higher prevalence of past HIV testing and greater intention to test for HIV in the next three months than participants self-identifying as heterosexual or bisexual. Our study could help inform future HIV prevention programs for Latino immigrant MSM living in the Pacific Northwest.

METHODS

Participants

Tu Amigo Pepe is a social marketing campaign aimed at increasing uptake of HIV-testing among young Latino MSM in the Seattle area. A cohort of 50 young (ages 18-30 years) Latino MSM was recruited using respondent-driven sampling (RDS). RDS is a useful chain-referral method that allows researchers to recruit "hidden" populations when a sufficient sampling frame cannot be developed (Gilbert et al. 2013). Participants were recruited from community venues—including community events, sexually transmitted disease clinics,

community-based organizations, and entertainment venues—as well as Latino newspapers, flyers, and the internet. Sampling began with these non-randomly selected initial recruits, or "seeds," from the target population who met the study eligibility criteria. Each seed then was able to start a chain of referral by recruiting eligible peers, who in turn were able to recruit additional peers to participate. In RDS, this process continues until the target sample size is reached (Johnston et al. 2006). Participants received twenty dollars for every additional eligible subject they recruited. Eligible individuals: a) were biologically male; b) were between the ages of 18 and 30 years; c) self-identified as having Latino heritage (e.g., born in a Latin American country); d) were Spanish speaking; e) lived in King County, Washington; f) had no HIV testing in the past 12 months; g) had an unknown or negative HIV serostatus; and h) reported a history of having sex with men. This study was approved by the University of Washington Institutional Review Board.

Procedures

All participants completed an audio computer-assisted self-interview on HIV-testing behaviors and attitudes, as well as their opinions toward the *Tu Amigo Pepe* campaign, risk behaviors such as condom use, and social factors including three types of stigma. Each participant will complete the survey three times—at baseline (before the campaign began) three months into the campaign, and three months post-campaign. The present study design was cross-sectional in nature, and used only the data collected during the baseline assessment. All data was self-reported, and all surveys were completed in Spanish.

Measures

Sociodemographic characteristics, sexual risk behaviors, HIV testing behaviors, and HIV-related and homosexual-related stigmas were assessed in the interview. The measures are described below.

Independent Variables

Sociodemographic characteristics. Age, country of birth, acculturation, education, marital status, employment, income, and self-identified sexual orientation were assessed. Marital status was categorized as follows for our analyses: (1) currently single (including those never married and those previously married), (2) currently married or in a partnership, and (3) currently in an informal partnership or living together. Education was categorized as: (1) less than high school or (2) high school or above (including GED). Employment was categorized as: (1) working full-time or (2) working part-time or unemployed. Other factors were categorized as follows: acculturation (less than or greater than five years living in the United States), income (less than or greater than $20,000 in the past year), and self-reported sexual orientation (homosexual/gay, heterosexual/straight, or bisexual/other).

Sexual risk behaviors. Number of sexual partners (continuous) in the past three months and sex of current partner (male or female) were assessed.

HIV testing awareness. Exposure to HIV-testing ads in the past three months (yes or no) was measured.

Stigma. Three types of stigma were assessed, including internalized HIV-related stigma, anticipated HIV-related stigma, and internalized homosexual stigma.

To measure internalized and anticipated HIV-related stigma, participants responded to 11 statements indicating their level of agreement using an 11-point scale with adjectival anchors

(zero being "Totally Disagree" and 10 being "Totally Agree"). The first five of these questions were adapted from MacPherson et al. (2011) to measure internalized HIV-related stigma (referred to as "stigmatizing attitudes" in the original study). We did not include four of the questions from the original scale (For example, "Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV?"), because we did not believe they were relevant for our population. We also made minor changes to the phrasing of one question to make it more appropriate for a MSM population (We changed "If a married person goes for HIV testing, he/she must be unfaithful" to "If a person in a stable relationship goes for HIV testing, he/she must be unfaithful"). The next six questions, taken directly from MacPherson et al. (2011), measured anticipated HIV-related stigma.

Our 13-question internalized homosexual stigma scale was taken from Ramirez-Valles et al. (2010), with one additional question added from Visser et al. (2008). The additional question, "I think that getting HIV is a punishment for bad behavior," was added because we felt it would encompass the religious guilt experienced by many Latino MSM as a result of homosexual behaviors.

Scores for internalized HIV-related stigma (questions 1-5), anticipated HIV-related stigma (questions 6-11), and internalized homosexual stigma (questions 12-24) were calculated by averaging each respondent's answers (with reverse coding on one question in the anticipated stigma scale). For all three scales, higher scores indicated greater stigma, and possible scores ranged from zero to 10. These averaged scores were then divided into two categories: no stigma and some stigma for internalized HIV-related stigma; and low stigma and medium/high stigma for anticipated HIV-related stigma and internalized homosexual stigma (see Tables 1 and 2). We were unable to maintain a separate "medium" category due to sample size limitations. If

respondents did not answer every question in each section, they were given an average score based on the answers provided. Please see the appendix for the full list of questions.

Dependent Variables

Past HIV testing. Past HIV testing was assessed with the following question: "Have you ever had an HIV test?" Respondents chose "yes" or "no," and were categorized as such.

HIV testing intention. Intention to seek HIV testing in the next three months was measured using an aggregate score from the following three questions: "How likely are you to get tested for HIV in the next three months," "How much do you want to be tested for HIV in the next three months," and "How much do you intend to be tested for HIV in the next three months?" These questions were also answered using an 11-point scale with adjectival anchors (zero being "Very Unlikely" and 10 being "Very Likely"). We calculated average scores for each participant, and categorized each as "likely to test for HIV in the next three months" if they had an average score 5.5 or above, and "unlikely to test for HIV in the next three months" if they had an average score less than 5.5.

Data Analysis

Descriptive statistics were used to describe the characteristics of participants, as well as to determine the prevalence of internalized HIV-related stigma, anticipated HIV-related stigma, internalized homosexual stigma, past HIV testing, and HIV testing intentions in the cohort of Latino MSM. Sample means, standard deviations, and proportions were also calculated where appropriate.

Next, we conducted bivariate tests of association using logistic regression with each of the independent variables (age, country of birth, acculturation, education, marital status, employment, income, self-identified sexual orientation, number of sexual partners in the past

three months, sex of current partner, exposure to HIV-testing ads in the past three months, internalized HIV-related stigma, anticipated HIV-related stigma, and internalized homosexual stigma) in order to identify possible correlates of our two dependent variables—past HIV-testing and future HIV-testing intentions. Small cell counts required exact logistic regression in a few cases.

All variables with associations significant at $p< 0.25$ in the bivariate analyses were considered in the construction of a multivariable logistic regression model, as suggested by Gilbert and Rhodes (2013). Due to sample size limitations, all variables significant at this level could not be retained and backwards step-wise regression was used to form the two final multivariable models. All calculations were conducted with un-weighted data, because our aim was to describe prevalence and associations within the sample and not to create population estimates. Adjusted odds ratios (aOR), 95% confidence intervals, and p-values were reported for the two final multivariable models. All analyses were completed with Stata Version 13 (StataCorp LP, College Station, TX).

RESULTS

Participant Characteristics

Fifty Latino MSM completed the baseline survey. The average age of participants was 25 years (SD 0.42). Only 16% of participants were born in the United States, 76% were born in Mexico, and the remaining 8% of participants indicated being born in another Latin American country. The participants born in another Latin American country were combined with those born in Mexico for our analyses. Of the foreign-born participants, the average number of years living in the US was 7.1 (SD 0.83). About half (46.2%) had lived in the US for five or fewer years, and the remaining 53.8% had lived in the US for more than five years. Most participants

(81.6%) had completed high school (or GED) or had more education. The majority of participants were single and had never married (66%), whereas 18% were currently married or in a legal partnership, 10% were in an informal partnership or living together, and 6% were previously married, but divorced or separated. This final category was combined with the "single" group for our analyses. The average number of sexual partners reported in the past three months was 3.82 (SD 0.62). Most participants (87.1%) reported having a current male sexual partner. The majority (66.7%) indicated currently working full-time (35 or greater hours a week), with 20.8% reporting working part-time (less than 35 hours a week), 6.3% indicating being unemployed or disabled, and the remaining 2.3% being full-time students. The final three categories were collapsed into a single category for our analyses. Most (69.2%) reported an annual income between $10,000 and $30,000 in the previous year, whereas 19.2% reported less than $10,000, and 11.5% reported an annual income above $30,000. We collapsed these into two categories for our analyses ($20,000 or less; $20,001 or more). The majority of participants (69.4%) self-identified as homosexual ("gay"), whereas 10.2% identified as heterosexual ("straight") and 20.4% as bisexual or "other". Only 9.3% of participants indicated having been exposed to HIV-testing ads in the past three months. Eighty-two percent of participants indicated having had at least one HIV test in their lifetime. However, only 60% of participants indicated a strong intention to test for HIV in the next three months. Importantly, 22% of participants indicated having the highest intent possible on our scale to test in the next three months. Internalized HIV-related stigma was relatively low in our sample, with 62% of participants having an average score of zero. The average internalized HIV-related stigma score was only 0.65 (SD 0.16) out of the possible 10. Anticipated HIV-related stigma was more prevalent, with 40% of participants having a medium/high score. The average anticipated HIV-

related stigma score for the group was 3.15 (SD 0.30). Internalized homosexual stigma was moderate, with 22% of participants having a medium/high score; the group's average score was 1.90 (SD 0.28). None of the three stigma variables were significantly associated with self-identified sexual orientation.

Correlates of Past HIV Testing

In bivariate analyses with past HIV testing, five independent variables met the $p<0.25$ inclusion criteria described by Gilbert and Rhodes (2013): education, sex of current partner, self-identified sexual orientation, internalized HIV-related stigma, and internalized homosexual stigma (see Table 2). Sex of current partner was removed from the final multivariable model because of its small cell counts. We added our anticipated HIV-related stigma variable to the final model, because it was one of our main independent variables of interest.

Our multivariable logistic regression for past HIV testing therefore included education, self-identified sexual orientation, and all three stigma variables. Only two variables were found to be significant at the $p<0.05$ level. Education was positively associated with past HIV testing. Compared to having less than a high school education or GED, completing any additional education was associated with greatly increased odds of having ever tested for HIV (aOR 73.79; 95% CI 2.69, 2026.22; p=0.011). Sexual orientation was also significantly associated with past HIV testing. Identifying as homosexual ("gay") increased odds of past testing when compared to those identifying as heterosexual ("straight") (aOR 60.13; 95% CI 2.18, 1654.94; p=0.015), and identifying as bisexual or other also increased odds of past testing when compared to those identifying as heterosexual (aOR 118.98; 95% CI 1.64, 8626.93; p=0.029). None of the three stigma variables were significantly associated with past HIV testing in our multivariable model.

Correlates of Intentions to Test for HIV in the Next Three Months

In bivariate analyses with intentions to test for HIV in the next three months, five independent variables met our $p<0.25$ inclusion criteria: marital status, sex of current partner, sexual orientation, internalized HIV-related stigma, and internalized homosexual stigma. Sex of current partner was also removed from this final multivariable model because of its small cell counts. Anticipated HIV-related stigma was also added to this model.

Our multivariable logistic regression for intentions to test in the next three months therefore included marital status, sexual orientation, and all three stigma variables. No variables were significant at the $p<0.05$ level for this model, but homosexual orientation approached significance, with participants identifying as homosexual or gay being more than ten times more likely to intend to test for HIV in the next three months than participants who identified as heterosexual or straight (aOR 10.57; 95% CI 0.85, 132.09; $p=0.067$). None of the three stigma variables were significant in our multivariable analyses of HIV testing intentions.

DISCUSSION

Most Latino MSM (82%) had undergone HIV testing at least once in their lifetime. This lifetime testing prevalence is comparable to those reported in other studies of Latino MSM or MSM of color (76% in Fernandez et al. 2002; 85% in Cohall et al. 2010; 90% in Rendina et al. 2013; 80% in Mitchell and Horvath 2013). Correlates of past HIV testing in our sample included education and self-identification as a homosexual or bisexual/other.

Our finding that higher education was positively associated with HIV testing is similar to previous studies of Latino and other MSM (Cohall et al. 2010, Gilbert and Rhodes 2013, Oster et al. 2014, Mitchell and Horvath 2013, Carballo-Dieguez et al. 2014).

The finding that homosexual or bisexual identify was associated with past HIV testing is also similar to previous studies (Pyun et al. 2014, Myers et al. 1993, Rendina et al. 2014, Carballo-Dieguez et al. 2014, Solorio et al. 2013). A cross-sectional study of black and Latino MSM in LA in 2011 found that bisexual identification was associated with undiagnosed HIV infection in Latino MSM, suggesting a lack of timely HIV testing (Millet at al. 2011). Solorio et al. (2013) also found Latino MSM identifying as homosexual or gay to be more likely to perform HIV testing than those who did not identify as gay.

Sixty percent of our sample indicated high intentions to test for HIV in the next three months. This is higher than a past study of Mexican Latino MSM, which found that only 41% intended to seek HIV testing (Glasman et al. 2010). In our bivariate analyses we found that men who were unmarried, gay-identifying, had a current male sexual partner, had tested for HIV in the past, and who had low internalized HIV-related stigma and low internalized homosexual stigma were more likely to intend to test for HIV in the next three months. However, none of these associations were maintained in our multivariable model. Factors influencing HIV testing intentions have been less studied, but associated factors found by other studies include older age and having previously tested for HIV (Myers et al. 1993, Glasman et al. 2010).

All three types of stigma examined were relatively low in this population. Internalized HIV-related stigma was lowest, with 31 participants having a score of zero, indicating a complete lack of internalized HIV-related stigma. Anticipated HIV-related stigma was highest in our group of MSM, and internalized homosexual stigma fell in between the two. The average internalized homosexual stigma score for our group was lower than previously reported for Latino gay, bisexual, and transgender men (Ramirez-Valles et al. 2010). The average score

found in that study was 2.0 out of a possible four, and the average score in our study was 1.9 out of a possible 10.

Although bivariate analyses of internalized HIV-related stigma and internalized homosexual stigma met our $p>0.25$ criteria for inclusion into our multivariate model, neither type of stigma was independently associated with past HIV testing or intention to test for HIV in the next three months at the $p>0.05$ level. Additionally, none of the three stigma measures were significant in either of the two final multivariable models. Other studies have found various types of stigma to be barriers to HIV testing, in numerous parts of the world and among a variety of MSM populations. A recent study of MSM in China, for example, found internalized homosexual stigma to be a barrier to HIV testing (Pyun et al. 2014). A 2011 systematic review of studies in high-income countries found perceived stigma from the community or other gay men to be a barrier to HIV testing (Lorenc et al. 2011). A 2013 survey conducted in China discovered that recent HIV-testing of MSM was associated with expressing lower levels of internalized HIV-related stigma (or "HIV-related stigmatizing attitudes") (Li et al. 2012). Similarly, a 2011 study of poor and ethnic HIV-positive MSM found that having higher internalized homosexual stigma ("homonegativity") was associated with unrecognized HIV diagnosis, suggesting an association with a lack of timely HIV testing (Young et al. 2011). Future studies with larger sample sizes of Latino MSM of varying sexual self-identification should assess whether internalized HIV-related stigma, anticipated HIV- related stigma, and internalized homosexual stigma are associated with HIV testing history or with intentions to test for HIV.

Another recent study of MSM and transgender women in New York City found that higher anticipated stigma scores were negatively associated with HIV testing behaviors (Golub

and Gamarel 2013). This same study also found that anticipated stigma was negatively associated with risk perception (Golub and Gamarel 2013). One of the most common reasons reported among Latinos and MSM for not undergoing HIV-testing has been low risk-perception (Stall et al. 1996, Lopez-Quintero et al. 2005, Fernandez et al. 2002, Gilbert and Rhodes 2013, Golub and Gamarel 2013). Qualitative work by Solorio et al. (2013) proposed that low-perceived risk may be a result of stigma-deflection, by which male participants who have sex with men and women "asserted their male masculinity and asserted their self-described sexual orientation as not being gay and made statements that 'only gay men get HIV'." If risk perception is in fact related to stigma, stigma may play a larger role in HIV-testing behaviors than our findings suggest.

There are several limitations to this study. First, the small sample size in the present investigation may have limited our power to detect small differences within the group. We also had to collapse several variables into fewer categories due to small cell counts, and in doing so we may have lost some subgroup differences. Future assessments of our longitudinal data will have increased power to detect such differences. Next, as we used self-reported measures, reporting and recall bias are possible. In this study, we did not measure the frequency or last instance of HIV testing. It is probable that individuals having tested multiple times in their lives differ from those having tested only once. It is also possible that some participants indicating low intentions to seek HIV testing in the next three months did so because they were recently tested. Future installments of this prospective study will measure date of last HIV test. Next, due to the cross-sectional nature of this investigation, we were unable to determine any causal relationships between our parameters of study. Future investigations of longitudinal data from our cohort are planned, which will be able to assess whether any study parameters change over

time. Finally, since we recruited some participants from venues serving lesbian, gay, bisexual, and transgender individuals, our participants may not be representative of all immigrant Latino MSM living in the Seattle area. The men who agreed to participate may have been more likely to self-identify as homosexual and more likely to seek HIV testing than the general immigrant Latino MSM population. Generalizability may therefore be limited.

Conclusion

Only higher level of education and self-identifying as homosexual or bisexual/other were significantly associated with increased odds of having ever tested for HIV. None of the three types of stigma were significantly associated with past testing or with intent to test for HIV in the next three months. The findings suggest that Latino MSM most in need of outreach may be less-educated men who do not identify as homosexual or bisexual. Further evaluation of the association between the different types of stigma and HIV testing are warranted for this cohort of men, using the longitudinal data.

APPENDIX

Table 1. Description of participant characteristics, HIV-testing behaviors, and stigma scores

Variable	Total N	N	Mean (SD) or Percent[a]
Age in years	50	---	25 (0.42)
Place of birth	50		
United States		8	16%
Mexico or Other Latin American Country		42	84%
Number of years living in the US	39	---	7.10 (0.83)
≤ 5 years (Arrival in US 2008 or later)		18	46.2%
> 5 years (Arrival in US before 2008)		21	53.8%
Education completed	49		
Less than high school		9	18.4%
High school or above		40	81.6%
Marital/partnership status	50		
Single (never married or previously married)		36	72%
Currently married/partnership		9	18%
Informal partnership/living together		5	10%
Number of sexual partners (last 3 months)	44	---	3.82 (0.62)
Sex of current partner	31		
Male		27	87.1%
Female		4	12.9%
Current employment	48		
Working full-time (35 hours/week or more)		32	66.7%
Working part-time or not working		16	33.3%
Annual income (last year)	26		
$20,000 or less		14	53.9%
$20,001 or above		12	46.2%
Sexual orientation (self-identified)	49		
Heterosexual (“straight”)		5	10.2%
Homosexual (“gay”)		34	69.4%
Bisexual/Other		10	20.4%
Exposure to HIV-testing ads (past 3 months)	43		
No		39	90.7%
Yes		4	9.3%
Tested for HIV (ever)	50		
No		9	18%
Yes		41	82%
Intention to Test for HIV (In the next 3 months)	50	---	6.40 (0.43)
Unlikely to test (Average score < 5.5)		20	40%
Likely to test (Average score ≥ 5.5)		30	60%
Internalized HIV-related stigma (5 questions)	50	---	0.65 (0.16)
No stigma (Average score of 0)		31	62%
Stigma reported (Average score greater than 0)		19	38%
Anticipated HIV-related stigma (6 questions)	50	---	3.15 (0.30)
Low (Average score less than 4)		30	60%
Medium/High (Average score 4 or above)		20	40%
Internalized homosexual stigma (13 questions)	50	---	1.90 (0.28)
Low (Average score less than 4)		39	78%
Medium/High (Average score 4 or above)		11	22%

[a] **Totals may not equal 100% due to rounding**

Table 2. Results, Binary Analyses	Past HIV Testing				Intention to Test for HIV in the Next 3 Months			
Variable	**N**	**Never Tested N (%)[a]**	**Has Tested N (%)[a]**	**OR (95% CI)**	**N**	**Unlikely to Test N (%)[a]**	**Likely to Test N (%)[a]**	**OR (95% CI)**
Age (in years)	50	9 (18%)	41 (82%)	1.04 (0.81, 1.32)	50	20 (40%)	30 (60%)	0.96 (0.79, 1.16)
Place of birth								
United States	8	0 (0%)	8 (100%)	Ref	8	4 (50%)	4 (50%)	Ref
Mexico/Other Latin American Country	42	9 (21.4%)	33 (78.6%)	0.36 (0, 2.66)[b]	42	16 (38.1%)	26 (61.9%)	1.63 (0.36, 7.43)
Number of years living in the US (acculturation)								
≤ 5 years	18	5 (27.8%)	13 (72.2%)	Ref	18	7 (38.9%)	11 (61.1%)	Ref
> 5 years	21	4 (19%)	17 (81%)	1.63 (0.37, 7.33)	21	8 (38.1%)	13 (61.9%)	1.03 (0.28, 3.77)
Education completed								
Less than high school	9	5 (55.6%)	4 (44.4%)	Ref	9	5 (55.6%)	4 (44.4%)	Ref
High school or above	40	4 (10%)	36 (90%)	11.26 (2.11, 59.88)***	40	14 (35%)	26 (65%)	2.32 (0.54, 10.06)
Marital/partnership status								
Single (never married or previously married)	36	6 (16.7%)	30 (83.3%)	Ref	36	11 (30.6%)	25 (69.4%)	Ref
Currently married/ partnership	9	1 (11.1%)	8 (88.9%)	1.60 (0.17, 15.27)	9	5 (55.6%)	4 (44.4%)	0.35 (0.08, 1.57)*
Informal partnership/ living together	5	2 (40%)	3 (60%)	0.30 (0.04, 2.20)*	5	4 (80%)	1 (20%)	0.11 (0.01, 1.10)*
Number of sexual partners (last 3 mo.)	44	17 (38.6%)	27 (61.4%)	0.94 (0.79, 1.12)	44	17 (38.6%)	27 (61.4%)	1.08 (0.91, 1.29)
Sex of current partner								
Male	27	1 (3.7%)	26 (96.3%)	Ref	27	11 (40.7%)	16 (59.3%)	Ref
Female	4	4 (100%)	0 (0%)	0.02 (0, 0.16)[b] ***	4	4 (100%)	0 (0%)	0.15 (0, 1.29)[b] *
Current employment								
Working full-time (35 hours/week or more)	32	7 (21.9%)	25 (78.1%)	Ref	32	12 (37.5%)	20 (62.5%)	Ref
Part-time/not working	16	2 (12.5%)	14 (87.5%)	1.96 (0.36, 10.75)	16	8 (50%)	8 (50%)	0.60 (0.18, 2.02)

Table 2. Continued	Past HIV Testing				Intention to Test for HIV in the Next 3 Months			
Variable	**N**	**Never Tested N (%)***	**Has Tested N (%)***	**OR (95% CI)**	**N**	**Unlikely to Test N (%)***	**Likely to Test N (%)***	**OR (95% CI)**
Annual income (last year)								
$20,000 or less	14	0 (0%)	14 (100%)	Ref	14	3 (21.4%)	11 (78.6%)	Ref
$20,001 or above	12	2 (16.7%)	10 (83.3%)	0.33 (0, 4.47)[b]	12	5 (41.7%)	7 (58.3%)	0.38 (0.07, 2.13)
Sexual Orientation (self-identified)								
Heterosexual (straight)	5	3 (60%)	2 (40%)	Ref	5	4 (80%)	1 (20%)	Ref
Homosexual (gay)	34	3 (8.8%)	31 (91.2%)	15.50 (1.81, 132.54)**	34	10 (29.4%)	24 (70.6%)	9.60 (0.95, 96.92)*
Bisexual/Other	10	2 (20%)	8 (80%)	6.00 (0.56, 63.99)*	10	5 (50%)	5 (50%)	4.00 (0.32, 49.60)
Exposure to HIV-testing ads (past 3 months)								
No	39	7 (17.9%)	32 (82.1%)	Ref	39	14 (35.9%)	25 (64.1%)	Ref
Yes	4	0 (0%)	4 (100%)	1.08 (0.12, Infinity)[b]	4	3 (75%)	1 (25%)	0.19 (0.02, 1.97)*
Tested for HIV (ever)								
No	----	----	----	----	9	8 (88.9%)	1 (11.1%)	Ref
Yes	----	----	----	----	41	12 (29.3%)	29 (70.7%)	19.33 (2.18,171.89)***
Intention to Test for HIV (In the next 3 months)								
Unlikely (Score < 5.5)	20	8 (40%)	12 (60%)	Ref	----	----	----	----
Likely (Score ≥ 5.5)	30	1 (3.3%)	29 (96.7%)	19.33 (2.18, 171.89)***	----	----	----	----
Internalized HIV-related stigma								
No stigma (Average score of 0)	31	4 (12.9%)	27 (87.1%)	Ref	31	10 (32.3%)	21 (67.7%)	Ref
Some stigma (Average score > 0)	19	5 (26.3%)	14 (73.7%)	0.42 (0.10, 1.80)*	19	10 (52.6%)	9 (47.4%)	0.43 (0.13, 1.39)*
Anticipated HIV-related stigma								
Low (Average < 4)	30	4 (13.3%)	26 (86.7%)	Ref	30	9	21	Ref
Medium/High (Average 4 or above)	20	5 (25%)	15 (75%)	0.46 (0.11, 1.99)	20	11	9	0.35 (0.11, 1.14)*
Internalized homosexual stigma								
Low (Average < 4)	39	5 (12.8%)	34 (87.2%)	Ref	39	14 (35.9%)	25 (64.1%)	Ref
Medium/High (Average 4 or above)	11	4 (36.4%)	7 (63.6%)	0.26 (0.06, 1.21)*	11	6 (54.5%)	5 (45.5%)	0.47 (0.12, 1.81)*

[a] Percentages may not add to 100 due to rounding.

[b] In some cases, low cell counts necessitated use of exact logistic regression.

*** p < 0.25 (inclusion criteria for multivariate analyses); ** p < 0.05; *** p < 0.01**

Table 3. Results, Multivariate Analyses	Past HIV Testing			Intention to Test for HIV in the Next 3 Months		
Variable	**aOR**	**(95% CI)**	**p**	**aOR**	**(95% CI)**	**p**
Education completed	73.792	(2.69, 2026.22)	0.011	----	----	----
Marital status						
Single (never married/ previously married)	----	----	----	Ref	----	----
Currently married/partnership	----	----	----	0.28	(0.05, 1.45)	0.129
Informal partnership/living together	----	----	----	0.10	(0.01, 1.34)	0.083
Sexual orientation						
Heterosexual/straight	Ref	----	----	Ref	----	----
Homosexual/gay	60.13	(2.184, 1654.94)	0.015	10.57	(0.85, 132.09)	0.067
Bisexual/other	118.98	(1.64, 8626.93)	0.029	4.03	(0.27, 59.88)	0.311
Internalized HIV-related stigma	0.33	(0.01, 9.12)	0.515	0.52	(0.10, 2.78)	0.440
Anticipated HIV-related stigma	4.66	(0.22, 98.02)	0.322	0.76	(0.15, 3.78)	0.738
Internalized homosexual stigma	0.35	(0.02, 6.64)	0.484	0.84	(0.51, 6.68)	0.852

HIV-Related Stigma Scale (adapted from MacPherson et al. 2011)

- The first five questions were used to evaluate Internalized HIV-Related Stigma.
- The final six questions were used to evaluate Anticipated HIV-Related Stigma.

For the following questions, provide an answer based on the following 10-point scale. You can choose any number from 1 to 10. How much do you agree or disagree with each of the statements.

0 1 2 3 4 5 6 7 8 9 10

Totally Disagree **Totally Agree**

Internalized HIV-related stigma	Answer
People with HIV are immoral.	
People should not share a meal with a person with HIV.	
If a person in a stable relationship goes for HIV testing, he/she must be unfaithful.	
Would you fear getting HIV from hugging a person with HIV or AIDS?	
Would you fear getting HIV from caring for a person with HIV or AIDS?	
Anticipated HIV-related stigma	
From what you have seen in the community, if you were HIV positive and people found out, do you think that your partner would leave you?	
From what you have seen in the community, if you were HIV positive and people found out, do you think that you would be abandoned or not cared for by your family?	
From what you have seen in the community, if you were HIV positive and people found out, do you think that you would be verbally abused?	
From what you have seen in the community, if you were HIV positive and people found out, do you think that you would be fired from work or lose your job?	
From what you have seen in the community, if you were HIV positive and people found out, do you think that you would be sidelined by friends?	
From what you have seen in the community, do you think that you would want others to know if a family member became sick with HIV?**	

**Reverse coding was used for this question, as a higher score indicates lower anticipated stigma.

Internalized Homosexual Stigma Scale (Adapted from Ramirez-Valles et al. 2010 and Visser et al. 2008*)

For the following questions, provide an answer based on the following 10-point scale. You can choose any number from 1 to 10.

0 1 2 3 4 5 6 7 8 9 10

Totally Disagree **Totally Agree**

	Answer
I have tried to stop being attracted to men.	
I would like to get professional help in order to change my sexual orientation.	
Sometimes I wish I could become more sexually attracted to women.	
Sometimes I feel ashamed of my sexual orientation.	
I am afraid my family and friends will find out about my sexual orientation.	
Sometimes I wish I were not gay.	
Sometimes I wish that if I were straight, I would probably be happier.	
If there were a pill to make me straight, I would take it.	
Men who look or act effeminate make me feel uncomfortable.	
It is important for me to look and behave in a masculine way.	
Gay people are promiscuous.	
Gay people are to blame for society's attitudes toward us.	
I think that getting HIV is a punishment for bad behavior.*	

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