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HIV Testing among Latino Emerging Adults: Examining Associations with Familism, Nativity, and Gender

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Abstract

Background: Research examining factors associated with low uptake of HIV testing among Latino emerging adults is scarce. Thus, this study examined the association between familism support and HIV testing among Latino emerging adults, and whether nativity status and gender moderated this association.

Methods: A cross-sectional online survey of 157 Latino emerging adults aged 18–25 years living in Arizona and Florida was conducted and data were analyzed using robust Poisson regression models.

Results: Results indicated that 59.9% of participants had ever been tested for HIV. Higher familism support was associated with a decreased prevalence of having ever been tested for HIV (aPR= .81, 95% CI: .68-.95, $p=.012$). Nativity status moderated the association between familism

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support and HIV testing, with this negative association, only found among immigrants. Gender did not moderate this association.

Discussion: Familism support plays a role in HIV testing behaviors, and thus should be considered when developing and tailoring programs to increase HIV testing among Latinos.

Keywords

HIV testing; familism; Latino/a; emerging adults

Introduction

Latino emerging adults aged 18–24 bear a disproportionate share of the human immunodeficiency virus (HIV) epidemic in the United States (U.S.), representing 23.3% of new HIV diagnoses in this age group [1]. After non-Latino Blacks, Latinos had the second highest rates of new HIV diagnoses among emerging adults in 2016 [1]. In addition, among emerging adults, Latinos are at especially high risk for engaging in unprotected sex and substance use, both increasing their risk of acquiring HIV [2–4].

Latinos in the U.S. have the highest percentage of undiagnosed HIV infections among all racial/ethnic groups (16.5%) and are more likely to test late for HIV infection [5, 6]. In addition, an estimate of 44% of young people aged 13–24 are unaware of their HIV status [7]. These high percentages of undiagnosed HIV infections among Latinos and young people are pertinent to Latino emerging adults as this group has high rates of HIV diagnoses and a lower prevalence of HIV testing [1, 8]. Both female and male Latino emerging adults have a low HIV testing prevalence (males: 26.8%, females: 46.5%) compared to non-Latino Black emerging adults (males: 45.3%, females: 59.9%) [8]. Thus, increasing the uptake of HIV testing among Latino emerging adults is critical to increase the number of people aware of their HIV status and linked to HIV care.

Familism and HIV Testing

Familism is a salient cultural value among Latinos and reflects the importance of family. The behavioral process model of familism (BPMF) proposes that familism reflects a set of beliefs about the behavioral standards of family members that drive familism-consistent behaviors among youth [9]. Latino youth who endorse high levels of familism values are more likely to adjust their behaviors to reflect their family values [9]. As a result, they engage more in prosocial and less in risk behaviors to not compromise their family values and maintain close relationships [9].

Familism has been found to be negatively associated with HIV testing behaviors among Latinos [10, 11]. A recent study on Latino adolescents aged 13–16 found that those who endorsed higher familism values were less likely to have had an HIV test [10]. Another qualitative study among young Latino men who have sex with men (MSMs) found that familism was reported as a barrier to HIV testing due to fear of facing negative attitudes from family towards seeking HIV testing [11].

While previous studies have examined the role of familism on HIV testing among young Latinos, none has examined specific components of familism (e.g., familism support) as separate determinants of HIV testing behaviors in this population. One important component of familism is the perception of the family as the primary source of social support [12]. This perception of family support is high among Latinos [13]. Latinos believe that issues can be solved with the help of family members and that support can always be found within familial networks more than from external networks [12]. This sense of family support and close relationships emphasized by familism may be protective for health and health behaviors [14–16]. However, in some instances such as when the behavior is stigmatized (e.g., HIV testing), people may feel hesitant to seek support from familial networks [17, 18].

Recent studies have demonstrated the protective effect of social support on HIV testing behaviors [19–21]. However, the influence of social support on HIV testing may differ by the source of support [21, 22]. For instance, seeking family support to getting tested for HIV may be ineffective as this behavior may be seemed negatively by family members. Among Latinos, HIV testing is highly stigmatized and is equated with sexual promiscuity and homosexuality [11]. Also, the act of getting tested for HIV may suggest that a person is infected with HIV. Thus, having to disclose one's sexual activity, sexual orientation, and potential HIV status when seeking support from family to getting tested for HIV may bring familial conflict [10]. As a result, Latinos may decide not to seek support from family to getting tested for HIV. Thus, understanding the influence of familism support on HIV testing behaviors among Latinos is important.

Nativity, Gender, and Familism

Familism support may differ by nativity status and gender among Latinos. Foreign-born Latinos tend to have higher levels of familism support compared to their U.S. born counterparts [13]. These higher levels of familism support among foreign-born Latinos may be due to higher retention of cultural values and stronger orientation towards the family network as they adjust to their new environment [13]. Furthermore, familism values are socialized and encouraged more for females than for males in the Latino culture [23]. Consequently, females have closer relationships with their families and are urged to meet family expectations for gender roles [9, 23]. Considering this information, it would be important to examine whether the association between familism support and lifetime history of HIV testing is moderated by nativity status and gender.

Present Study

The objective of this study was to examine the association between familism support and HIV testing behaviors among Latino emerging adults. Emerging adulthood is a distinct developmental stage characterized by greater autonomy in decision making and independence from the family network [24]. As emerging adults become more independent and autonomous, they may adhere less to familism values and seek less support from familial networks [9]. This, in turn, may modify the extent to which emerging adults' behaviors reflect their adherence to familism values. Therefore, it is particularly important to examine whether familism support acts as a barrier to HIV testing behaviors among Latinos during emerging adulthood.

Accordingly, the primary aims of this study were to (1) examine the association between familism support and HIV testing, and (2) examine the extent to which nativity status and gender moderate the association between familism support and HIV testing among Latino emerging adults. We hypothesize that (1) higher levels of familism support would be negatively associated with lifetime history of HIV testing and (2) the association between familism support and lifetime history of HIV testing would be moderated by nativity status and gender in such a way that the association would be stronger for immigrants than U.S. born, and for females than males.

Methods

Participants and Data Collection

The present study used cross-sectional data from the *Project on Health among Emerging Adult Latinos* (Project HEAL). Project HEAL was designed to examine psychological, social and cultural influences on alcohol and nicotine use behaviors, mental health, sexual behaviors among Latino emerging adults. A convenience sample of 200 participants was obtained using quota sampling to ensure a proportional distribution of gender and college student status. Participants were 1) Latino/Hispanic, 2) between 18 to 25 years of age, 3) currently living in Maricopa County, Arizona or Miami-Dade County, Florida, and 4) able to read English.

Participants were enrolled from August 2018 to February 2019 to complete a confidential online survey administered via Qualtrics. Recruitment methods included online platforms (i.e. Facebook), listservs, flyers, and word-of-mouth. Also, most non-college participants at each study site were recruited in-person by research personnel from the FIU Center for Research on U.S. Latino HIV/AIDS and Drug Abuse (CRUSADA) and the Arizona State University Southwest Interdisciplinary Research. Prospective participants interested in the study contacted a member of Project HEAL by email and were screened to determine their eligibility to enroll in the study. with experience in recruiting Latino participants for research studies. All eligible participants were emailed a unique Internet link to complete the online survey. Informed consent was provided by participants prior to completing the survey using an electronic informed consent form. Participants were informed that all their responses were voluntary and confidential, and that they could stop completing the survey at any time and refuse to answer any questions that might make them feel uncomfortable. Also, participants were advised to complete the survey in a private place to prevent loss of confidentiality. The online survey took approximately 50 minutes to be completed and participants received a \$30 Amazon e-gift card as an incentive. The study was approved by the Institutional Review Board of Florida International University.

Measures

Lifetime history of HIV testing was assessed using the following question “Have you ever been tested for HIV, the virus that causes AIDS? (Do not count tests done if you donated blood) [25]. Responses included 1=*yes* and 0=*no*.

Familism support was measured using the six-item *familism support* sub-scale of the Mexican American Cultural Values Scale (MACVS) [26], which includes statements such as “family provides a sense of security because they will always be there for you.” Responses were rated on a 5-point scale ranging from *not at all* (1) to *completely* (5). Items were averaged with higher scores indicating stronger familism support. Cronbach’s reliability coefficient for this measure was $\alpha = .91$. This measure has been used in previous studies with Mexican and non-Mexican samples and has demonstrated adequate reliability [26, 27].

Covariates

HIV stigma was measured using the three-item stigma sub-scale *concerns with public attitudes* developed by Reinius et al., 2017 [28]. Items were rated on a 4-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (4). Items were summed with higher scores indicating a higher level of HIV-related stigma ($\alpha=.85$). This variable was included in this study because HIV stigma within the family context has been found to influence HIV testing behaviors among Latinos [11].

Number of sexual partners was assessed with the item “In the past 3 months, with how many people did you have sexual intercourse (this includes vaginal and/or anal sex)?”. Responses included 1=*I have never had sexual intercourse*, 2=*I have had sexual intercourse, but not during the past 3 months*, 3=*1 person*, 4=*2 people*, 5=*3 people*, 6=*4 people*, 7=*5 people*, 8=*6 or more people* [25]. Responses were categorized as 1=*no recent sexual partners*, 2=*1 or 2 sexual partners*, and 3=*3 or more sexual partners*.

Unprotected sex was assessed using the following two questions: “In the past 3 months, did you use a condom every time you had vaginal and/or anal sex with your primary partner (someone with whom you feel the most committed such as boyfriend/girlfriend, spouse, significant other, or life partner)?” and “In the past 3 months, did you use a condom every time you had vaginal and/or anal sex with a casual partner (someone with whom you do not feel committed to or know very well)?”. Participants were classified as having unprotected sex in the past 3 months (coded as 1=*yes* and 0=*no*) if they responded “no” to any of these questions.

Sociodemographic variables included age, gender (0=*male*, 1=*female*), partner status (0=*single*, 1=*has a partner*), sexual or gender minority status (0=*heterosexual*, 1=*sexual or gender minority (gay, lesbian, bisexual, transgender or other)*), nativity status (0=*immigrant*, 1=*U.S. born*), Latino subethnicity (0=*Mexican*, 1=*Cuban*, 2=*Colombian*, 3=*non-Colombian South American*, 4=*Central American*, 5=*other Latino*), college student status (0=*no*, 1=*yes*), education level (0=*no bachelor’s degree*, 1=*completed bachelor’s degree or higher*), employment status (0=*unemployed*, 1=*employed*), financial strain (1=*has more money than needed*, 2=*just enough money for needs*, 3=*not enough money to meet needs*), health insurance (0=*not insured*, 1=*insured*), and study site (0=*Maricopa County, Arizona*, 1=*Miami-Dade County, Florida*).

Analysis

Descriptive analyses were conducted for each independent variable by lifetime history of HIV testing. Frequencies and proportions were reported for categorical variables and means

and standard deviations for continuous variables. Poisson regression models with robust estimates of variance were used to estimate unadjusted and adjusted prevalence ratios (aPRs) and 95% confidence intervals (CIs) for lifetime history of HIV testing [29, 30], instead of log-binomial regression model due to lack of convergence. We used prevalence ratios instead of odds ratios because the prevalence of lifetime history of HIV testing was high (>10%), and odds ratios tend to overestimate the strength of association when the outcome is common [30]. Bivariate analyses were first conducted and independent variables with a significance level of <0.10 were included as covariates in the robust Poisson regression model. Sexual risk behaviors and HIV stigma are linked with HIV testing [31, 32]; thus, these variables were also included in the final model to reduce potential confounding effects. Two interaction terms (familism $\times$ nativity status; familism $\times$ gender) were added to the model and stratified models were estimated for interaction terms that were statistically significant. All data analyses were performed using SPSS V.25 and a statistical significance of <0.05 was used.

The final sample used for statistical analyses was 157 participants. A total of 43 participants were excluded because they either had not initiated sexual debut (41) or had a missing value on the questions about having had sexual intercourse or lifetime history of HIV testing (2). A post hoc power analysis was conducted using the software program G*Power (version 3.1.9.4) [33]. With a sample of 157, we can detect an effect size as small as 0.45 at 0.05 alpha level with 80% power [33].

Results

Descriptive Characteristics

The average age was 21.5 years ($SD=2.04$) and approximately half of the sample were females ($n=81$, 51.6%) (Table 1). The majority of participants were college students ($n=104$, 66.2%) and born in the U.S. ($n=108$, 68.8%). Most participants identified as Mexican ($n=75$, 47.8%), Cuban ($n=22$, 14.0%), Colombian ($n=19$, 12.1%), non-Colombian South American ($n=17$, 10.8%), and Central American ($n=13$, 8.3%). Participants were currently living in Maricopa County, Arizona ($n=83$, 52.9%) and Miami Dade County, Florida ($n=74$, 47.1%). Of those living in Arizona, 88.0% ($n=73$) were of Mexican heritage whereas of those living in Florida 97.3% ($n=72$) were of non-Mexican heritage. Most participants identified as heterosexual ($n=132$, 84.1%) and reported having had 1 or 2 sexual partners in the past 3 months ($n=106$, 67.5%). About half of the participants reported having had unprotected sex in the past 3 months ($n=77$, 49.0%) and 59.9% ($n=94$) reported having ever been tested for HIV. Descriptive characteristics by lifetime history of HIV testing are found in Table 1.

Bivariate Analyses

Independent variables associated with lifetime history of HIV testing in the bivariate analyses were gender, partner status, sexual or gender minority status, Latino subethnicity, education level, study site, unprotected sex in the past 3 months, age, and familism support (p -value <0.10; Table 2).

Robust Poisson Regression

Only three predictor variables were statistically significant in the robust Poisson regression model: gender, sexual or gender minority status and familism support (Table 2). Females had an increased prevalence of having ever been tested for HIV as compared to males (aPR=1.45, 95% CI: 1.09–1.95, $p=.012$). Sexual or gender minority people had an increased prevalence of having ever been tested for HIV as compared to heterosexual people (aPR=1.53, 95% CI: 1.10–2.13, $p=.012$). Also, a one-unit *increase* in familism support was associated with a .19 decrease in the prevalence of having ever been tested for HIV (aPR= .81, 95% CI: .68-.95, $p=.012$).

Moderation Analyses

The interaction term between familism support and nativity status was statistically significant ($p=.004$; Figure 1) but not the term between familism support and gender ($p=.983$). Stratified models were fitted to examine the association between familism support and lifetime history of HIV testing by nativity status. In the stratified model for immigrants, familism support was negatively associated with lifetime history of HIV testing. A one-unit increase in familism support was associated with a .54 decrease in the prevalence of having ever been tested for HIV (aPR=.46, 95% CI: .28-.74, $p=.002$). For U.S. born, familism support was not significantly associated with lifetime history of HIV testing (aPR=.93, 95% CI: .76–1.13, $p=.455$).

Discussion

Key findings of the present study are as follow. Our data supported the hypothesis that higher levels of familism support would be negatively associated with lifetime history of HIV testing. Our data also supported the hypothesis that the association between familism support and lifetime history of HIV testing would be moderated by nativity status. However, our data did not support the hypothesis of gender as a moderator.

Our finding regarding the negative association between familism support and lifetime history of HIV testing is consistent with a previous study that found this association among Latino adolescents [10]. One potential explanation for this finding is that Latino emerging adults with higher familism support are more likely to seek support from family networks, however, since testing for HIV is seen as a negative behavior they may feel hesitant to seeking support from family members to getting tested for HIV [34]. Additionally, exposing one's sexual behaviors may disrupt supportive relationships and bring conflict, and this, in turn may discourage seeking family support to getting tested for HIV [14]. This finding is in line with previous studies showing that Latinos may encounter barriers to receiving social support from their ethnic and family networks due to negative responses towards stigmatized behaviors (e.g., same-sex sexual behaviors) [14, 35].

Receiving social support facilitates HIV testing and the utilization of prevention services [36, 37]. Social support serves as a buffer against barriers to HIV testing and provides help to coping with negative psychological responses (e.g., fear, anxiety) to getting tested or finding out an HIV positive status [20]. Since family support is the main source of social

support among Latinos [13], addressing familism support as a barrier to HIV testing is crucial. In fact, a previous study among Latinas showed the importance of familial support for seeking testing for HIV as many health decisions are made within the family context [38]. Thus, familism support may be a potential source of support that can be utilized to promote HIV testing in this population.

As previously mentioned, emerging adults may adhere less to familism and seek less support from familial networks and thus their health behaviors and decisions may reflect lower familism values [9]. However, it seems that for Latinos emerging adults, familism continues to have an influence on sexual health decisions during this developmental stage. Therefore, deterring HIV testing due to the endorsement of familism may increase the risk for negative sexual health outcomes in later adult years. Addressing familism as a barrier to HIV testing during emerging adulthood is important as during this stage individuals establish long-term behavioral patterns [39].

Findings from the moderation analysis indicated that the association between familism support and HIV testing was specific to immigrants. An explanation underlying this finding is that foreign-born Latinos are more likely to adhere to familism values as compared to U.S. born Latinos, which reduces their likelihood of seeking family support for HIV testing [13, 14]. Foreign-born Latinos that immigrate to the U.S. tend to rely more on family support networks than their U.S. born counterparts as a way of coping with the new challenges and lack of resources [13]. This may not be crucial for U.S. born Latinos because they are more likely to utilize their extended social networks that may provide support for seeking HIV testing. Future studies should investigate the structure of social and familial networks that Latinos engage with and whether they exist post-immigration, and the support and communication dynamics related to HIV testing within these networks, to understand how to effectively use them to promote HIV testing [34, 40]. It might also be important to examine how the effect of familism support on HIV testing among immigrants may differ by time living in the U.S., country of origin, and family socioeconomic status.

Unlike nativity status, gender did not moderate the association between familism support and HIV testing. The majority of the sample was U.S. born and thus more acculturated to the U.S. norms surrounding familism and HIV testing. Therefore, females in this study may be more acculturated and more likely to discard familism norms and seek support for HIV testing from social networks other than the family [9]. For Latino males, familism norms are less socialized and acculturation may not have the same effect on changing these norms as for females [9]. Furthermore, it could also be that females in this study may have had more contact with routine HIV testing in healthcare settings, making testing more of a health care provider's recommendation than a proactive personal decision, and thus familism support may not have been as important in the decision to test for HIV. The majority of the sample were college students (66.2%), and college student females tend to have higher utilization of healthcare services than college student males [41]. Thus, more contact with healthcare services among college student females provide them with more opportunities to be offered an HIV test by a healthcare provider. This may explain why the association between familism support and HIV testing did not differ for females and males.

Furthermore, we also found that gender and sexual or gender minority status were associated with lifetime history of HIV testing. Females had an increased prevalence of having ever been tested for HIV as compared to males. This finding is consistent with prior research among emerging adults [41]. A potential explanation is that females may have more opportunities to be tested for HIV than males, as they receive HIV testing during routine gynecological and prenatal screenings as recommended by the Centers for Disease Control and Prevention (CDC) [42]. Considering that Latino males accounted for 22% of new HIV diagnoses in 2017, this finding points to the importance of continued outreach efforts to increase uptake of HIV testing among young Latino males [43]. However, both Latino females and males have significant barriers to HIV testing including limited access to health care and preventive services and insufficient effective prevention strategies [44, 45]. In this study, only 59.9% of participants reported having ever been tested for HIV. Thus, addressing both traditional and cultural barriers to HIV testing may help increase HIV testing uptake among young Latino females and males.

Similar to previous studies, sexual or gender minority people had an increased prevalence of having ever been tested for HIV than heterosexuals [46]. This finding may be partly explained by higher levels of concern about sexual history among sexual or gender minorities groups and may reflect targeted efforts to increase HIV testing among sexual or gender minorities [46].

The findings of this study underscore the importance of developing and evaluating health communication messages that target Latino emerging adults and their families (particularly immigrants) to promote and normalize HIV testing within families. Since seeking HIV testing may be associated with sexual promiscuity and homosexuality within Latino family networks [11], it is important to develop and evaluate health communication messages that can be used to eliminate these misconceptions. Health messages that promote the importance of HIV testing for all people irrespective of risk factors for HIV infection (as recommended by the CDC), health benefits of getting tested for the individual and family, and seeking social support from a trusted friend (not only from the family) may help to reduce the impact of familism values on HIV testing behaviors among Latino emerging adults [47, 48].

Current HIV awareness campaigns targeting Latinos such as Doing It, Start Talking. Stop HIV., and Stop HIV Stigma [49], may be enhanced by including health communication messages that specifically target Latino families to encourage talking about HIV testing and testing together as a family. This may help to change stigmatizing family dynamics, raise awareness and encourage communication about HIV testing, and enhance supportive relationships among family members with respect to seeking testing for HIV. For instance, an HIV prevention and testing program (*Protege tu Familia: Hazte la Prueba*) targeting Latino families through the delivery of guided conversations on HIV prevention by community health workers was effective in increasing discussion about sexual risk, reducing HIV stigma and increasing HIV testing intentions among families [50].

Limitations

There are several limitations to this study. First, self-reported measures were used to collect data on behaviors, and thus susceptible to recall and social desirability biases. To reduce the

potential of recall bias for some measures, participants were asked behavioral events for the past 3 months. Second, the generalizability of these findings may be limited as a non-probability sampling was used and most participants were U.S. born Latinos and college students. Also, the survey was only offered in English which may have excluded potential Spanish monolingual or low-English proficiency participants. In addition, the online survey methodology may have excluded individuals without access to internet-based devices. However, nearly all young Latinos aged 18 to 29 (94%) have access to the internet [51]. Replicating this study with a more diverse and representative sample of young Latinos is warranted. Third, HIV testing was measured as lifetime history, and thus testing could have occurred before immigrant participants came to the U.S. Fourth, this study relies on current reports of familism support to predict past behavior of HIV testing. Measuring familism support at the time of testing for HIV may provide a better understanding of the role of familism on HIV testing behaviors. Nonetheless, familism values remain highly important for Latinos throughout their lifetime [52]. Lastly, only familism support was examined as a determinant of HIV testing in this study. Therefore, other components of familism should be examined in future studies (e.g., Familism Obligations, Familism Referents).

New Contribution to the Literature

This is the first study to examine the association between familism support and lifetime history of HIV testing among Latino emerging adults. This study advances our understanding of cultural influences on HIV testing behaviors among Latino emerging adults, a group with one of the highest risks of HIV in the U.S. Taken together with national priorities to address HIV disparities among Latinos and young adults, these findings suggest the critical need to develop strategies for increasing and promoting HIV testing for this group that incorporate cultural values of Latino families.

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References

1. Centers for Disease Control and Prevention (CDC): Diagnoses of HIV infection among adolescents and young adults in the United States and 6 dependent areas, 2011–2016. HIV Surveillance Supplemental Report. 2018;23(3):1–45.
2. Deardorff J, Tschann JM, Flores E, de Groat CL, Steinberg JR, Ozer EJ: Latino youths' sexual values and condom negotiation strategies. *Perspect Sex Reprod Health*. 2013;45(4):182–190. [PubMed: 24165307]
3. Copen CE: Condom Use During Sexual Intercourse Among Women and Men Aged 15–44 in the United States: 2011–2015 National Survey of Family Growth. *Natl Health Stat Report*. 2017;105:1–18.
4. Stone AL, Becker LG, Huber AM, Catalano RF: Review of risk and protective factors of substance use and problem use in emerging adulthood. *Addict Behav*. 2012;37(7):747–775. [PubMed: 22445418]

5. CDC: Estimated HIV incidence and prevalence in the United States 2010–2015. HIV Surveillance Supplemental Report 2018. 2018;23(No.1):1–77.
6. Dennis AM, Napravnik S, Seña AC, Eron JJ: Late entry to HIV care among Latinos compared with non-Latinos in a southeastern US cohort. *Clin Infect Dis*. 2011;53(5):480–487. [PubMed: 21844031]
7. CDC: HIV and Youth. <https://www.cdc.gov/hiv/pdf/group/age/youth/cdc-hiv-youth.pdf>. Accessed April 29, 2019.
8. Van Handel M, Kann L, O'Malley Olsen E, Dietz P: HIV testing among US high school students and young adults. *Pediatrics*. 2016;137(2):e20152700. [PubMed: 26787047]
9. Hernández MM, Bámaca-Colbert MY: A behavioral process model of familism. *J Fam Theory Rev*. 2016;8(4):463–483. [PubMed: 28496520]
10. Ma M, Malcolm LR: Cultural influences on HIV testing among Latino youth. *Cult Health Sex*. 2016;18(4):470–480. [PubMed: 26430735]
11. Solorio R, Forehand M, Simoni J: Attitudes towards and beliefs about HIV testing among Latino immigrant MSM: a comparison of testers and nontesters. *AIDS Res Treat*. 2013;2013:1–10.
12. Sabogal F, Marín G, Otero-Sabogal R, Marín BV, Perez-Stable EJ: Hispanic familism and acculturation: What changes and what doesn't? *Hispanic Journal of Behavioral Sciences*. 1987;9(4):397–412.
13. Almeida J, Molnar BE, Kawachi I, Subramanian SV: Ethnicity and nativity status as determinants of perceived social support: testing the concept of familism. *Soc Sci Med*. 2009;68(10):1852–1858. [PubMed: 19303184]
14. Perez GK, Cruess D: The impact of familism on physical and mental health among Hispanics in the United States. *Health Psychol Rev*. 2014;8(1):95–127. [PubMed: 25053010]
15. Alegría M, Sribney W, Mulvaney-Day NE: Social cohesion, social support, and health among Latinos in the United States. *Soc Sci Med*. 2007;64(2):477–495. [PubMed: 17049701]
16. Diaz CJ, Niño M: Familism and the Hispanic Health Advantage: The Role of Immigrant Status. *J Health Soc Behav*. 2019;60(3):274–290. [PubMed: 31526018]
17. Castro R, Orozco E, Aggleton P, Eroza E, Hernandez JJ: Family responses to HIV/AIDS in Mexico. *Soc Sci Med*. 1998;47(10):1473–1484. [PubMed: 9823043]
18. Rivera-Díaz M, Varas-Díaz N, Padilla M, Vargas-Cancel M, Serrano N: Family interaction and social stigmatization of people living with HIV and AIDS in Puerto Rico. *Glob Soc Work*. 2017;7(13):3–26. [PubMed: 29355248]
19. Grosso A: Social support as a predictor of HIV testing in at-risk populations: a research note. *J Health Hum Serv Adm*. 2010;33(1):53–62. [PubMed: 20568584]
20. Scott HM, Pollak L, Rebchook GM, Huebner DM, Peterson J, Kegeles SM: Peer social support is associated with recent HIV testing among young black men who have sex with men. *AIDS Behav*. 2014;18(5):913–920. [PubMed: 24065436]
21. Painter TM, Song EY, Mullins MM, Mann-Jackson L, Alonzo J, Reboussin BA, Rhodes SD: Social Support and Other Factors Associated with HIV Testing by Hispanic/Latino Gay, Bisexual, and Other Men Who Have Sex with Men in the U.S. South. *AIDS Behav*. 2019;23(Suppl 3):251–265. [PubMed: 31102108]
22. Moodley A, Kagee A: Experiences of social support among persons seeking HIV testing. *J Health Psychol*. 2019;24(6):777–786. [PubMed: 29250998]
23. Guilamo-Ramos V, Bouris A, Jaccard J, Lesesne C, Ballan M: Familial and cultural influences on sexual risk behaviors among Mexican, Puerto Rican, and Dominican youth. *AIDS Educ Prev*. 2009;21(5 Suppl):61–79. [PubMed: 19824835]
24. Fuligni AJ, Pedersen S: Family Obligation and the Transition to Young Adulthood. *Dev Psychol*. 2002;38(5):856–868. [PubMed: 12220060]
25. CDC: 2017 National Youth Risk Behavior Survey. https://www.cdc.gov/healthyyouth/data/yrbs/pdf/2017/2017_yrbs_national_hs_questionnaire.pdf. Accessed June 27, 2018.
26. Knight GP, Gonzales NA, Saenz DS, Bonds DD, German M, Deardoff J, Roosav MW, Updegraff KA: The Mexican American cultural values scale for adolescents and adults. *J Early Adolesc*. 2010;30(3):444–481. [PubMed: 20644653]

27. Villalobos M, Smetana JG: Puerto Rican adolescents' disclosure and lying to parents about peer and risky activities: Associations with teens' perceptions of Latino values. *J Adolesc.* 2012;35(4):875–885. [PubMed: 22209555]
28. Reinius M, Wettergren L, Wiklander M, Svedhem V, Ekström AM, Eriksson LE: Development of a 12-item short version of the HIV stigma scale. *Health Qual Life Outcomes.* 2017;15(1):115. [PubMed: 28558805]
29. Deddens J, Petersen M: Approaches for estimating prevalence ratios. *Occup Environ Med.* 2008;65(7):501–506.
30. Petersen MR, Deddens JA: A comparison of two methods for estimating prevalence ratios. *BMC Med Res Methodol.* 2008;8(1):1–9. [PubMed: 18215293]
31. Adebayo OW, Gonzalez-Guarda RM: Factors associated with HIV testing in youth in the United States: an integrative review. *J Assoc Nurses AIDS Care.* 2017;28(3):342–362. [PubMed: 27993497]
32. Young SD, Zhu Y: Behavioral evidence of HIV testing stigma. *AIDS Behav.* 2012;16(3):736–740. [PubMed: 21800181]
33. Faul F, Erdfelder E, Lang AG, Buchner A: G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav Res Methods.* 2007;39(2):175–191. [PubMed: 17695343]
34. Barrington C, Gandhi A, Gill A, Villa Torres L, Brietzke MP, Hightow-Weidman L: Social networks, migration, and HIV testing among Latinos in a new immigrant destination: Insights from a qualitative study. *Glob Public Health.* 2018;13(10):1507–1519. [PubMed: 29199546]
35. Rhodes SD, Hergenrather KC, Vissman AT, Stowers J, Davis AB, Hannah A, Alonzo J Marsiglia FF: Boys must be men, and men must have sex with women: a qualitative CBPR study to explore sexual risk among African American, Latino, and White gay men and MSM. *Am J Mens Health.* 2011;5(2):140–151. [PubMed: 20413391]
36. Rouhani SA, O'Laughlin KN, Faustin ZM, Tsai AC, Kasozi J, Ware NC: The role of social support on HIV testing and treatment adherence: A qualitative study of HIV-infected refugees in southwestern Uganda. *Glob Public Health.* 2017;12(8):1051–1064. [PubMed: 26783835]
37. Lauby JL, Marks G, Bingham T, Liu K, Liao A, Stueve A, Millett GA: Having supportive social relationships is associated with reduced risk of unrecognized HIV infection among black and Latino men who have sex with men. *AIDS Behav.* 2012;16(3):508–515. [PubMed: 21805191]
38. Sudha S, Morrison SD, Gruber KJ: “Beneficioso y Una Prioridad”: Latina Women's Perceptions about HIV Testing. *Am J Health Behav.* 2017;41(1):3–15. [PubMed: 27935786]
39. Nelson MC, Story M, Larson NI, Neumark-Sztainer D, Lytle LA: Emerging adulthood and college-aged youth: an overlooked age for weight-related behavior change. *Obesity.* 2008;16(10):2205–2211. [PubMed: 18719665]
40. Painter TM: Social Support Networks: An Underutilized Resource for the Prevention of HIV and other Sexually Transmitted Diseases among Hispanic/Latino Migrants and Immigrants. *J Health Care Poor Underserved.* 2018;29(1):44–57. [PubMed: 29503286]
41. Caldeira KM, et al., HIV testing in recent college students: Prevalence and correlates. *AIDS Educ Prev.* 2012;24(4):363–376. [PubMed: 22827905]
42. CDC: HIV and Pregnant Women, Infants, and Children. <https://www.cdc.gov/hiv/pdf/group/gender/pregnantwomen/cdc-hiv-pregnant-women.pdf>. Accessed January 7, 2020.
43. CDC: HIV and Hispanics/Latinos. <https://www.cdc.gov/hiv/pdf/group/raciaethnic/hispaniclatinos/cdc-hiv-latinos.pdf>. Accessed January 7, 2020.
44. Rao S, Seth P, Walker T, Wang G, Mulatu MS, Gilford J, German EJ: HIV testing and outcomes among hispanics/latinos—United States, Puerto Rico, and US Virgin Islands, 2014. *MMWR Morb Mortal Wkly Rep.* 2016;65(40):1099–1103. [PubMed: 27736833]
45. Taveras J, Treпка MJ, Madhivanan P, Gollub EL, Devieux J, Ibrahimou B: HIV Testing Behaviors Among Latina Women Tested for HIV in Florida, 2012. *Hispanic Health Care International.* 2017;15(1):27–34. [PubMed: 28558511]
46. Alang S, Bornstein S: HIV testing history among young adults: The roles of sex, race, and sexual orientation. *Journal of HIV/AIDS & Social Services.* 2018;17(3):180–194.

47. Solorio R, Norton-Shelpuk P, Forehand M, Martinez M, Aguirre J: HIV prevention messages targeting young Latino immigrant MSM. *AIDS Res Treat*. 2014;2014:353092. [PubMed: 24864201]
48. Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, Clark JE: Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *Morbidity and Mortality Weekly Report: Recommendations and Reports*. 2006;55(RR14):1–17.
49. CDC: HIV Prevention for Hispanic / Latino Gay and Bisexual Men. <https://www.cdc.gov/hiv/pdf/policies/cdc-hiv-hispanic-latino-issue-brief.pdf>. Accessed January 7, 2020.
50. Rios-Ellis B, Espinoza L, Bird M, Garcia M, D’Anna LH, Bellamy L, Scolari R: Increasing HIV-related knowledge, communication, and testing intentions among Latinos: Protege tu Familia: Hazte la Prueba. *J Health Care Poor Underserved*. 2010;21(3):148–168. [PubMed: 20675952]
51. Pew Research Center: Hispanics and mobile access to the internet. <https://www.pewresearch.org/hispanic/2016/07/20/3-hispanics-and-mobile-access-to-the-internet/>. Accessed January 7, 2020.
52. Dillon FR, De La Rosa M, Sastre F, Ibañez G: Alcohol misuse among recent Latino immigrants: the protective role of preimmigration familismo. *Psychol Addict Behav*. 2013;27(4):956–965. [PubMed: 23276317]

Figure 1.
Moderation of the association of familism support and lifetime history of HIV testing at levels of nativity status.

Table 1.

Characteristics of sexually active Latino emerging adults by lifetime history of HIV testing (n=157).

		Lifetime History of HIV Testing	
	Total (N=157)	Yes (N=94, 59.9%)	No (N=63, 40.1%)
Characteristic	n(%)	n (%)	n(%)
Gender			
Male	76 (48.4)	39 (51.3)	37 (48.7)
Female	81 (51.6)	55 (67.9)	26 (32.1)
Partner Status			
Single	102 (65.0)	55 (53.9)	47 (46.1)
Has partner	55 (35.0)	39 (70.9)	16(29.1)
Sexual or Gender Minority Status			
Heterosexual	132 (84.1)	75 (56.8)	57 (43.2)
Sexual or gender minority	25 (15.9)	19 (76.0)	6 (24.0)
Nativity Status			
Immigrant	49 (31.2)	25 (51.0)	24 (49.0)
U.S. bom	108 (68.8)	69 (63.9)	39 (36.1)
Latino Subethnicity			
Mexican	75 (47.8)	51 (68.0)	24 (32.0)
Cuban	22 (14.0)	7 (31.8)	15 (68.2)
Colombian	19 (12.1)	12 (63.2)	7 (36.8)
Non-Colombian South American	17 (10.8)	10 (58.8)	7 (41.2)
Central American	13 (8.3)	6 (46.2)	7 (53.8)
Other Latino	11 (7.0)	8 (72.7)	3 (27.3)
College Student			
Yes	104 (66.2)	65 (62.5)	39 (37.5)
No	53 (33.8)	29 (54.7)	24 (45.3)
Education Level			
No bachelor's degree	116 (73.9)	61 (52.6)	55 (47.4)
Completed bachelor's degree or higher	41 (26.1)	33 (80.5)	8 (19.5)
Employment Status			
Employed	131 (83.4)	79 (60.3)	52 (39.7)
Unemployed	26 (16.6)	15 (57.7)	11 (42.3)
Financial Strain			
More money than needed	10 (6.4)	5 (50.0)	5 (50.0)
Just enough money for needs	88 (56.1)	49 (55.7)	39 (44.3)
Not enough money to meet needs	59 (37.6)	40 (67.8)	19 (32.2)
Health Insurance			
Yes	127 (80.9)	77 (60.6)	50 (39.4)

		Lifetime History of HIV Testing	
	Total (N=157)	Yes (N=94, 59.9%)	No (N=63, 40.1%)
Characteristic	n(%)	n (%)	n(%)
No	30 (19.1)	17 (56.7)	13 (43.3)
Study Site			
Miami-Dade County, Florida	74 (47.1)	38 (51.4)	36 (48.6)
Maricopa County, Arizona	83 (52.9)	56 (67.5)	27 (32.5)
Number of Sexual Partners in the Past 3 Months^a			
No recent sexual partners	21 (13.4)	12 (57.1)	9 (42.9)
1 or 2 sexual partners	106 (67.5)	67 (63.2)	39 (36.8)
3 or more sexual partners	27 (17.2)	15 (55.6)	12 (44.4)
Unprotected Sex in the Past 3 Months^a			
Yes	77 (49.0)	54 (70.1)	23 (29.9)
No	76 (48.4)	38 (50.0)	38 (50.0)
	M(SD)	M(SD)	M(SD)
Age	21.5 (2.04)	21.9 (1.92)	21.0 (2.13)
HIV Stigma	9.07 (1.88)	9.02 (1.98)	9.14 (1.75)
Familism Support	4.32 (0.67)	4.23 (0.67)	4.45 (0.66)

^a May not sum up to n=157 due to missing data.

Table 2.

Robust Poisson Regression Model Predicting Lifetime History of HIV Testing (n=151)

Variable	Model 1				Model 2			
	<i>B</i>	<i>SE</i>	<i>Unadjusted PR</i>	<i>95% CI</i>	<i>B</i>	<i>SE</i>	<i>Adjusted PR (aPR)</i>	<i>95% CI</i>
Gender (Ref: Male)								
Female	.28	.14	1.32	1.02, 1.73 *	.37	.15	1.45	1.09, 1.95 **
Partner Status (Ref: Single)								
Has a partner	.27	.13	1.32	1.03, 1.68 *	.07	.14	1.07	.82, 1.41
Sexual or Gender Minority (Ref: Heterosexual)								
Sexual or gender minority	.29	.14	1.34	1.03, 1.75 *	.43	.17	1.53	1.10, 2.13 **
Nativity Status (Ref: Immigrant) ^a								
U.S. born	.23	.16	1.25	.92, 1.71	.07	.16	1.07	.79, 1.46
Latino Subethnicity (Ref: Mexican)								
Cuban	-.76	.32	.47	.25, .90 *	-.64	.42	.53	.24, 1.20
Colombian	-.07	.19	.93	.64, 1.35	.25	.32	1.29	.69, 2.42
Non-Colombian South American	-.15	.22	.87	.56, 1.33	.11	.37	1.11	.54, 2.32
Central American	-.39	.31	.68	.37, 1.25	-.23	.32	.79	.42, 1.50
Other Latino	.07	.20	1.07	.72, 1.59	.003	.31	1.00	.54, 1.86
College Student (Ref: No)								
Yes	.13	.15	1.14	.86, 1.52	-	-	-	-
Education Level (Ref: No bachelor's degree)								
Completed bachelor's degree or higher	.43	.12	1.53	1.22, 1.93 *	.25	.15	1.28	.97, 1.71
Employment Status (Ref: Unemployed)								
Employed	.04	.18	1.05	.73, 1.49	-	-	-	-
Financial Strain (Ref: More money than needed)								
Just enough money for needs	.11	.33	1.11	.58, 2.13	-	-	-	-
Not enough money to meet needs	.30	.33	1.36	.71, 2.58	-	-	-	-
Health Insurance (Ref: No)								
Yes	.07	.17	1.07	.76, 1.51	-	-	-	-
Study Site (Ref: Arizona)								
Florida	-.27	.14	.76	.58, .99 *	-.07	.28	.94	.54, 1.62
Number of Sexual Partners in the Past 3 Months (Ref: No recent sexual partners) ^b								
1 or 2 sexual partners	.10	.20	1.11	.74, 1.65	-.02	.21	.98	.64, 1.77
3 or more sexual partners	-.03	.26	.97	.59, 1.61	.06	.26	1.06	.65, 1.48
Unprotected Sex in the past 3 months (Ref: No)								

Variable	Model 1				Model 2			
	<i>B</i>	<i>SE</i>	<i>Unadjusted PR</i>	<i>95% CI</i>	<i>B</i>	<i>SE</i>	<i>Adjusted PR (aPR)</i>	<i>95% CI</i>
Yes	.34	.14	1.40	1.07, 1.83 [*]	.23	.13	1.25	.97, 1.64
Age	.08	.03	1.09	1.02, 1.16 [*]	.05	.04	1.05	.97, 1.13
HIV Stigma ^b	−.01	.03	.99	.92, 1.05	−.03	.03	.97	.91 1.03
Familism Support	−.18	.09	.83	.70, .99 [*]	−.22	.09	.81	.68, .95 ^{**}

Notes:

Ref: Reference Group

^a Although not statistically significant in the bivariate analysis, this variable was included in the model to test for moderation.

^b Although not statistically significant in the bivariate analysis, this variable was included in the model to reduce potential confounding effects.

* p-value<0.10;

** p-value<0.05