The Impact of Acculturation on Utilization of HIV Prevention Services and Access to Care Among an at-Risk Hispanic Population

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Abstract

Introduction—HIV/AIDS disproportionately affects Hispanics in the United States, a diverse and heterogeneous population. The purpose of this study was to evaluate the relationship of acculturation with HIV and hepatitis C testing, and access to care among Hispanics at risk for HIV.

Methods—We recruited 600 Hispanics from STD clinics, community-based organizations, and needle exchange programs in Los Angeles County.

Results—Low levels of acculturation were significantly associated with having fewer HIV tests (OR = 1.98; 95% CI = 1.24, 3.15), no hepatitis C tests (OR = 2.61; 95% CI = 1.77, 3.84), testing positive for HIV (OR = 2.67; 95% CI = 1.04, 6.83), and low levels of access to care (β = 0.06; p<.05).

Conclusions—Low levels of acculturation are an important barrier to the use of HIV-related health care services. Our findings may inform the development of effective interventions that address the cultural and behavioral differences among Hispanic subgroups.

Keywords

Acculturation; HIV; hepatitis C; access to care

HIV/AIDS is on the rise in the Hispanic population in the United States. While Hispanics constituted 14% of the U.S. population in 2006,[1] they accounted for 22% of new HIV and AIDS cases.[2] Hispanics tend to be tested for HIV later than any other ethnic group in the United States. Approximately one-third (32%) of Hispanics who test HIV-positive are diagnosed with full-blown AIDS only a month later.[2] Hispanics with HIV infection are also more likely than non-Hispanic Whites to be co-infected with hepatitis C.[3] Infection with certain hepatitis C virus genotypes in HIV-infected individuals may be associated with more rapid progression to AIDS.[4] Thus, Hispanics in the United States are at disproportionately high risk for HIV infection and AIDS, and the epidemic among Hispanics appears to be worsening.

The Hispanic population is extremely heterogeneous, with varying levels of language fluency, immigration status, country of origin, and number of years lived in the United States. This heterogeneity is often represented best using the construct of acculturation. Understanding how acculturation influences the use of HIV prevention and related services, such as HIV counseling and testing, hepatitis C screening, and overall access to medical care is crucial for developing culturally appropriate HIV prevention programs and improving health care services for this diverse population. Increasing access to and utilization of health care services is fundamental to controlling the spread of HIV, and to decreasing morbidity and mortality among those who test HIV positive. Furthermore, those who know their HIV status are less likely to transmit the virus to others.[5]

Acculturation has been defined as an adaptation to a new or different culture.[6] Acculturation is considered a multidimensional concept, and measuring it is complex and challenging.[7-8] To describe and understand the concept of acculturation as it applies to Hispanics in the United States, researchers have used various instruments as well as proxy measures, such as (a) proficiency in, use of, and preference for the Spanish or the English language; (b) generational status in the United States—first, second or third generation; (c) age at immigration; and (d) place of birth (United States *vs*. foreign born).[9-13]

Research on the association of acculturation with HIV testing and HIV status among Hispanics is scarce. A few studies have shown that less acculturated Hispanics, as defined by limited English proficiency and fewer than five years in the United States, are less likely than more acculturated Hispanics to get tested for HIV.[14-15] Other studies have suggested that cultural beliefs and practices, such as traditional gender roles and fatalism (the belief that life events are largely beyond a person's control), together with acculturation, may influence HIV testing practices among Hispanics.[16-19] For example, Mexican American women are often very deferential in their relationships with their physicians. They may not voice concerns about having an HIV test or other HIV-related procedures, and agree to it despite reservations. This might be partly related to acculturation, in that less acculturated women may be less likely to question the physician, and more likely to accept the recommendation that testing be done.[20] No studies of which we are aware examine the association of acculturation with hepatitis C testing and hepatitis C status among Hispanics.

While little is known about the association between acculturation and access to care among Hispanic populations at risk for HIV, highly acculturated Hispanics report greater use of several health care and prevention services than less acculturated Hispanics report.[11-13,20] Use of English as the primary language (compared with use of both languages or of Spanish only) is positively correlated with a higher frequency of cancer screening, vaccinations, diabetes management, cardiovascular disease management, and general physical, vision, and dental check-ups.[7,9,13,21-22] Additionally, women of Mexican descent who were born in the United States have been found more likely than women born in Mexico to use preventive services, including screening for breast and cervical cancer.[7] Less acculturated Hispanics also report more obstacles to obtaining health care services.[11,23] For example, limited English proficiency is associated with poor emotional health and lack of a usual source of health care.[11]

We hypothesized that a low level of acculturation constitutes an important barrier to the use of HIV preventive health care services and access to care among Hispanics at risk for HIV in Los Angeles County. Therefore, in this study we (1) examine the association of acculturation with HIV and hepatitis C testing, (2) explore the relationship of acculturation with HIV and hepatitis C status, and (3) assess the association between acculturation and access to care.

Methods

Participants

Data for this study were collected in 2006 as part of a larger National Institutes of Mental Health (NIMH)-funded study assessing the acceptability of future FDA-approved HIV vaccines among vulnerable communities at elevated risk for HIV infection in Los Angeles County. For this analysis, we examined data from the self-identified Hispanic participants only. Hispanics accounted for 49% of the total sample. Participants at elevated risk for HIV infection were recruited in Los Angeles (LA) County using three-stage probability sampling. In stage I, we randomly selected sites from three venue-based strata: 1) LA County sexually transmitted disease (STD) clinics (n=12); 2) community-based organizations (CBOs) providing HIV-related prevention services to low income Hispanics at high risk for HIV infection (n=8); and 3) needle exchange programs (NEP) providing clean needles or syringes in exchange for used

needles (n=8). Probability-proportional-to-estimated size (PPES) sampling assigned the sampling probability for each site to be proportional to its estimated client load. Stage II consisted of randomly selecting sessions of approximately four hours in duration (morning, afternoon, or evening) within each site. A total of 75 sessions from each stratum were sampled (225 sessions across three strata). In stage III, we randomly selected participants within each session at selected sites. Overall refusal rate was 47% (45% among Hispanics). Of the 600 Hispanics in this study, 377 (63%) were recruited from Hispanic CBOs; 142 (23%) were recruited from STD clinics; and 81 (14%) were recruited from the needle exchange programs. Refusal rate did not significantly differ by site.

An individual was eligible for the study if she or he was 18 years of age or older, not an employee of the recruitment site, English- or Spanish-speaking, and capable of providing informed consent based on medical and research staff observations. On site, face-to-face 60-minute interviews were administered by trained interviewers who were all bilingual (English and Spanish) using laptop computers programmed with Questionnaire Development System (QDS) software.[24] Individuals were given $20 for their participation. The study protocol was reviewed and approved by the UCLA, University of Toronto, and Los Angeles County Dept. of Health Services Institutional Review Boards. All 600 of the Hispanic participants in this study provided informed consent.

Measures

The interview items used for this study covered socio-demographic characteristics, HIV testing, HIV status, hepatitis C testing, hepatitis C status, acculturation, and access to care.

Socio-demographic characteristics—Socio-demographic information collected included sex, age, education, annual income, health insurance coverage, sexual orientation, and intravenous drug use in the past 30 days (Table 1).

HIV testing and HIV status—HIV testing was assessed by the question, "How many times have you been tested for HIV?" We dichotomized this continuous variable as 1 *versus* 2 or more, since the CDC recommends routine testing for persons at high risk for HIV.[25] Self-reported HIV status was assessed using the item, "What was the result of your most recent HIV test?" Response categories included HIV positive, HIV negative, did not receive result, still waiting for result, don't know (Table 1).

Hepatitis C testing and hepatitis C status—Hepatitis C testing was assessed by the question, "Have you ever been tested for hepatitis C?" (*yes/no*). We assessed hepatitis C status by using the item, "Have you ever tested positive for hepatitis C?" (*yes/no*) (Table 1).

Acculturation—We used four items to measure acculturation, including primary language spoken at home (English *vs*. Spanish), whether participants were born in the United States (*yes/no*), number of years living in the United States (*10 years or less vs. more than 10 years*), and current immigration status (*documented vs. undocumented*) (Table 2). Participants were asked to specify their current immigration status. Response categories were U.S. citizen or permanent resident; visa for work, student visa, or tourist visa; and *undocumented*. Those who reported being a permanent resident or who were in the U.S. on a visa were considered *documented*. Those who reported being undocumented were categorized as *undocumented*. We dichotomized number of years in the United States as *10 years or less vs. more than 10 years* to reflect the changes in immigration-related laws over the past decade. The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 further restricted the provision of many federal, state, and local public services to undocumented

immigrants, possibly making it even more difficult to obtain health care services than it was before PRWORA.[26-27]

We created a dichotomous acculturation variable (*low acculturation vs. high acculturation*) from the four individual acculturation variables to evaluate acculturation with HIV testing, hepatitis C testing, and hepatitis C status since these measures are dichotomous variables. To create the dichotomous variable, we first created an acculturation scale, where a code of 0 was assigned to the variable from each of the four dichotomous pairs representing the lower level of acculturation (Spanish speakers, not born in the United States, 10 years or less in the United States, and undocumented). A code of 1 was assigned to the variable from each of the four dichotomous pairs representing the higher level of acculturation (English speakers, born in the United States, more than 10 years in the United States, and documented). We then summed the score of the four acculturation measures to obtain a scale ranging from 0 (lowest level of acculturation) to 4 (highest level of acculturation). For example, a score of 0 would indicate that the individual received a code of 0 on each of the four individual acculturation measures. If an individual was a Spanish speaker (code of 0) who was not born in the United States (code of 0), but had been in the United States for more than 10 years (code of 1) and was documented (code of 1), they would have an acculturation score of 2. Finally, if an individual was an English speaker (code of 1) who was born in the United States (code of 1), had been in the United States for more than 10 years (code of 1) and was documented (code of 1), they would have an acculturation score of 4. Those individuals assigned a score of 2 (the mean value of the acculturation scale) or less on the constructed acculturation scale were classified as having low levels of acculturation, and those individuals assigned a score of 3 or 4 on the constructed acculturation scale were classified as having high levels of acculturation.

To assess acculturation in relation to access to care, we used the acculturation scale as a continuous measure. Given that the access-to-care scale is a continuous measure, and has been shown to be reliable and to predict important health outcomes in several studies, we decided to use a continuous measure to assess this relationship.[28-30] We converted the 0 to 4 scale to a 0 to 100 scale (0, 25, 50, 75, 100), where 0 represents the lowest level of acculturation and 100 represents the highest level of acculturation. All four items in the acculturation scale were significantly correlated with each other ($p < .001$). Cronbach's alpha for this scale was 0.77.

Access to care—We used a six-item access to care measure (alpha = 0.75) derived from the HIV Cost and Services Utilization Study (HCSUS) and covering affordability, availability, convenience, and specialist accessibility.[28-30] These items are presented in Table 3. We transformed linearly the five-point Likert scale (strongly agree, somewhat agree, unsure, somewhat disagree, strongly disagree) to a 0 to 100 scale (0, 25, 50, 75, 100), where 0 represents the lowest level of access to care and 100 indicated the highest level of access to care. The mean of the six items provided a continuous measure. This measure has been shown to be reliable and to predict important health outcomes in several studies.[28-30]

Data analysis

First, we examined the distributions of all independent and dependent variables. Second, we performed bivariate analyses to examine the unadjusted relationship between acculturation with HIV and hepatitis C testing, HIV and hepatitis C status, and access to care. Third, we used multiple logistic regression to estimate the relationship between acculturation with HIV and hepatitis C testing, and HIV and hepatitis C status adjusting for gender, age, education, income, insurance, and risk category. Intravenous drug use was not included as a covariate in this model due to collinearity. Fourth, we used multiple linear regression to estimate the adjusted association between the access-to-care scale and acculturation adjusting for socio-demographic characteristics and intravenous drug use. Finally, given that legal status of undocumented

immigrants may be an important barrier to use of and access to HIV-related health care services, we examine the association between immigration status and access to care, immigration status and HIV testing, and immigration status and health insurance. All analyses were conducted using STATA 8.0 (Stata Corp, College Station, TX).

Results

Demographic characteristics

There were more female participants (55%) than male. Approximately half of the participants were between the ages of 17-34 years (49%), 45% reported less than a high school education, 37% reported an annual income of less than $10,000, and over half (54%) reported no health insurance. Twelve percent reported being men who have sex with men (MSM), and 10% reported engaging in injection drug use in the past 30 days (Table 1).

HIV and hepatitis C characteristics

Almost three-quarters (71%) of participants reported having had two or more HIV tests. A total of 6% of the participants reported being HIV positive, and another 6% either were unsure of their status or had not received their HIV test results. Over one-third (37%) of participants reported being tested for hepatitis C, and of those who were tested, 24% had tested positive. Of those participants who reported having both an HIV and a Hepatitis C test, 3% were co-infected with HIV and hepatitis C (Table 1).

Acculturation and utilization of HIV prevention services

Spanish was the primary language spoken by participants (75%). Fewer than half reported being born in the United States (38%). Most of the foreign-born participants were from Mexico (64%). About one quarter (23%) of participants had been living in the United States for less than 10 years, and 24% of those currently living in the United States reported being undocumented (Table 2). Level of acculturation varied significantly across recruitment sites (p<.001). Participants recruited from STD clinics and CBOs serving Hispanics were significantly less acculturated than participants recruited from NEPs.

In bivariate logistic regression analyses, low levels of acculturation were significantly associated with having fewer HIV tests (OR = 2.21; 95% CI = 1.43, 3.42; p <.001), never getting tested for hepatitis C (OR = 2.64; 95% CI = 1.85, 3.76; p <.001), testing negative for hepatitis C (OR = 0.38; 95% CI = 0.19, 0.77; p <.01), and non-injection drug use (OR = 0.04; 95% CI = 0.02, 0.12; p <.001).

After adjusting for socio-demographic characteristics in the multivariate analyses, low levels of acculturation were significantly associated with having fewer HIV tests (OR = 1.98; 95% CI = 1.24, 3.15), testing positive for HIV (OR = 2.67; 95% CI = 1.04, 6.83), never getting tested for hepatitis C (OR = 2.61; 95% CI = 1.77, 3.84), and testing negative for hepatitis C (OR = 0.37; 95% CI = 0.17, 0.82) (Table 4). Low levels of acculturation were also significantly associated with non-injection drug use (OR = 0.03; 95% CI = 0.01, 0.08; p <.001).

Multivariate analyses also showed that participants without health insurance were less likely to test positive for HIV than those with health insurance (OR = 0.19; 95% CI = 0.07, 0.53). Bisexuals and MSM were more likely than heterosexuals to test positive for HIV (OR = 7.13; 95% CI = 2.75, 18.48) (Table 4).

Acculturation and access to care

Ninety-four percent of participants reported low access to care on at least one of the six access to care items. Reports of difficulty accessing care ranged from 29% for medical care facilities

not conveniently located to 58% for cost being a problem and 59% for not being able to access medical specialists (Table 3).

In bivariate analyses, higher levels of acculturation were significantly associated with higher levels of access to care ($\beta = 0.10$; 95% CI = 0.05, 0.15; p <.001). This association remained statistically significant in the multivariate analyses ($\beta = 0.06$; 95% CI = 0.01, 0.18; p<0.05) (Table 5). Multivariate analyses also showed that those with a higher annual income had higher levels of access to care ($\beta = 1.74$; 95% CI = 0.01, 3.49; p< .05). Participants who reported no health insurance had lower levels of access to care ($\beta = -15.87$; 95% CI = -19.33, -12.41; p<. 001), and those who reported injection drug use in the past 30 days also had lower levels of access to care ($\beta = -8.24$; 95% CI = -14.10, -2.38; p<.01) (Table 5).

Immigration status and access to care, HIV testing, Hepatitis C testing, and insurance

Documented participants were significantly more likely than undocumented participants to have two or more HIV tests (OR = 1.90; 95% CI = 1.21, 2.98), been tested for hepatitis C (OR = 2.06; 95% CI = 1.32, 3.21), and to have health insurance (OR = 3.46; 95% CI = 2.27, 5.27).

Discussion

In this socioeconomically diverse sample of Hispanics at risk for HIV in Los Angeles County, we found that participants with low levels of acculturation were less likely to get tested for HIV and hepatitis C than participants with high levels of acculturation, and were more likely to test positive for HIV. Lower acculturation levels were also significantly associated with lower levels of access to health care services. These findings support our hypothesis that low levels of acculturation are an important barrier to the use of HIV-related prevention services and access to medical care. Thus, targeted interventions designed to improve the use of HIV-related counseling and prevention services and access to care are crucial to meeting the health care needs of individuals from this vulnerable population and optimizing their health.

Low levels of acculturation were significantly associated with both lack of HIV testing and testing positive for HIV. Others studies, similarly, have identified an association between lower levels of acculturation and lower likelihood of HIV testing among Hispanics.[14-15] HIV testing patterns may differ by Hispanic subcultures. For example, Mexicans and Mexican Americans have been found less likely than Puerto Ricans to have been tested for HIV.[14]

HIV testing and counseling are fundamental to HIV prevention strategies in the United States. This prevention strategy relies on the underlying premise that knowledge of HIV serostatus provides the basis for patient-centered risk reduction counseling.[5] Recognition of the impact of acculturation on HIV testing patterns is valuable for developing and refining current strategies that focus on increasing HIV testing among the diverse U.S. Hispanic population. There are no studies, of which we are aware, that have examined the association between acculturation and HIV status. Our findings suggest that lower levels of acculturation are associated with greater risk for HIV infection. Thus, increasing access to HIV testing and health care services is crucial for improving HIV detection, quality of care, and HIV-related health outcomes among U.S. Hispanics.

Low levels of acculturation were significantly associated with lack of hepatitis C testing. There are no studies, to our knowledge, that have examined the association of acculturation with hepatitis C testing and hepatitis C status in Hispanics. Hepatitis C and HIV share common routes of infection, including injection drugs and sexual intercourse. One out of every four people with HIV also has hepatitis C.[31] Chronic hepatitis C disease progression is accelerated in individuals co-infected with HIV.[31] The U.S. Public Health Service/Infectious Diseases Society of America (USPHS/IDSA) guidelines recommend that all HIV-infected persons be

screened for hepatitis C.[4] Prevention of hepatitis C infection for those not already infected, and reducing chronic liver disease in those who are infected are important concerns for people living with HIV and their health care providers.[4] Our finding that participants with higher levels of acculturation were more likely to test positive for hepatitis C than those with lower levels of acculturation may be explained by the significant association between high levels of acculturation and injection drug use. A number of studies have similarly found that injection drug use is associated with higher levels of acculturation. [32-35] Given that injection drug use is the most common cause of hepatitis C in the United States, if more highly acculturated Hispanics are more likely to be injection drug users, they also may be more likely to test positive for hepatitis C. [36]

Multivariate analyses also showed that lack of health insurance was significantly associated with testing positive for HIV. A CDC-Kaiser Family Foundation study of data from 25 states revealed similar findings.[37] Bisexuals and MSM were more likely to test positive for HIV than heterosexuals. This finding is not surprising given that male to male sexual contact is the primary cause of HIV infection among Hispanics in the United States.[38]

In both bivariate and multivariate analyses, lower levels of acculturation were significantly associated with lower levels of access to care. There are few studies that have examined the impact of acculturation on access to medical care among at-risk or HIV positive Hispanics. A previous study examined the association of acculturation with access to dental care, usual source of care, outpatient visits, emergency department visits, and hospitalizations among Hispanics infected with HIV.[12] This study found that obtaining needed dental care was significantly associated with being less acculturated, and not having a usual source of dental care was associated with being a non-United States citizen. Other studies have shown that language barriers can impede access to care among Hispanics in general.[11,13,39-40] Early access to appropriate health care and preventive services (such as HIV testing and counseling) is critical. For those participants in our sample who are HIV positive, hepatitis C positive, or are co-infected with HIV and hepatitis C, lack of access or delayed access to care may result in clinical presentation at more advanced stages of disease. Late clinical presentation with severe manifestations of HIV or hepatitis C may require more intensive medical interventions and may lead to some hospitalizations that might have been prevented, as well as potentially leading to an increase in mortality.[41] A number of socio-demographic characteristics were also significantly associated with access to care. Hispanics with higher annual incomes had better access to care. This finding supports previous studies showing that socioeconomic factors are important determinants of health care use among immigrants and Hispanics in general.[26, 42-43] Furthermore, participants who reported no insurance had worse access to care. Numerous studies support this finding.[26,44-45] Finally, those who reported intravenous drug use also had lower levels of access to care. Previous studies have documented similar findings.[12,46]

Documented participants were significantly more likely than undocumented participants to receive HIV tests, hepatitis C tests, and to have health insurance. Thus, immigration status may serve as a barrier to the use of HIV-related prevention services, such as HIV and hepatitis C testing. We did not find a significant association between immigration status and access to care. This finding may relate to the 1996 change in law that established a 5 year bar on the receipt of publicly funded health care services to undocumented immigrants, so that it is not just a question of documented vs. undocumented but when the individual became documented.

There are limitations to our study. First, this study was limited to a Hispanic population at risk for HIV in Los Angeles County, and may not be generalizable to other at-risk Hispanic populations. The majority of participants in this study (64%) were from Mexico. The socio-cultural and economic characteristics of this Hispanic population that influence access to care and use of health care services may differ for the numerous other sub-groups of Hispanics in

the United States; nevertheless, the findings raise important concerns regarding access to HIV prevention and health care among a vulnerable community and merit investigation among other Hispanic subgroups. Second, although our measure of access to care was self-reported, considerable evidence from previous HIV samples support the validity of this measure.[27,29, 47-49] Our measure of acculturation was a self-reported four-item scale that may have lacked the sensitivity of a more in-depth acculturation questionnaire; nevertheless, it had a fairly high reliability (Cronbach's alpha 0.77). Reporting bias is possible for the acculturation item asking about citizenship status, as undocumented immigrants might fear discovery and deportation; however, one-quarter of our sample identified as undocumented. Finally, HIV status and hepatitis C status were self-reported, leaving the potential for reporting bias.

Despite these limitations, this investigation provides valuable information regarding the relationships between acculturation levels and HIV, and among hepatitis C testing, HIV and hepatitis C status, and access to care. The development of prevention programs targeting an at-risk Hispanic population might include an emphasis on outreach efforts to monolingual Spanish speakers and the undocumented, as well as providing education and advocacy on behalf of this population to assist in navigating the U.S. health care system, and providing access to Spanish language hotlines and confidential HIV testing and counseling sites. Programs directed at health care providers are also needed to educate providers about the role of acculturation, its effects in key areas that limit access to services, and strategies to tailor services for Hispanic people based on their acculturation levels.[11,13,50] Future large scale studies on the at-risk Hispanic population are needed to explore further the extent to which acculturation influences HIV and hepatitis C testing, HIV and hepatitis C status, and access to care among Hispanics, so that we may build an evidence base and develop effective interventions that address the relevant cultural and behavioral traits of Hispanic subgroups.

References

1. United States Census Bureau. Hispanics in the United States. [accessed on September 29, 2008]. http://www.census.gov/population/www/socdemo/hispanic/hispanic_pop_presentation.html

2. HIV/AIDS Surveillance Report: Cases of HIV infection and AIDS in the United States and Dependent Areas. Centers for Disease Control and Prevention; [accessed July 6, 2008]. 2006 http://www.cdc.gov/hiv/topics/surveillance/resources/reports/2006report/pdf/2006SurveillanceReport.pdf

3. Tedaldi, EM.; Hullsiek, KH.; Malvestutto, CD., et al. Prevalence and characteristics of Hepatitis C virus coinfection in a Human Immunodeficiency Virus clinical trails group: The Terry Beirn community programs for clinical research on AIDS. 2003. p. 1313-1317.

4. Frequently asked questions and answers about co-infection with Hepatitis C virus. Centers for Disease Control and Prevention; [accessed October 18th, 2008]. 2007 http://www.cdc.gov/hiv/resources/qa/HIV-HCV_Coinfection.htm

5. Centers for Disease Control. Advancing HIV prevention: New strategies for a changing epidemic also emphasize the need to promote testing and knowledge of serostatus. MMWR Morb Mortal Wkly Rep 2003;52(RR-19):329–332. [PubMed: 12733863]

6. Leybas-Amedia V, Nuno T, Garcia F. Effect of acculturation and income on Hispanic women's health. J Health Care Poor Underserved 2005;16(4 suppl A):128–141. [PubMed: 16327101]

7. Lara M, Gamboa C, Kahramanian M, et al. Acculturation and Latino health in the United States: A review of the literature and its sociopolitical context. Annu Rev Public Health 2005;26:367–397. [PubMed: 15760294]

8. Marin, G. Issues in the measurement of acculturation among Hispanics. In: Geisinger, KF., editor. Psychological Testing of Hispanics. American Psychological Association; Washington DC: 1992. p. 23-51.

9. Solis JM, Marks G, Garcia M, et al. Acculturation, access to care, and use of preventive services by Hispanics: Findings from HHANES 1982-1984. Am J Public Health 1990;80(suppl):11–19. [PubMed: 9187576]

10. Marks G, Cantero PJ, Simoni JM. Is acculturation associated with sexual risk behaviors? An investigation of HIV positive Latino men and women. AIDS Care 1998;10(3):283–295. [PubMed: 9828972]

11. Ponce NA, Hays RD, Cunningham WE. Linguistic disparities in health care access and health status among older adults. J Gen Intern Med 2006;21(7):786–791. [PubMed: 16808783]

12. Morales LS, Cunningham WE, Galvan FH, et al. Sociodemographic differences in access to care among Hispanic patients who are HIV infected in the United States. Am J Public Health 2004;94(7): 1119–1121. [PubMed: 15226129]

13. Cheng EM, Chen A, Cunningham WE. Primary language and receipt of recommended health care among Hispanics in the United States. J Gen Intern Med 2007;22(Suppl 2):786–791.

14. Lopez-Quintero C, Shtarkshall R, Neumark YD. Barriers to HIV testing among Hispanics in the United States: Analysis of the National Health Interview Survey 2000. AIDS Patient Care STDS 2005;19(10):672–683. [PubMed: 16232051]

15. Sabogal F, Catania JA. HIV risk factors, condom use, and antibody testing among heterosexual Hispanics: The National AIDS Behavioral Surveys (NABS). Hisp J Behav Sci 1996;18(3):367–391. [PubMed: 12320746]

16. Parro EO, Doran TI, Ivy LM, et al. Concerns of pregnant women about being tested for HIV: A study in a predominantly Mexican-American population. AIDS Patient Care STDS 2001;15(2):83–93. [PubMed: 11224934]

17. Rothenberg KH, Paskey SJ, Reuland MM, et al. Domestic violence and partner notification: Implications for treatment and counseling of women with HIV infection. J Am Med Women's Assoc 1995;50(3-4):87–93.

18. Gilchrest BA. Partner notification and the threat of domestic violence against women with HIV infection. N Engl J Med 1993;329:1194–1196. [PubMed: 8377787]

19. Strebel A. Prevention implications of AIDS discourses among South African women. AIDS Educ Prev 1996;8:352–374. [PubMed: 8874652]

20. Chesney AP, Chavira JA, Hall RP, et al. Barriers to medical care of Mexican-Americans: The role of social class, acculturation, and social isolation. Med Care 1982;20(9):883–891. [PubMed: 7121094]

21. Hu DJ, Covell RM. Health care usage by Hispanic outpatients as function of primary language. West J Med 1986;144(4):490–493. [PubMed: 3716414]

22. Marks G, Garcia M, Solis JM. Health risk behaviors of Hispanics in the United States: Findings from HHANES, 1982-1984. Am J Public Health 1990;80(Suppl):20–26. [PubMed: 9187577]

23. Wells KB, Golding JM, Hough RL, et al. Acculturation and the probability of use of health care services by Mexican-Americans. Health Serv Res 1989;24(2):237–257. [PubMed: 2732058]

24. QDS Software. Questionnaire Development System [computer program]. Version 2.1. NOVA Research Company; Bethesda, MD:

25. Centers for Disease Control and Prevention. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health care settings. MMWR Morb Mortal Wkly Rep 2006;55 (RR-14):1–17. [PubMed: 16410759]

26. Kullgren JT. Restrictions on undocumented immigrants' access to health services: The public implications of welfare reform. Am J Public Health 2003;93(10):1630–1633. [PubMed: 14534212]

27. Nandi A, Galea S, Lopez G, et al. Access to and use of health services among undocumented Mexican immigrants in a US urban area. Am J Public Health 2008;98(2):1–10.

28. Cunningham WE, Hays RD, Williams KW, et al. Access to medical care and health-related quality of life for low income persons with symptomatic human immunodeficiency virus. Med Care 1995;33 (7):739–754. [PubMed: 7596212]

29. Cunningham WE, Hays RD, Ettl MK, et al. The prospective effect of access to medical care on health-related quality of life outcomes in patients with symptomatic HIV disease. Med Care 1998;36(3): 295–306. [PubMed: 9520955]

30. Cunningham WE, Andersen RM, Katz MH, et al. The impact of competing subsistence needs and barriers on access to medical care for persons with human immunodeficiency virus receiving care in the United States. Med Care 1999;37(12):1270–1281. [PubMed: 10599608]

31. Hepatitis C transmission: How do you get Hepatitis C?. Hoffman-LaRoche Inc.; [accessed September 17th, 2008]. 2002-2008 http://www.pegasys.com/basics/hepatitis-c-spread.aspx

32. Levy V, Page-Shafer K, Evan J, et al. HIV-related risk behavior among Hispanic immigrant men in a population-based household survey in low income neighborhoods of Northern California. Sexually Transmitted Diseases 2005;32(8):487–490. [PubMed: 16041250]

33. Delgado M, Lundgren LM, Deshpande A, et al. The association between acculturation and needle sharing among Puerto Rican injection drug users. Eval Program Plann 2008;31(1):83–91. [PubMed: 17706285]

34. Warner LA, Valdez A, Vega WA, et al. Hispanic drug abuse in an evolving cultural context: An agenda for research. Drug Alcohol Depend 2006;84(suppl 1):S8–S16. [PubMed: 16750335]

35. Ortega AN, Rosenheck R, Alegria M, et al. Acculturation and the lifetime risk of psychiatric and substance use disorders among Hispanics. J Nerv. Mental Dis 2000;188:728–735.

36. Frequently asked questions and answers about co-infection with Hepatitis C virus. Centers for Disease Control and Prevention; [accessed October 18th, 2008]. 2007 http://www.cdc.gov/hiv/resources/qa/HIV-HCV_Coinfection.htm

37. Kates J, Levi J. Insurance coverage and access to HIV testing and treatment: Considerations for individuals at risk for infection and for those with undiagnosed infection. CID 2007;45(suppl 4):S255–S260.

38. CDC HIV/AIDS Fact Sheet: HIV/AIDS among Hispanics/Latinos. [accessed October 29th, 2008]. 2007 http://www.cdc.gov/hiv/hispanics/resources/factsheets/hispanic.htm

39. Rojas-Guyler L, Ellis N, Sanders S. Acculturation, health protective sexual communication, and HIV/AIDS risk behavior among Hispanic women in a large Midwestern city. Health Educ Behav 2005;32 (6):767–779. [PubMed: 16267147]

40. Timmins C. The impact of language barriers on the health care of Latinos in the United States: A review of the literature and guidelines for practice. J Midwifery Womens Health 2002;47(2):80–96. [PubMed: 12019990]

41. Woloshin S, Schwartz L, Katz S, et al. Is language a barrier to the use of prevention services? J Gen Intern Med 1997;12(8):472–477. [PubMed: 9276652]

42. Cunningham WE, Mosen DM, Hays RD, et al. Access to community-based medical services and number of hospitalizations among patients with HIV disease: Are they related? J Acquir Immune Defic Syndr Hum Retrovirol 1996;13(4):327–335. [PubMed: 8948370]

43. Hubbell FA, Waitzkin H, Mishra SI, et al. Access to medical care for documented and undocumented Latinos in Southern California County. West J Med 1991;154(4):414–417. [PubMed: 1877182]

44. Wagner TH, Guendelman S. Healthcare utilization among Hispanics: Findings from the 1994 minority health survey. Am J Manag Care 2000;6(3):355–364. [PubMed: 10977435]

45. Smedley, BD.; Stitch, AY.; Nelson, AR. Unequal treatment: Confronting racial and ethnic disparities in health care. Institute of Medicine; Washington DC: 2002.

46. Cunningham WE, Sohler NL, Tobias C. Health services utilization for people with HIV infection: Comparison of a population targeted for outreach with the United States population in care. Med Care 2006;44(11):1038–1047. [PubMed: 17063136]

47. Wood E, Kerr T, Tyndall MW, et al. A review of barriers and facilitators of HIV treatment among injection drug users. AIDS 2008;22(11):1247–1256. [PubMed: 18580603]

48. Schuster MA, Collins R, Cunningham WE, et al. Perceived discrimination in clinical care in a nationally representative sample of HIV-infected adults receiving health care. J Gen Intern Med 2005;20(9):807–813. [PubMed: 16117747]

49. Weissman JS, Levin K, Chasen-Taber S, et al. The validity of self-reported health care utilization by AIDS patients. AIDS 1996;10(7):775–783. [PubMed: 8805870]

50. Ramos RL, Hernandez A, Ferreira-Pinto JB, et al. Promovision: Designing a capacity building program to strengthen and expand the role of promotores in HIV prevention. Health Promot Pract 2006;7(4):444–449. [PubMed: 16840772]

Table 1

Socio-demographic, HIV, and Hepatitis C characteristics of Hispanics (N=600)

Characteristics	N	(%)
Socio-demographics		
Sex		
Male	270	(45)
Female	330	(55)
Age		
17-34	296	(49)
35-49	196	(33)
50+	108	(18)
Education		
Less than high school	272	(45)
High school degree	160	(27)
Greater than high school	168	(28)
Annual income ($)		
0-4,000	113	(19)
5,000-9,999	110	(18)
10,000-24,999	270	(45)
>25,000	107	(18)
Insurance		
No insurance	322	(54)
Public	189	(31)
Private	89	(15)
Sexual orientation		
Heterosexual	526	(88)
Homosexual/bisexual	74	(12)
Intravenous drug use in past 30 days		
Yes	62	(10)
No	538	(90)
HIV and Hepatitis C Characteristics		
Number of lifetime HIV tests[a]		
1	134	(29)
2+	323	(71)
HIV status[a]		
Positive	27	(6)
Negative	401	(88)
Unsure/did not receive results	29	(6)
Ever tested for Hepatitis C[b]		
Yes	208	(37)
No	351	(63)
Hepatitis C status[c]		

Characteristics	N	(%)
Positive	49	(24)
Negative	156	(76)
HIV-Hepatitis C co-infection[d]	5	(3)

[a]N = 457

[b]N = 559

[c]N = 205 Based on those participants who reported having had a Hepatitis C test.

[d]N = 180 Based on those participants who reported having had an HIV and Hepatitis C test.

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Table 2

Acculturation characteristics (N=600)

Acculturation	N	(%)
Primary language spoken		
English	150	(25)
Spanish	450	(75)
Born in the U.S.		
Yes	230	(38)
No	370	(64)
Country of origin[a]		
Mexico	236	(64)
El Salvador	72	(20)
Guatemala	29	(8)
Other	33	(8)
Years in the US		
<=10 years	141	(23)
>10 years	459	(77)
Immigration status[b]		
Documented	448	(76)
Undocumented	145	(24)

[a]N=370. Based on those participants who reported not being born in the U.S.

[b]N=593

Table 3

Frequency of individuals reporting low access to care.

	Disagree Responses[a] (%)
Low access items (n = 600)	
1. If I need hospital care, I can get admitted without any trouble	33
2. It is easy for me to get medical care in an emergency	48
3. I have never gone without the medical care needed because it is too expensive	58
4. I have easy access to the medical specialists that I need	59
5. Places where I can get medical care are very conveniently located	29
6. I am able to get medical care whenever I need it	31
Reported low access to 1 or more of the above items	94

[a] Low level of access is defined as strongly/somewhat disagree or unsure to the items above.

Table 4

Logistic Regression Analysis of HIV testing, HIV status, Hepatitis C testing, and Hepatitis C status on acculturation adjusted for socio-demographics (Odds Ratio [95% CI])

Dependent Variable: Variable (Reference Group)	Number of HIV tests (<2 lifetime test) (N= 458)	HIV status (positive) (N = 428)	Hepatitis C testing (never tested) (N = 559)	Hepatitis C status (positive) (N = 205)
Acculturation level (high)				
Low	1.98 (1.24 to 3.15) [b]	2.67 (1.04 to 6.83) [a]	2.61 (1.77 to 3.84) [b]	0.37 (0.17 to0.82)[a]
Sex (Female)				
Male	1.00 (0.64 to 1.56)	2.59 (0.98 to 6.89)	0.84 (0.58 to 1.22)	1.22 (0.58 to 2.59)
Age (18-34)				
50+	1.69 (1.09 to 2.64) [a]	1.13 (0.45 to 2.82)	0.62 (0.42 to 0.91) [a]	2.41 (1.05 to 5.53) [a]
Education (< than high school)				
High school	0.91 (0.54 to 1.56)	0.82 (0.27 to 2.47)	0.82 (0.51 to 1.30)	1.10 (0.46 to 2.64)
> than high school	1.07 (0.61 to 1.86)	0.71 (0.21 to 2.39)	0.68 (0.42 to 1.10)	0.33 (0.11 to 0.97) [a]
Income (<$10,000)				
10,000-24,999	1.04 (0.66 to 1.66)	0.24 (0.08 to 0.73) [a]	1.21 (0.80 to 1.81)	0.40 (0.18 to 0.89) [a]
25,000+	0.76 (0.38 to 1.52)	0.39 (0.10 to 1.45)	1.28 (0.74 to 2.20)	0.20 (0.05 to 0.79) [a]
Insurance (yes)				
No	1.11 (0.72 to 1.73)	0.19 (0.07 to 0.53) [b]	0.91 (0.62 to 1.33)	0.55 (0.26 to 1.18)
Risk category (Heterosexual)				
MSM/bisexual	0.59 (0.30 to 1.45)	7.13 (2.75 to 18.49) [c]	0.57 (0.33 to 0.97) [a]	1.47 (0.57 to 3.87)

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

Table 5

Multivariate linear regression analysis of access to care by acculturation adjusted for socio-demographics (N=448)

Variable	Access to care
	β(95% CI)
Acculturation	0.06 (0.01 to 0.18) [a]
Sex	−0.58 (−3.96 to 2.79)
Age	−1.08 (−3.32 to 1.16)
Education	−0.80 (−2.96 to 1.636)
Yearly income	1.74 (0.01 to 3.49)
No insurance	−15.87 (−19.33 to − 12.41) [c]
Drug use in past 30 days	− 8.24 (−14.10 to −2.38) [b]
Sexual orientation	−0.96 (−6.12 to 4.20)

[a] $P<0.05$

[b] $P<0.01$

[c] $P<0.001$.