HIV Testing Beliefs in a Predominantly Hispanic Community Health Center During the Routine HIV Testing Era: Does English Language Ability Matter?

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Abstract

The Hispanic population in the U.S. carries a disproportionate burden of HIV. Despite the high prevalence of HIV, many Hispanics remain untested for HIV. The purpose of this study conducted in a predominantly Hispanic-serving community health center in a high HIV prevalence area was to understand patient beliefs of who should be tested for HIV in the routine HIV testing era. Survey participants were presented with nine populations of people that should be tested for HIV based on CDC HIV testing recommendations. Of the 90 participants (67.1% Hispanic) who answered the HIV testing beliefs question, only approximately 45% were aware that all adults and teenagers should be HIV tested. Only 30% correctly identified all nine populations of people that should be tested for HIV based on CDC HIV testing recommendations. Our study suggests that Hispanics are either unaware of or disagree with the latest CDC recommendations for routine HIV testing of all persons ages 13–64 in high HIV prevalence areas. Improving knowledge of the current HIV epidemiologic profile in the U.S. and the most recent routine HIV testing recommendations may improve HIV testing rates in Hispanic communities.

Introduction

IN THE UNITED STATES, over 1 million people are infected with HIV and each year there are approximately 50,000 new HIV infections.¹ It is estimated that over 20% of Americans with HIV are unaware of their status,¹ and that these unaware persons are contributing to approximately 50% of new infections.² HIV testing is a U.S. Centers for Disease Control and Prevention (CDC) recommended HIV prevention strategy. Because of the well-documented benefits of earlier HIV testing and diagnosis of HIV,^{3,4} in 2006 the CDC issued recommendations for routine HIV testing of all persons ages 13–64 years in healthcare settings in high HIV prevalence areas.⁵

One community that carries a disproportionate burden of the HIV epidemic in the United States is the Hispanic/Latino population. Although this community represents only 16% of the U.S. population, Hispanics/Latinos accounted for 20% of new HIV infections in the U.S. in 2009.⁶ It is estimated that 1 in 36 Latino men and 1 in 106 Latina women will be diagnosed

with HIV in their lifetime.⁶ The U.S. Census Bureau predicts that by 2050 nearly one-third of the U.S. population will be of Hispanic/Latino ethnicity.⁷ Given that the Hispanic/Latino community is a fast growing ethnic minority group in the United States, focused attention must be given to the disproportionate HIV burden affecting this community.

Despite the high HIV prevalence in Hispanic/Latino communities, many people go untested. Based on data from the National Health Interview Survey, in 2008, only 48% of Hispanics reported ever being tested for HIV.⁸ More recently, in a 2011 national survey conducted by the Kaiser Family Foundation, 44% of Hispanic/Latino respondents reported never being tested for HIV.⁹ In fact, it is estimated that nearly 22% of Hispanics living with HIV remain undiagnosed because they have not been tested.¹⁰ Unfortunately, when Hispanics/Latinos are tested for HIV, they are tested late: 48% are tested for HIV within 3 years of an AIDS-defining diagnosis.¹¹ In summary, among Hispanic/Latinos, the problem is twofold: low rates of HIV testing and testing at later stages of

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infection. Both problems must be overcome to reduce ongoing HIV transmission in Hispanic/Latino communities.

In 2011, low risk perception remained the most prominent reason Hispanics/Latinos reported for not having been HIV tested.⁹ Not surprisingly, low perceived risk predicts negative future intentions for HIV testing among Hispanics.¹² Given that recent research has highlighted low perception of risk as an ongoing barrier to accepting HIV testing even when testing is offered routinely in healthcare settings,¹³ the purpose of this study, which was conducted in a community health center serving predominantly Hispanic/Latino patients, was to understand patient beliefs about who should be tested for HIV. Rather than asking participants about their own risk factors or if they think they have risks requiring HIV testing—potentially sensitive topics that may lead to underreporting, this study reformatted the context of the question to query participants on what populations they thought were at risk for HIV and, therefore, should be tested. Understanding these beliefs could help guide campaigns to educate patients about the current epidemiologic profile of the HIV epidemic and the recommendations and need for routine HIV testing for all persons ages 13–64 years in healthcare settings.

Methods

Between October 2010 and March 2011, a cross-sectional survey was conducted at a primary care community health center in the Harris County Hospital District (HCHD) in Harris County, TX. Harris County has the second largest Hispanic population in the country.¹⁴ This community health center serves low-income residents in the area, of which over 50% are Hispanic/Latino.¹⁵

Participants for this study were recruited while they were in the health center waiting room and were considered eligible for participation if they were between the ages of 18–64 years. When patients returned to the waiting room after completing their doctors' appointment, they were randomly approached and asked if they were interested in study participation. The survey presented nine populations of people that should be tested for HIV based on the most recent CDC recommendations for a high HIV prevalence area (e.g., men who have sex with men, all adults, all teenagers). Participants were asked to respond to, "I think the following people should be tested for HIV." The nine populations presented in the response choices were: people who have sex for money or drugs, people who have more than one sex partner at a time, people who have unprotected sex, men who have sex with men, people who use intravenous drugs, women who are pregnant, people who have more than one sex partner in a lifetime, all adults, and all teenagers. Notably, given that the CDC recommendations state that everyone ages 13–64 in high HIV prevalence areas should be tested, the correct answer to all of our nine items should be "yes." Response options were "yes," "no," and "I'm not sure." Questions pertaining to demographic characteristics (e.g., age, gender, race/ethnicity) of the study population were also asked. Since a large portion of the health center's patients are Spanish speakers, a Spanish translation of the survey was also offered. The English version of the survey was given to a fluent Spanish-speaking research coordinator who forward translated it into Spanish. An ink pen was offered to each participant as nominal compensation for their time. The study was approved by the Baylor College of Medicine Institutional Review Board and the

Harris County Hospital District Office of Research. Voluntary completion of the survey was deemed an appropriate indication of consent for study participation.

Data analysis

Descriptive analyses (i.e., means, standard deviations, and frequencies) were conducted to examine demographics and respondents' beliefs about which populations of people should be HIV tested. Participants who responded to the question on HIV testing beliefs were compared with those who did not respond to this question to see if respondents to this question differed from non-respondents to this question. Comparisons were made on ethnicity, spoken English language ability, and education using chi-square tests, and when expected frequencies were small, Fisher's exact test. Responses to the question about spoken English language ability were categorized so that responses of "very well" were combined with responses of "well" to create a category of "well." Similarly, responses of "not well" were combined with responses of "not well at all" to create a category of "not well." Two-by-two chi-square tests were used to examine whether a participant's spoken English language ability was related to (1) whether one chose to complete the survey in English or Spanish, and (2) educational level. Two-by-two chi-square tests or Fisher's exact test (for spoken English ability, gender, ethnicity, and education) and independent samples *t*-tests (for age) were employed to examine whether a participant's spoken English ability or other demographic characteristics were individually associated with each of the respondents' beliefs about which populations of people should be HIV tested. Because very few participants responded with an "I'm not sure" response to the belief questions, responses for testing beliefs were rescored so that responses of both "no" and "I'm not sure" were coded as "no" (i.e., not believing that the group in question should be tested). In order to control for inflated experiment-wise error rates due to multiple comparisons, the Bonferroni correction was used, whereby tests of association between spoken English language ability and each of the nine individual beliefs about HIV testing were evaluated against a critical alpha of $p \leq 0.0056$ (i.e., $0.05/9 = 0.0056$). Finally, in order to create an overall "awareness" score, the percentage of the nine populations of people that respondents correctly believed should be HIV tested was calculated. As previously noted, all nine populations of people should be tested based on most recent HIV testing recommendations. Therefore, if a respondent selected three out of the nine populations of people they believed should be HIV tested, the respondent received an overall awareness score of 33.3%. A series of univariate linear regression models were employed to examine whether spoken English language ability or each of several demographic characteristics (i.e., gender, ethnicity, age, and education) were individually associated with overall awareness. Analyses of associations with one's overall awareness score were evaluated at an alpha of $p \leq 0.05$. Analyses involved two-sided significance testing. All analyses were conducted using SAS version 9.2 (SAS Institute, Inc., Cary, North Carolina).

Results

In this study, 200 patients were approached to participate, of which 127 (63.5%) patients completed the survey. Nineteen

TABLE 1. DEMOGRAPHIC CHARACTERISTICS FOR THE STUDY SAMPLE

Age, mean (SD) (<i>n</i> =73)	44.4 (12.3)
Gender, <i>n</i> (%) (<i>n</i> =82)	
Male	21 (25.6%)
Female	59 (72.0%)
Transgender	2 (2.4%)
Language version completed, <i>n</i> (%) (<i>n</i> =90)	
English	61 (67.8%)
Spanish	29 (32.2%)
Spoken English language ability, <i>n</i> (%) (<i>n</i> =83)	
Very well	49 (59.0%)
Well	11 (13.3%)
Not well	15 (18.1%)
Not well at all	8 (9.6%)
Ethnicity, <i>n</i> (%) (<i>n</i> =82)	
Hispanic/Latino	55 (67.1%)
Not Hispanic/Latino	27 (32.9%)
Highest level of education, <i>n</i> (%) (<i>n</i> =75)	
Some high school	24 (32.0%)
High school diploma/GED	28 (37.3%)
At least some college	23 (30.7%)

patients were later judged ineligible either due to (1) age criteria (*n*=3) or (2) because they were not at the clinic to visit their primary care provider (*n*=16). Thus, 108 patients were considered as the final study population. Notably, not all participants responded to every question. Because the focus of this study was on HIV testing beliefs, the current analyses were restricted to the 90 participants who answered the HIV testing beliefs question. The demographic characteristics of the study sample are presented in Table 1. It is important to note that the 90 participants who responded to the HIV testing beliefs question did not statistically significantly differ in ethnicity, English language ability, or education from the 18 participants who did not respond to this question (data not reported; $p > 0.05$ for all comparisons).

As anticipated, most study participants were of Hispanic/Latino ethnicity (67.1%). A majority were female (72.0%). The mean age of the participants was 44.4 years ($SD = 12.3$ years). Their education level was approximately evenly distributed among (a) those with some high school education (32.0%), (b) a high school diploma or a GED (37.3%), and (c) at least some college education (30.7%). The majority of participants (*n*=55, 67.8%) completed the survey in English. Among participants who reported their spoken English language ability (*n*=83),

there was a statistically significant association between language ability and participants' choice to complete the survey in English or Spanish ($p < 0.0001$). Of the 55 participants who completed the survey in English and reported their English language ability, 53 (96.4%) reported their spoken English language ability as "well." Of the 28 participants who completed the survey in Spanish and reported their spoken English language ability, 21 (75.0%) reported their English language ability as "not well." Additionally, there was a statistically significant association between participants' language ability and educational attainment ($p < 0.0001$). Of those who reported both their language ability and their education (*n*=68), among the 53 who reported speaking English "well," 81.1% (*n*=43) had at least a high school diploma/GED; of the 15 participants who reported their English language ability as "not well," 80.0% (*n*=12) had not obtained a high school diploma/GED.

Results pertaining to HIV testing beliefs are displayed in Table 2. Over 80% correctly believed that people who have sex for money or drugs should be tested. Over 70% were aware that people who have more than one sex partner at a time, people who have unprotected sex, men who have sex with men, people who use intravenous drugs, and women who are pregnant should be tested for HIV. However, nearly 60% of participants thought that people who have more than one sex partner in their lifetime need to be tested for HIV, and only 46.7% and 42.2% of participants were aware that all adults and all teenagers, respectively, should be tested for HIV. The mean overall awareness score (i.e., percent of the nine populations correct) was 67.7% ($SD = 33.1\%$). Thirty-percent of participants correctly identified all nine populations of people that should be tested for HIV. Approximately 9% of participants did not think that any of the populations of people should be tested for HIV. Finally, 73.3% of participants did not identify five or more of the populations of people that should be tested for HIV.

There were no significant univariate associations between the language version of the survey completed (English versus Spanish) and the nine beliefs about who should be tested for HIV (all $ps > 0.05$, data not presented). However, there were significant univariate associations between reported spoken English language ability and some beliefs about who should be tested (Table 3). Those participants who reported speaking English "well" were significantly more likely than those reporting not speaking English well to correctly believe that men who have sex with men and those that have unprotected sex should be tested for HIV (both $ps \leq 0.001$). In univariate analyses, spoken language ability was significantly associated

TABLE 2. RESPONSES TO SURVEY QUESTION, "I THINK THE FOLLOWING PEOPLE SHOULD BE TESTED FOR HIV," *n* (%)

	Yes	No	I'm not sure
People who have sex for money or drugs	76 (84.4%)	9 (10.0%)	5 (5.6%)
People who have more than 1 sex partner at a time	70 (77.8%)	13 (14.4%)	7 (7.8%)
People who have unprotected sex (sex without condoms)	70 (77.8%)	14 (15.5%)	6 (6.7%)
Men who have sex with men	69 (76.7%)	13 (14.4%)	8 (8.9%)
People who use intravenous (IV) drugs	66 (73.3%)	14 (15.6%)	10 (11.1%)
Women who are pregnant	64 (71.1%)	18 (20.0%)	8 (8.9%)
People who have more than 1 sex partner in their lifetime	53 (58.9%)	23 (25.6%)	14 (15.5%)
All adults	42 (46.7%)	35 (38.9%)	13 (14.4%)
All teenagers	38 (42.2%)	36 (40.0%)	16 (17.8%)

Sorted in descending order of frequency, *N*=90.

TABLE 3. UNIVARIATE ASSOCIATIONS BETWEEN BELIEFS ABOUT WHICH POPULATIONS SHOULD BE TESTED AND SPOKEN ENGLISH LANGUAGE ABILITY (N=83)

Awareness that the following populations should be tested for HIV	Spoken English language ability			
	Very well / well (n=60)	Not well at all/ not well (n=23)	Chi-Square	p Value
People who use intravenous drugs, n (%)	48 (80.0%)	14 (60.9%)	3.22	0.07
Women who are pregnant, n (%)	46 (76.7%)	13 (56.5%)	3.28	0.07
People who have sex for money or drugs, n (%)	56 (93.3%)	16 (69.6%)	NA ^a	0.009
Men who have sex with men, n (%)	53 (88.3%)	13 (56.5%)	10.33	0.001 ^b
People who have more than 1 sex partner at a time, n (%)	52 (86.7%)	14 (60.9%)	6.79	0.009
People who have more than 1 sex partner in their lifetime, n (%)	39 (65.0%)	13 (56.5%)	0.51	0.47
People who have unprotected sex, n (%)	53 (88.3%)	13 (56.5%)	10.33	0.001 ^b
All teenagers, n (%)	29 (48.3%)	6 (26.1%)	3.37	0.07
All adults, n (%)	31 (51.7%)	6 (26.1%)	4.40	0.04
Percentage of questions correct, Mean (SD)	Very well/ well (n=60) 75.4% (28.1%)	Not well at all/ not well (n=23) 52.2% (39.4%)	F 8.94 ^c	p Value 0.004 ^d

^aFisher's Exact Test; ^bSignificant at a Bonferroni-adjusted alpha of $p \leq 0.0056$; ^cLinear regression analysis; ^dSignificant at an alpha of $p \leq 0.05$.

with one's overall awareness score, $F(1, 81) = 8.94$, $p = 0.004$. On average, persons who reported their English language ability as "well" had higher awareness scores than persons who reported their English language ability as "not well" (75.4%, $SD = 28.1\%$ versus 52.2%, $SD = 39.4\%$, respectively). Because there was a significant association between English language ability and educational attainment, associations between reported spoken English language ability and beliefs about who should be tested were repeated in multivariate analyses controlling for education. There were 68 participants who reported their English language ability, education level, and beliefs about who should be tested for HIV. There were no associations between English language ability and beliefs about who should be tested once education was controlled in a $2 \times 2 \times 2$ chi-square analysis (all $ps > 0.05$, data not presented). There were also no associations between education and beliefs about who should be tested once English language ability was controlled (all $ps > 0.05$, data not presented). Similarly, a multiple linear regression model including education as a covariate revealed that neither language ability nor education were uniquely associated with one's overall awareness score, $F(1, 65) = 1.44$, $p = 0.23$, $F(1, 65) = 0.43$, $p = 0.51$, respectively.

There were no significant univariate associations between the participants' age, gender, ethnicity, or education and (a) knowledge about what specific populations should be tested for HIV, or (b) the overall awareness score (all $ps > 0.05$, data not presented).

Discussion

To our knowledge, this is the first study undertaken in a predominantly Hispanic/Latino-serving community health center in a high HIV prevalence area to assess if patients are aware of the latest recommendations for who should be tested for HIV. Based on the latest CDC HIV testing recommendations, because of the high HIV prevalence in Houston and in the HCHD, all of the populations of people listed in our

questionnaire should be tested for HIV. Overall, approximately one-third of our study participants were not aware that all of the populations listed in the survey should be tested for HIV. Over 70% of participants in our study did know that historical high-risk populations should be tested: those who have sex for money or drugs, men who have sex with men, and people who use IV drugs. Over 70% of participants also knew that having more than one partner at a time and having unprotected sex could be activities that should prompt HIV testing. On the other hand, having more than one sex partner in a lifetime was less of a perceived risk requiring HIV testing, with only 59% of participants thinking this would be a reason to test for HIV. Despite recommendations having been made since 1995 that women should be tested for HIV at least once in pregnancy,¹⁶ only 71% of our sample thought pregnant women should be tested. This may help explain, in part, why perinatal HIV transmission in the U.S. occurs disproportionately among racial/ethnic minority groups.¹⁷ Finally, despite 2006 recommendations for testing of all persons ages 13–64, fewer than 50% of our sample thought that all adults and teenagers should be tested for HIV. It is possible that participants felt that the populations of "all" adults and teenagers encompassed "healthy" persons and, as such, participants may have believed that only persons who look or feel sick would need to be tested. In fact, previous research has found that Hispanics and, in particular, Spanish-speakers, are less likely than non-Hispanics to know that someone with HIV/AIDS may look and feel fine.¹⁸ In a similar study conducted in a community health center serving predominantly African-American patients, over 90% of participants knew that the historical high-risk populations should be tested, nearly 80% knew that pregnant women should be tested, and over 70% thought that health adults and teenagers should be tested.¹⁹ It appears that Hispanics may be less aware of HIV testing recommendations than other high-risk racial/ethnic minority groups. Overall, our findings suggest that Hispanics are either unaware of or disagree with the recommendations for routine

HIV testing of all persons ages 13–64. Understanding patients' current beliefs about HIV testing may help explain why national testing rates among Hispanic/Latinos remain low,^{8,9} why nearly 22% of Hispanics/Latinos with HIV still remain untested and undiagnosed,¹⁰ and why HIV testing rates remain low even in community health centers implementing routine opt-out HIV testing programs.^{13,20,21} Our study suggests that Hispanics may be unaware of the current HIV epidemiologic profile in the U.S. and, therefore, unaware of the rationale for recent routine HIV testing recommendations.

Whether participants chose to complete the survey in English or Spanish did not significantly correlate with knowledge of HIV testing recommendations. However, self-reported spoken English language ability did have a significant association with knowledge of HIV testing recommendations in univariate analysis. Those who reported better spoken English language ability correctly identified more populations of people who should, in fact, be tested for HIV. In particular, while not statistically significant, those who reported speaking English well were nearly two-times as likely as those who did not speak English well to know that all adults and teenagers should be tested for HIV. Other studies have found that English language ability may be associated with HIV/AIDS knowledge and HIV testing among Hispanics/Latinos. A study on AIDS knowledge found that English speakers, compared to Spanish speakers, were more aware of AIDS-related facts.¹⁸ Another study of predominantly Mexican-born or Puerto Rican-born Hispanics found that better acculturation to the U.S. predicted higher HIV knowledge; the authors speculated that those less acculturated had fewer English language skills and, consequently, may have had less access to HIV information.²² A study on late HIV testing among Latinos in a high prevalence area found that the main predictor of late HIV testing was completion of the study interview in Spanish; the authors speculated that unfamiliarity with English was a significant obstacle to health care, and that it may have been an obstacle for obtaining earlier HIV testing.²³ It is possible that those with better English language ability are better able to understand both physician education about HIV testing recommendations and media campaigns promoting HIV testing recommendations if these sources of information are presented only in the English language. If this is the case, there may exist a communication inequality^{24,25} whereby those with limited English language ability may not benefit from communications about HIV testing—contributing to the current HIV and HIV testing disparities in Hispanic communities in the U.S.

Education did not have a significant association with knowledge of HIV testing recommendations in univariate analysis suggesting that improving access to education alone may not be sufficient to improve HIV testing knowledge among Hispanics. As might be expected, however, higher educational attainment was associated with better spoken English language ability. When both education and English language ability were included in multivariate analyses, neither was uniquely related to knowledge of HIV testing recommendations. However, nearly one-quarter of study participants were not included in the multivariate analyses due to missing data. Therefore, power to evaluate unique associations between spoken English language ability and beliefs about HIV testing was reduced.

Our study is subject to several limitations. The study required participants to have a minimal level of reading profi-

ciency in order to participate. It is possible that those with more limited reading ability did not participate, resulting in selection bias. Notably, a 2007 HCHD study on literacy found a literacy rate of 53.5% among patients whose primary speaking language was Spanish.²⁶ It is possible that the 52 participants who did not think "all adults" should be HIV tested responded this way because they were aware that the CDC recommendations state persons up to the age of 64 should be HIV tested. Our study relied on participants' self-report which may have resulted in response bias. Our survey was anonymous in an attempt to help minimize this bias. Finally, our study was conducted in one community health center in the HCHD; our results may not be generalizable to patient populations from other community health centers.

Despite the limitations of our study, our results may have important implications for improving HIV testing in health centers serving predominantly Hispanics in high HIV prevalence areas. In a 2011 national survey, 62% of Latinos surveyed wanted more information about who should get tested for HIV.⁹ Furthermore, a recent study done in the routine opt-out HIV testing era found that higher HIV knowledge was a predictor of agreement with the 2006 CDC recommendations for routine opt-out HIV testing of all persons ages 13–64.²⁷ Highlighting the importance of HIV testing for all persons—not just those from historically "high-risk" populations—could improve HIV testing among Hispanics/Latinos.

Media campaigns may be an effective intervention to improve HIV testing knowledge and HIV testing among Hispanics/Latinos. In a 2011 national survey, 57% of Latinos reported the media as their main source of HIV information.⁹ However, Hispanics in this survey also reported seeing less about HIV in the media in recent years.⁹ An earlier multi-city qualitative study of Latinos also found that Latinos wanted more information about HIV and that they could not recall any HIV-related media message specifically targeting Latinos.²⁸ Media campaigns are cost-effective²⁹ and have been shown to be successful in improving HIV testing, including in Hispanic communities.^{30–33} Importantly, Hispanics with limited English proficiency—compared to Hispanics who are more comfortable using the English language—differ in their use and trust of media sources,^{34,35} a factor that should be taken into account when developing HIV testing campaigns. Our study found that those with limited English proficiency were less likely to know about HIV testing recommendations—a result possibly related to communication inequalities. To address communication inequalities such as this, which may be contributing directly to health disparities in the HIV epidemic in the U.S., it will be important to ensure that media campaigns are presented in a language that will allow the target audience to understand, use, and act upon the information being presented.^{24,25} Spanish-language campaigns may be critical given that nearly one-third of Latinos in the U.S. are monolingual Spanish speakers.³⁶

To end the HIV disparity facing Hispanics/Latinos in the U.S., local and national HIV prevention interventions must continue. It is encouraging that in 2010 the CDC expanded their national HIV testing campaigns with Spanish-language campaigns in order to reach more people in the Hispanic/Latino community, including those who may have limited English language ability.⁶ Media campaigns do serve an informational function and are a preferred source of HIV information among Hispanics.⁹ In keeping with the call for HIV social marketing and education campaigns noted in the

National HIV/AIDS Strategy for the United States,³⁷ further research is needed on the design of effective HIV testing campaigns targeting Hispanic patients attending community health centers—health care settings often serving patients at highest risk for HIV.³⁸ Additionally, since some Hispanics may prefer HIV testing outside of formal healthcare settings—such as at home or in the community,³⁹ HIV testing campaigns also should be promoted in the community. Improving knowledge of the current HIV epidemiologic profile in the U.S. and the most recent routine HIV testing recommendations may improve HIV testing rates in Hispanic/Latino communities. Improving HIV testing among Hispanic/Latinos may impact a HIV health disparity in the U.S.

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