Published in final edited form as:

Am J Obstet Gynecol. 2010 December ; 203(6): 549.e1–549.e7. doi:10.1016/j.ajog.2010.07.033.

The Influence of Cultural Adaptation and Sexual Risk Behaviors on Cervical Cytology in a Hispanic Population

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Abstract

OBJECTIVE—To determine if the level of cultural adaptation (acculturation) of Hispanic women is associated with increased sexual risk behaviors and cervical cytological abnormalities.

METHODS—Hispanic women 18 to 55 years of age (mean = 30.5 ± 8.32) underwent routine Papanicolaou (Pap) testing and completed a comprehensive survey (N=3149). Acculturation (cultural adaptation) was measured using the Short Acculturation Scale for Hispanics. Structural equation modeling (SEM) was employed to test a mediation model.

RESULTS—Highly acculturated women engaged in a greater number of sexual risk behaviors and were more likely to have an abnormal Pap test when compared to less acculturated Hispanic women ($p < .001$).

CONCLUSION—Acculturation is related to sexual risk taking and abnormal cervical cytology. Determination of acculturation level as part of culturally competent healthcare will aid in tailoring patient communication and counseling on the prevention of cervical cancer among Hispanic women.

Keywords

Hispanic women; Pap test; acculturation; cervical cytology; sexual risk behavior

Hispanic women have one of the highest incidences of cervical cancer in the United States. The age-adjusted incidence of cervical cancer for Hispanic women is 12.7 per 100,000, which is approximately 1.5 times the overall cervical cancer incidence for all U.S. women (8.2 per 100,000).¹ As cervical cancer can be prevented by early detection and treatment, this is an alarming and unacceptable rate.

Paradoxically, while Hispanic women have a higher incidence of cervical cancer, they engage in fewer of the sexual risk behaviors that predict cervical cancer. For example, a study comparing sexual behaviors in Hispanics and non-Hispanic whites found that Hispanic women had fewer lifetime sexual partners and a lower rate of sexually transmitted infections

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A poster based on this paper's abstract was presented at the annual meeting for the Society of Behavioral Medicine in Seattle, WA on April 7–10, 2010.

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(STI).² Another study of women in New Mexico found that the incidence of human papillomavirus (HPV) infection, the causative agent of cervical cancer, was 9.7% in Hispanic women compared to 13.7% in Caucasian women.³ To attempt to understand this paradox, we need to understand the differences within the Hispanic population.

Cultural adaptation, or acculturation, describes the extent to which an individual from a non-dominant ethnic group, i.e. Hispanic, adopts aspects of the culture of the dominant ethnic group, i.e. Caucasian.^{4, 5} A highly acculturated individual is someone who has adopted many of the values, beliefs, and traditions—including language—of the dominant culture while an individual with a low level of acculturation has not, or has done so to a lesser degree. Whether high acculturation is positive or negative depends on the behavior in question. Research has shown that Hispanic women who are more highly acculturated are more likely to engage in risky sexual behaviors. Kasirye et al. found that moderately and highly acculturated Hispanic women were more likely to have multiple sexual partners than those who were less acculturated.⁶ Other studies looking at HIV risk and acculturation have found that higher acculturation predicts increased sexual risk taking behavior.^{7–9}

In the present study, we examine the relationship between sexual risk behaviors and acculturation as related to cervical cytology. We predict that acculturation mediates the relationship between sexual risk behaviors and having an abnormal Pap test result. Specifically, highly acculturated Hispanic women are more likely to have an abnormal Pap test result because they engage in more risky sexual behavior than less acculturated Hispanic women.

METHODS

Data for the present study were collected between June 1, 2006 and May 29, 2009 as part of an ongoing randomized clinical trial addressing cancer prevention. Women between 18 and 55 years of age who were patients in one of five University of Texas Medical Branch (UTMB) regional clinics in southeast Texas were screened for eligibility for the main study. Pregnant women, those currently undergoing treatment for cervical cancer, women who were under the age of 18 or over the age of 55, or women unable to understand English or Spanish were excluded from participation. During the recruitment period captured in the present study, approximately 80% of those meeting eligibility criteria agreed to participate and provided written informed consent for the study. From available refusal data, women who refused to participate did not differ by age or ethnicity ($p = .35$ and $.82$, respectively) from participants. Women were reimbursed \$5 for their time. All procedures and measures were approved by the UTMB Institutional Review Board.

Women who presented to one of the clinics for a routine visit in which it was anticipated that a Pap test would be performed were asked to complete a comprehensive survey. A total of 4582 women completed the comprehensive survey; of those, 4500 (98%) underwent Pap screening. The most common reasons for not receiving a Pap test were proximity of the visit to the previous Pap test and current heavy vaginal bleeding. In this investigation, 7 women were excluded from analysis secondary to a history of HIV infection and 89 were excluded secondary to a personal history of cervical cancer. One additional subject was excluded due to inconsistencies within her survey answers. Since this paper focused on Hispanic women, we excluded 1254 women who did not self-identify as Hispanic or indicated their country of birth as outside the United States, Mexico, or another Central American country. The final sample included 3149 women.

Each subject was asked demographic questions including age, ethnicity, birth country, marital status, education level, number of pregnancies, and number of children. Sexual

history information was obtained including age at first sexual intercourse, number of sexual partners in the past year and in her lifetime, history of an abnormal Pap test, and history of sexually transmitted infections, specifically genital warts, gonorrhea, trichomonas, chlamydia, syphilis, and herpes.

Four items from the language portion of the widely employed Short Acculturation Scale for Hispanics¹⁰ measured acculturation. The items assessed were language spoken as a child, language spoken at home, language thought in, and language spoken with friends. The reliability of the scale for our sample was = .96. The response metric ranged from *Only Spanish* (1) to *Only English* (5). These items were summed to create an acculturation score with a possible range of 4 to 20. Higher scores indicated higher levels of acculturation.

All participants underwent liquid-based Pap screening (SurePath™) and pelvic examination by a practitioner at one of the UTMB clinics. Cytology was reviewed per routine by the UTMB pathology department, with the exception of one clinic, which employed LabCorp (San Antonio, TX). All results were read as satisfactory; any result not indicating “negative for intraepithelial lesion or malignancy” was classified as abnormal. In this sample, abnormal results encompassed the following cytological classifications: abnormal squamous cells of undetermined significance, abnormal glandular cells of undetermined significance, low grade intraepithelial lesion, and high grade intraepithelial lesion. Patients were clinically managed as per UTMB guidelines.

Statistical Analysis

All preliminary data analyses were conducted using SPSS version 15.0 (Chicago, IL). In general, missing data were between 1–5% with the exception of household income, where 15% of the data were missing. Means, standard deviations, skewness, and kurtosis indices were examined for each variable. In addition, correlation coefficients and indices of reliability were computed. All subsequent analyses were conducted using structural equation modeling (SEM) and the software program Mplus version 5.1 (Los Angeles, CA). To better simulate the interaction of risk factors and psychosocial concepts, mediation modeling was used to examine the indirect effects of sexual risk behaviors (through acculturation) on cervical cytological results.

Bootstrap estimation analysis with the variance-adjusted least squares estimator (WLSM) was employed to test the mediation model. The model fit indices and Sobel tests results were examined to determine the statistical significance of the mediation paths. The fit of the model was evaluated through the examination of several fit indices: 1. Chi-Square (low value and non-significant p-value is desired), 2. the comparative fit index (CFI; values greater than .90 indicate good fit), 3. the weighted root mean square residual (WRMR; values <.90 indicate good fit), and 4. the root-mean-square residual (RMSEA; values ≤ .05 indicate good fit).

RESULTS

The mean acculturation score for the sample was 8.59 (SD = 5.76) with a range of 4 to 20, implying that, in general, the sample was less acculturated. With regard to the sexual risk factors for an abnormal Pap test, on average, women were 18.10 years old (SD = 3.67) at first sexual intercourse, reported 1.14 sex partners in the past year (SD = .670) and 2.97 lifetime sex partners (SD = 3.89). Furthermore, 15.4% had a positive STI history and 18.5% reported having an abnormal Pap test in the past. The demographic characteristics of the study sample, stratified by Pap test results, are shown in Table 1. In general, women with an abnormal Pap result were un-married, reported an annual household income less than \$10,000, were younger, and had an increased gravidity and parity.

The mediation model examined whether the number of sexual partners in the last year, age, age at first sexual intercourse, lifetime number of sexual partners, and STI history were associated with acculturation and Pap test results. This model included all of the variables as both direct and indirect predictors of Pap test results. The model fit statistics indicated good model fit. However, the number of sexual partners in the past year ($p = .052$), age at first sexual intercourse ($p = .473$), and lifetime number of sexual partners ($p = .990$) were not significantly related to Pap test results and were therefore eliminated as direct predictors of abnormal Pap test results and retained only as predictors of acculturation.

The final model included number of sexual partners in the past year, age at first sexual intercourse, and lifetime number of sexual partners as indirect predictors (through acculturation) of Pap test results and age and STI history as both indirect (through acculturation) and direct predictors of Pap test results. Table 2 presents the correlations among the predictors. . The proportion of variance (R^2) in abnormal Pap test results accounted for by the variables in the model was .06. Model fit statistics were $\chi^2(23) = 76.61$, $p\text{-value} = 0.000$; CFI = 0.999; RMSEA = 0.000; WRMR = 0.446, indicating good model fit and all of the path coefficients were statistically significant.

Figure 1 presents the full mediation model with direct path coefficients. Figure 2 presents the path coefficients for the indirect effects. Path coefficients are interpreted in the same manner as regression coefficients. For example, in Figure 1, each additional lifetime sexual partner is associated with a .32 increase in level of acculturation and each one point increase in acculturation level is associated with a .16 increased risk of abnormal Pap result. Sobel test results confirmed that acculturation mediated the relationship between number of sexual partners in the past year, age at first sexual intercourse, lifetime number of sexual partners, age, STI history and Pap test results.

COMMENTS

As hypothesized, Hispanic women who were more adapted to the American culture (more acculturated) engaged in a greater number of sexual risk behaviors and were more likely to have an abnormal Pap test when compared to women less adapted to American culture (less acculturated). Specifically, Hispanic women in our sample who reported more past year and lifetime sexual partners were more acculturated than women who reported fewer past year and lifetime sexual partners. Additionally, more acculturated Hispanic women reported having sex for the first time at a younger age than less acculturated women. While we are not aware of another study that evaluates sexual risk behaviors and acculturation among Hispanics in relation to cervical cytology, our findings are consistent with previous papers evaluating risk behaviors and acculturation in relation to HIV exposure.^{7–9}

While all of the sexual risk behaviors operated through acculturation to influence Pap results indirectly, age and STI history were also directly associated with Pap results (Figure 1). Consistent with the literature, we found that the younger Hispanic women in our sample were more highly acculturated than the older Hispanic women¹¹ and were more likely to have an abnormal Pap test result.¹² As already stated, HPV is a type of STI, and sexual risk factors that increase the risk of HPV also increase the risk of other STIs.

The disproportionately high rate of cervical cancer among Hispanic women is a complex problem that illustrates the importance of understanding and reducing racial and ethnic health care disparities. Given that less acculturated Hispanic women engage in fewer sexual risk behaviors, it seems less likely that these women would develop precancerous lesions than the general population. However, due to existing health care disparities they are also less likely to seek timely cervical cancer screening.¹³ The greatest of these disparities are

the inability to access care and cultural barriers including language. This may explain the higher incidence of cervical cancer among this group of women.

On the other hand, highly acculturated Hispanic women are more likely to engage in sexual risk behaviors that place them at higher risk for developing cervical dysplasia. However, these women are more likely to be screened and treated.⁵ While highly acculturated women of childbearing age are more likely to be screened, it cannot be assumed that this group will continue to receive regular screening as they age. Many of these women rely on Medicaid for access to care and only have coverage during portions of their reproductive years. Given that access to care becomes more difficult as this population ages, careful monitoring of screening practices is important as the median age of diagnosis for cervical cancer is 47 years of age.¹⁴

This study was a secondary analysis of baseline data from an ongoing clinical trial. We were therefore limited by the design of the original study. For example, all subjects were treated according to UTMB practice guidelines and therefore HPV samples were not collected on all patients. While sexual history is a strong predictor of HPV infection, it does not correlate absolutely with infection rates. For this investigation, only cytological results were available; future investigations could be strengthened by utilizing histological results. Additionally, we measured acculturation using a language-based measure although language use is only one facet of acculturation. However, previous research has found that measures of language acculturation distinguish very well among Hispanics with different levels of acculturation.¹⁵ Finally, our analyses were cross-sectional and correlational in nature. Future studies should examine the influence of acculturation on risk behaviors across time to determine type and incidence of HPV infection and cytological abnormalities.

There are a number of strengths of this study including a large sample size of Hispanic subjects. The multi-site conduct of the trial enabled us to sample from a large, diverse population across southeast Texas while still receiving equivocal care according to the standardized UTMB treatment guidelines established for all of the regional clinics. These clinics are designed to provide culturally competent, patient-centered health care,¹⁶ making them an ideal setting in which to develop and test interventions for this population. Further, prevention researchers are finding that it is increasingly important in prevention research to identify and target mediating variables, which indirectly influence a health outcome for intervention.¹⁷

In 2003 The Institute of Medicine (IOM), at the request of Congress, published the report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare*. In this report, the IOM determined that racial and ethnic disparities exist within the health care system. As these disparities are often associated with worse health outcomes, they were deemed unacceptable. The report included several recommendations and issued a call for more research to identify sources of health care disparities and develop intervention strategies. Emphasis was placed on increasing the level of communication and education of both the provider and the patient.¹⁸

The report emphasized focusing efforts on educating patients in order to increase access to care and participation in treatment decisions. Accordingly, the current study highlights the importance of improving both screening and follow-up in this population and suggests that creating one education or intervention program for all Hispanic women may not adequately accomplish this goal. In order to provide culturally competent care, it is critical to understand that not all Hispanic women share the same ideals. In fact, it is very likely that two women from the same ethnic group will have different cultural beliefs which influence their behavior. This was clearly demonstrated by the differences observed in the behaviors

of highly versus less acculturated women in our sample and suggests that patient education should consider acculturation level. For example, while all women need to be counseled about the need for timely Pap screening and avoidance of cervical cancer risk behaviors, a clinician may reach a less acculturated Hispanic women better by focusing more on the importance of screening and follow up whereas a more acculturated woman might benefit from a more detailed discussion on ways to decrease the risk of HPV infection.

We agree with the Institute of Medicine's recommendation that provider education in cultural competency should begin early in the educational process and continue throughout the various stages of career development. Educating health care professionals on how to quickly and easily distinguish between highly versus less acculturated Hispanic women will enable providers to deliver the most relevant health information to these women. In a clinical setting this can quickly and easily be accomplished through the administration of the brief 4-item acculturation scale with the intake survey. The development of interventions that are sensitive to the differences that exist among Hispanic women will increase screening rates and adherence to follow-up among women with abnormal Pap test results and will ultimately decrease the incidence of cervical cancer.

Acknowledgments

Drs. Ward and Roncancio are Kirschstein-NRSA postdoctoral fellows supported by an institutional training grant (T32HD055163) from the Eunice Kennedy Shriver National Institute of Child Health & Human Development. Dr. Abbey B. Berenson is the principal investigator of the above-mentioned grant. Dr. Bretkopf is supported by R01CA107015. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Eunice Kennedy Shriver National Institute of Child Health & Human Development or the National Institutes of Health.

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Figure 1.

Full Mediation Model. (N=3149) The arrows from age and history of STI to abnormal Pap test result represent direct effects. Age, sexual partners in the last year, age at first sexual intercourse, lifetime number of sexual partners, and history of STI are associated with abnormal Pap test results indirectly through acculturation. All path coefficients above are statistically significant (** $p < .001$).

Figure 2. Mediation Model- Indirect Effects. (N=3149) Age, sexual partners in the last year, age at first sexual intercourse, lifetime number of sexual partners, and history of STI are associated with abnormal Pap test results indirectly through acculturation. All path coefficients were significant (** $p < .001$; * $p < .05$).

Table 1

Sample Demographics by Pap Result (N=3149)

Demographic Characteristic	Normal Pap	Abnormal Pap	Total	p-value
	2935 (93.2%)	214 (6.8%)		
Marital Status				<.001
Single, Never Married	797 (26.0%)	110 (3.6 %)	907 (29.6%)	
Married	1549 (50.5 %)	57 (1.9 %)	1606(52.4%)	
Divorced	182 (5.9%)	14 (0.5 %)	196 (6.4 %)	
Separated	304 (9.9 %)	27 (0.9%)	331 (10.8 %)	
Widowed	23 (0.8 %)	3 (0.1%)	26 (0.8%)	
Education Level				.168
High School	2273 (73.1%)	157 (5.1 %)	2430 (78.2%)	
> High School	624 (20.1%)	54 (1.7%)	678 (21.8 %)	
Annual household income				.066
< \$10,000	764 (29.7%)	68 (2.6 %)	832 (32.3%)	
≥ \$10,000	1636 (63.5%)	108 (4.2%)	1744 (67.7%)	
Age (y)				
Mean (±SD)	30.70 (±8.3)	28.22 (±7.8)	30.53 (±8.3)	<.001
Gravidity				<.001
0	208 (6.6%)	31 (1.0%)	239 (7.6%)	
1–5	2467 (78.3%)	172 (5.5%)	2639 (83.8%)	
>5	260 (8.3%)	11 (0.3%)	271 (8.6%)	
Parity				<.001
0	244 (7.7%)	36 (1.1%)	280 (8.9%)	
1–5	2589 (82.2%)	174 (5.5%)	2763 (87.7%)	
>5	102 (3.2%)	4 (0.1%)	106 (3.4%)	

Frequencies that do not sum to the total indicate missing data.

Table 2

Correlations among Predictor Variables (N=3149)

	1	2	3	4	5
1. Number of Sexual Partners in Past Year	—				
2. Age at first sexual intercourse	-.16	—			
3. Lifetime Number of Sexual Partners	.36	-.28	—		
4. Age	-.13	.28	-.02	—	
5. STI History	.13	-.20	.25	-.10	—

All values significant $p<.05$

Table 3

Sobel Test Results (Mediation Effects) for the Final Structural Model (N=3149)

Indirect Effect	Std Path Coefficient	SE	Z	p- value
Age→Acculturation→Abnormal Pap Test Result	-.015	.004	-3.58	<.001
Sexual Partners in the Last Year →Acculturation→ Abnormal Pap Test Result	.010	.004	2.70	.023
Age at First Sexual Intercourse→Acculturation→ Abnormal Pap Test Result	-.034	.008	-4.46	<.001
Lifetime Number of Sexual Partners →Acculturation→ Abnormal Pap Test Result	.049	.012	4.18	<.001
History of STI →Acculturation→ Abnormal Pap Test Result	.019	.005	3.76	<.001

This table presents the mediation (indirect) effects. Age, sexual partners in the last year, age at first sexual intercourse, lifetime number of sexual partners, and history of STI are associated with abnormal Pap test results indirectly through acculturation.