Relationship Between Acculturation, Discrimination, and Suicidal Ideation and Attempts Among US Hispanics in the National Epidemiologic Survey of Alcohol and Related Conditions

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ABSTRACT

Objective: Acculturation is the process by which immigrants acquire the culture of the dominant society. Little is known about the relationship between acculturation and suicidal ideation and attempts among US Hispanics. Our aim was to examine the impact of 5 acculturation measures (age at migration, time in the United States, social network composition, language, race/ethnic orientation) on suicidal ideation and attempts in the largest available nationally representative sample of US Hispanics.

Method: Study participants were US Hispanics (N = 6,359) from Wave 2 of the 2004–2005 National Epidemiologic Survey of Alcohol and Related Conditions (N = 34,653). We used linear χ^2 tests and logistic regression models to analyze the association between acculturation and risk of suicidal ideation and attempts.

Results: Factors associated with a linear increase in lifetime risk for suicidal ideation and attempts were (1) younger age at migration (linear $\chi^2_1 = 57.15$; $P < .0001$), (2) longer time in the United States (linear $\chi^2_1 = 36.09$; $P < .0001$), (3) higher degree of English-language orientation (linear $\chi^2_1 = 74.08$; $P < .0001$), (4) lower Hispanic composition of social network (linear $\chi^2_1 = 36.34$; $P < .0001$), and (5) lower Hispanic racial/ethnic identification (linear $\chi^2_1 = 47.77$; $P < .0001$). Higher levels of perceived discrimination were associated with higher lifetime risk for suicidal ideation ($\beta = 0.051$; $P < .001$) and attempts ($\beta = 0.020$; $P = .003$).

Conclusions: There was a linear association between multiple dimensions of acculturation and lifetime suicidal ideation and attempts. Discrimination was also associated with lifetime risk for suicidal ideation and attempts. Our results highlight protective aspects of the traditional Hispanic culture, such as high social support, coping strategies, and moral objections to suicide, which are modifiable factors and potential targets for public health interventions aimed at decreasing suicide risk. Culturally sensitive mental health resources need to be made more available to decrease discrimination and stigma.

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The prediction and prevention of suicide, which causes 1 million deaths per year,[1–3] are hampered by the scarcity of data on suicidal ideation and attempts among minorities such as Hispanics.[4,5] Although Hispanics are the largest and fastest-growing minority in the United States,[6–11] few studies have examined the relationship between acculturation and suicidal ideation and attempts among US Hispanics.[10,12]

Acculturation, the "acquisition of the cultural elements of the dominant society,"[13] is a multidimensional construct including multiple facets such as nativity, language orientation, social network preferences, and ethnic identity.[10] Several mechanisms may mediate the relationship between acculturation and suicide, including a protective effect of the traditional Hispanic culture,[10,14] higher exposure to drugs of abuse among more acculturated individuals,[15] and the acculturative stress associated with immigration and acculturation to the US culture.[10,16,17] Among Hispanics, acculturation to the US culture has been associated with increased psychopathology and substance use,[18–21] which are associated with increased risk for suicidal behaviors.[22,23] The few studies examining the effect of acculturation on suicidal ideation and attempts in US Hispanics have generally found that higher levels of acculturation are associated with increased risk for suicidal ideation and attempts.[10,12,24] These studies present several limitations, such as using non–nationally representative adolescent and/or school-based samples and focusing on only a few measures of acculturation, such as foreign versus US nativity status,[10,12,16,17,24,25] age at migration and/or generational status,[12,16,17,26] time in the United States,[10,24,25,27–29] or familism.[29] The paucity of studies on the relationship between suicide attempts and multidimensional measures of acculturation may be due to the lack of multifaceted acculturation assessments in most large psychiatric epidemiologic surveys.[10]

This study is innovative in that its aim was to extend existing knowledge[10,12,16,24,25,27–29] by (1) examining the association between multiple facets of acculturation and the lifetime risk for suicidal ideation and attempts in a nationally representative sample of US Hispanics and (2) explicitly hypothesizing a dose-related association of level of acculturation across multiple dimensions and risk of suicidal ideation and attempts, such that higher levels of acculturation will be associated with higher rates of suicidal ideation and attempts.

METHOD

Sample

The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) is a nationally representative survey of the adult US population of households and group quarters, including noncitizens and nonresidents.[30,31] The sampling frame for the

Clinical Points

- Among Hispanics living in the United States, higher levels of acculturation and discrimination on the basis of race/ethnicity are associated with increased risk for lifetime suicidal ideation and attempts.
- Protective aspects of the traditional Hispanic culture, such as high social support, coping strategies, and moral objections to suicide, are modifiable factors and potential targets for public health interventions aimed at decreasing suicide risk.
- Culturally sensitive mental health resources (in Spanish, and taking into account cultural attitudes and feelings toward mental illness) should be made more widely available to decrease the discrimination and stigma associated with Spanish language and Hispanic ethnic identity.

NESARC sample of housing units is the Census 2000/2001 Supplementary Survey (C2SS), a national survey of 78,300 households per month. A group quarters frame was also used. Stage 1 was primary sampling unit (PSU) selection using the C2SS PSUs. Stage 2 was household selection from the sampled PSUs. In Stage 3, 1 sample person was selected from each household. Face-to-face interviews in English and Spanish were conducted by trained interviewers of the US Census Bureau.

In NESARC Wave 1 (2001–2002), 43,093 individuals were assessed. The Wave 2 (2004–2005; N = 34,653) response rate was 86.7% overall and 73.3% among Hispanics. The Wave 2 NESARC weights include a component that adjusts for nonresponse, for sociodemographic factors, and for psychiatric diagnoses, to ensure that the sample approximates the target population, that is, the original sample minus attrition between the 2 waves. As previously reported, in order to test whether this nonresponse adjustment was successful, Wave 2 respondents were compared with the target population (comprising Wave 2 respondents and eligible nonrespondents) in terms of a number of baseline (Wave 1) sociodemographic and diagnostic measures. The resulting comparison indicated that there were no significant differences between the Wave 2 respondents and the target population on age, race/ethnicity, sex, socioeconomic status, or the presence of any lifetime substance, mood, anxiety, or personality disorders.[31] Cases with missing data were excluded from the analyses (less than 1% of the sample), resulting in the present sample of 6,359 Hispanics who participated in both Wave 1 and Wave 2. Complete measures of ethnic identity and linguistic and social preferences were assessed among this subset. The variables regarding ethnic identity and linguistic social preferences were derived from the Wave 2 of the NESARC.

Measures

Lifetime suicidal ideation and attempts. As part of the diagnostic assessment, all NESARC respondents were asked whether they had ever, in their entire life, felt sad, blue, depressed, or down or didn't care about things or enjoy things for at least 2 weeks. Those who answered "yes" screened into the depression section of the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule–*DSM-IV* Version (AUDADIS-IV)[32] and were asked the following questions about suicidal ideation and behavior they may have ever had when they felt sad, blue, depressed, or down/didn't care about things or enjoy things: (1) "Did you attempt suicide?" (we used this question to assess lifetime history of suicide attempt) and (2) "Did you think about committing suicide?" (we used this question to assess lifetime history of suicidal ideation). Responses were coded as either "yes" or "no" separately for those 2 questions. Of note, the proportion of individuals who do not screen into the depression section and report a suicide attempt is very low (< 0.1%).[33]

Sociodemographic variables. Sex, age, income, education, employment and marital status, and insurance were recorded for all participants.

Hispanic subgroups. We subdivided Hispanics into 3 subgroups: Mexican origin, Puerto Rican origin, and an "other Hispanics" category into which the remaining Hispanic participants were grouped due to small sample sizes.

Dimensions of acculturation. Five complementary dimensions were evaluated.

- Age at migration was categorized in 3 groups following Fortuna et al[10]: age ≤ 17 years; age 18 to 24 years; and age 25 years or older; for the reference group (US-born), age at migration was coded as 0.
- Time spent in the United States was categorized in 3 groups according to the number of years spent in the United States: ≤ 13 years, 14–24 years, and 25 years or more, with US-born participants as the reference group.
- Language orientation preferences (categorized as mostly or completely Spanish; both, but more Spanish; both, but more English; and mostly or completely English) were measured with 7 items from the language orientation subscale of the Short Acculturation Scale,[34] which had excellent internal consistency in this sample (Cronbach α = 0.93). Some examples of these items included "What languages do you read and speak?" and "In what language do you speak with friends?"
- Social network composition (categorized as mostly all Hispanic; both, but more Hispanic; both, but less Hispanic; mostly or all other ethnic groups) was measured with the 4-item Ethnic Social Relations subscale of the Short Acculturation Scale,[34] which yielded a Cronbach α of 0.78. Those items queried about the ethnicity of the respondent's close friends, that of the persons whom the respondents visited or preferences for the ethnicity of the friends of the respondent's children.
- Ethnic identity was measured with 8 items using an expansion of the 3-item Ethnic Identity Scale from the National Comorbidity Survey-Replication and the National Latino and Asian American Study.[35] Examples of items include "Have a strong sense of

yourself as a person of Hispanic/Latino origin" and "Hispanic/Latino heritage is important in your life." All items were Likert scales with response options ranging from "strongly agree" to "strongly disagree." After appropriate items were reverse coded, higher scores indicate stronger identity with Hispanic heritage, whereas lower scores indicate weaker identity with Hispanic heritage. Internal consistency was excellent in this sample (Cronbach α = 0.90).

All 5 domains of acculturation were significantly correlated at the $P < .01$ level. The highest correlation was between ethnic identity and linguistic/social preferences (correlation coefficient = 0.69, $P < .01$), and the lowest was between language/social preference and years in the United States (correlation coefficient = −0.23, $P < .01$).

Statistical analyses. Prevalence and standard errors for suicidal ideation and attempts were computed among individuals with different levels of acculturation across different measures (eg, age at migration). Odds ratios (ORs) and 95% confidence intervals (CIs) derived from logistic regression models were used to examine whether the lifetime prevalence of suicidal ideation and attempts changed depending on level of acculturation across different measures. Each acculturation variable was tested separately to avoid multicollinearity and show the consistency of results across several measures of acculturation. Adjusted odds ratios (AORs) controlled for all sociodemographic characteristics. ORs and AORs were considered significant when their confidence interval did not include 1. Linear χ^2 tests were used to test for dose-related associations of acculturation and suicidal ideation and attempts. Due to the nonnormal distribution of the acculturation variables, the total scores were categorized by quartiles for all analyses.[36]

To further address the high correlation among acculturation variables and avoid multicollinearity, we repeated the logistic regressions using a Composite Acculturation measure, with higher scores indicating greater levels of acculturation, combining measures of language, social network preference, and ethnic identity from the Short Acculturation Scale[34] and the 8-item expansion of the Ethnic Identity Scale.[35] Cronbach α for this Composite Acculturation variable was 0.95. We also added the variables country of origin, language, and age at migration to these models and assessed for interaction effects (country of origin × acculturation, gender × acculturation) on risk for lifetime suicidal ideation and attempt. To assess the role of potential mediators of the relationship between acculturation and risk for suicidal ideation and attempts, we also included variables of religion (attendance to religious services, yes/no), social networks (Social Network Index[37] score), and perceived discrimination on the basis of race/ethnicity.

The multistage sampling strategy was accounted for when modeling the data using SUDAAN (RTI International; Research Triangle Park, North Carolina), a statistical software package that is suitable for analyses of studies with complex survey designs.

RESULTS

Among the Hispanic subsample used for the present study (N = 6,359), 50.9% were male; 24.9% were 20–29 years old; 40.1% were 30–44 years old, 25.4% were 45–64 years old, and 9.6% were 65 and older; 20.4% were married or living with someone as if married; and 84% lived in an urban area. Among the Hispanic sample, 34.8% reported less than a high school education, and 24.4% reported high school education; 51.0% reported past-year personal income below $19,999, whereas 25.7% reported $20,000–$34,999, 18.0% reported $35,000–$69,999, and 5.3% reported at least $70,000; and 72.0% reported having some form of current health insurance.

Sociodemographic Characteristics and Suicidal Ideation

Table 1 summarizes the relationship between sociodemographic characteristics and country of origin and suicidal ideation. The following factors significantly increased the odds of lifetime suicidal ideation: Puerto Rican origin, female sex, age between 18–29 years, having a college education, income below $20,000, being unemployed, having never married, being widowed or divorced, and having public insurance.

Sociodemographic Characteristics and Suicide Attempts

Table 2 summarizes the relationship between sociodemographic characteristics and suicide attempts. Consistent with the literature,[4,7] Puerto Ricans had significantly higher lifetime rates of suicide attempt than Mexicans. The following factors significantly increased the odds of lifetime suicide attempt: female sex, age between 18–29 years, income below $20,000, being unemployed, having never married, being widowed or divorced, and having public insurance.

Association of Acculturation and Lifetime Suicidal Ideation

A significant linear relationship was found between higher risk for suicidal ideation and all dimensions of increased acculturation, including longer time spent in the United States, younger age at migration, lower degree of Spanish-language orientation, lower Hispanic/Latino composition of social network, and lower Hispanic/Latino ethnic identification (Table 3). All of these associations remained statistically significant after adjusting for sociodemographic characteristics.

Association of Acculturation and Lifetime Suicide Attempts

A significant linear relationship was found between higher risk for suicide attempts and measures of increased acculturation (Table 4), including younger age at migration, lower Spanish-language orientation, lower Hispanic/Latino social network, and lower Hispanic/Latino

Table 1. Risk of Lifetime Suicidal Ideation by Nativity, Country of Origin, and Sociodemographic Characteristics Among Hispanics in Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (N = 6,359)

	Lifetime Suicidal Ideation (n = 582; 7.93%)		No Suicidal Ideation (n = 5,777; 92.07%)		OR for Lifetime Suicidal Ideation	
	%[a]	SE	%[a]	SE	OR[b]	95% CI
Nativity						
US-born (ref)	11.68	0.92	88.32	0.92		
Foreign-born	4.89	0.43	95.11	0.43	*0.39*	*0.31–0.49*
Country of origin[c]						
Mexican (ref)	6.97	0.69	93.03	0.69		
Puerto Rican	14.12	1.95	85.88	1.95	*2.19*	*1.49–3.24*
Other Hispanic	7.57	0.88	92.43	0.88	1.09	0.79–1.52
Sex						
Male	6.20	0.66	93.80	0.66	*0.61*	*0.47–0.80*
Female	9.71	0.83	90.29	0.83		
Age						
18–29 y (ref)	9.88	1.17	90.12	1.17		
30–44 y	7.15	0.74	92.85	0.74	*0.70*	*0.52–0.95*
45–64 y	8.51	0.84	91.49	0.84	0.85	0.64–1.13
65+ y	4.57	0.90	95.43	0.90	*0.44*	*0.27–0.71*
Education						
Less than high school	5.93	0.65	94.07	0.65	*0.55*	*0.41–0.74*
High school	6.86	0.87	93.14	0.87	*0.64*	*0.47–0.88*
College (ref)	10.26	0.95	89.74	0.95		
Individual income						
$0–$19,000 (ref)	9.12	0.94	90.88	0.94		
$20,000–$34,999	7.11	0.86	92.89	0.86	0.76	0.57–1.01
$35,000–$69,999	5.97	0.84	94.03	0.84	*0.63*	*0.43–0.93*
≥ $70,000	7.10	1.93	92.90	1.93	0.76	0.38–1.52
Employment status						
Employed (ref)	6.66	0.54	93.34	0.54		
Unemployed	11.04	1.07	88.96	1.07	*1.74*	*1.38–2.19*
Marital status						
Married (ref)	5.80	0.46	94.20	0.46		
Widowed/ divorced	13.01	1.49	86.99	1.49	*2.43*	*1.82–3.24*
Never married	11.15	1.40	88.85	1.40	*2.04*	*1.56–2.67*
Insurance						
Private (ref)	7.56	0.54	92.44	0.54		
Public	11.48	1.39	88.52	1.39	*1.59*	*1.21–2.07*
No insurance	6.85	0.96	93.15	0.96	0.90	0.67–1.20

[a]Prevalences are row percentages.
[b]Significant ORs and CIs are in italics.
[c]Mexican and Mexican-American are counted as Mexican origin, and Hispanic people with origin other than Mexican, Mexican-American, and Puerto Rican are counted as other Hispanic.
Abbreviations: CI = confidence interval, OR = odds ratio, ref = reference category.

Table 2. Risk of Lifetime Suicide Attempt by Nativity, Country of Origin, and Sociodemographic Characteristics Among Hispanics in Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (N = 6,359)

	Lifetime Suicide Attempt (n = 213; 2.85%)		No Suicide Attempt (n = 6,146; 97.15%)		OR for Lifetime Suicide Attempt	
	%[a]	SE	%[a]	SE	OR[b]	95% CI
Nativity						
US-born (ref)	3.52	0.43	96.48	0.43		
Foreign-born	2.31	0.25	97.69	0.25	*0.65*	*0.47–0.89*
Country of origin[c]						
Mexican (ref)	2.82	0.38	97.18	0.38		
Puerto Rican	5.29	0.68	94.71	0.68	*1.92*	*1.31–2.81*
Other Hispanic	2.23	0.38	97.77	0.38	0.79	0.49–1.25
Sex						
Male	1.84	0.31	98.16	0.31	*0.46*	*0.29–0.74*
Female	3.89	0.49	96.11	0.49		
Age						
18–29 y (ref)	3.89	0.70	96.11	0.70		
30–44 y	2.23	0.36	97.77	0.36	*0.56*	*0.33–0.95*
45–64 y	3.40	0.47	96.60	0.47	0.87	0.55–1.36
65+ y	1.28	0.36	98.72	0.36	*0.32*	*0.16–0.65*
Education						
Less than high school	2.72	0.35	97.28	0.35	0.86	0.59–1.26
High school	2.53	0.50	97.47	0.50	0.80	0.51–1.26
College (ref)	3.15	0.44	96.85	0.44		
Individual income						
$0–$19,000 (ref)	3.65	0.41	96.35	0.41		
$20,000–$34,999	2.38	0.47	97.62	0.47	0.64	0.42–1.00
$35,000–$69,999	1.19	0.34	98.81	0.34	*0.32*	*0.16–0.62*
≥ $70,000	3.06	1.64	96.94	1.64	0.83	0.27–2.56
Employment status						
Employed (ref)	1.99	0.24	98.01	0.24		
Unemployed	4.97	0.56	95.03	0.56	*2.58*	*1.87–3.56*
Marital status						
Married (ref)	2.19	0.31	97.81	0.31		
Widowed/ divorced	4.94	0.75	95.06	0.75	*2.33*	*1.50–3.60*
Never married	3.50	0.49	96.50	0.49	*1.62*	*1.10–2.40*
Insurance						
Private (ref)	2.36	0.32	97.64	0.32		
Public	5.43	0.73	94.57	0.73	*2.38*	*1.61–3.52*
No insurance	2.56	0.47	97.44	0.47	1.09	0.68–1.74

[a]Prevalences are row percentages.
[b]Significant ORs and CIs are in italics.
[c]Mexican and Mexican-American are counted as Mexican origin, and Hispanic people with origin other than Mexican, Mexican-American, and Puerto Rican are counted as other Hispanic.
Abbreviations: CI = confidence interval, OR = odds ratio, ref = reference category.

ethnic identification. All of these associations remained statistically significant after adjusting for sociodemographic characteristics. Longer time spent in the United States was also associated with higher risk for suicide attempts, but this association was no longer significant after adjusting for sociodemographic characteristics.

Analyses Using the Composite Acculturation Measure

The results regarding the effect of acculturation on suicidal ideation and attempts remain unchanged after using the Composite Acculturation measure and controlling for language, age at migration, country of origin, gender, attendance to religious services, social network size, and reported discrimination.

We found that, as previously reported,[5] country of origin was significantly associated with risk for lifetime suicidal ideation and attempts. Specifically, we found that being Puerto Rican (vs the reference category, being Mexican) conferred higher risk for lifetime suicidal ideation ($\beta = 0.058$, $P = .007$) and attempts ($\beta = 0.021$, $P = .010$) even after controlling for level of acculturation, age at migration, and gender.

We found no evidence of an interaction between acculturation and country of origin on risk for suicidal ideation. For risk for suicide attempts, we found evidence of an interaction between acculturation and country of origin only for Puerto Ricans ($\beta = -0.031$, $P = .034$), suggesting that the effect of acculturation on risk for suicide attempts was smaller among Puerto Ricans than among Hispanics from

Table 3. Risk of Lifetime Suicidal Ideation by Level of Acculturation Among Hispanics in Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (N = 6,359)

	Lifetime Suicidal Ideation (n = 582; 7.93%)		Odds Ratio for Lifetime Suicidal Ideation		Linear Trend Test		AOR for Lifetime Suicidal Ideation		Linear Trend Test	
	%	95% CI	OR	95% CI	χ^2_1	*P* Value[a]	AOR[b]	95% CI	χ^2_1	*P* Value[a]
Time spent in the United States[c]										
≤ 13 y	3.50	2.33–5.24	0.27	0.18–0.43	36.09	*<.0001*	0.31	0.19–0.50	26.51	*<.0001*
14–24 y	4.68	3.48–6.26	0.37	0.26–0.52			0.42	0.29–0.61		
≥ 25 y	6.72	5.25–8.56	0.54	0.41–0.73			0.65	0.48–0.89		
US-born (ref)	11.68	9.97–13.64								
Age at migration[c]										
≥ 25 y	3.63	2.52–5.20	0.28	0.20–0.41	57.15	*<.0001*	0.31	0.21–0.46	43.78	*<.0001*
18–24 y	3.30	2.32–4.68	0.26	0.17–0.39			0.30	0.19–0.47		
≤ 17 y	7.41	5.76–9.49	0.61	0.44–0.83			0.67	0.48–0.93		
US-born (ref)	11.68	9.97–13.64								
Language orientation[c]										
First quartile (mostly or completely Spanish) (< 1.60)	3.56	2.58–4.89	0.22	0.15–0.32	74.08	*<.0001*	0.19	0.12–0.30	56.05	*<.0001*
Second quartile (both, but more Spanish) (1.60 to < 2.95)	5.13	3.96–6.63	0.32	0.24–0.44			0.32	0.23–0.45		
Third quartile (both, but more English) (2.95 to < 4.25)	8.03	6.41–10.02	0.52	0.39–0.70			0.49	0.36–0.66		
Fourth quartile (mostly or completely English) (≥ 4.25) (ref)	14.33	12.19–16.77								
Social network[c]										
First quartile (mostly or all Hispanic/Latino) (< 1.86)	4.28	2.91–6.24	0.33	0.21–0.51	36.34	*<.0001*	0.33	0.20–0.54	27.36	*<.0001*
Second quartile (both, but more Hispanic/Latino) (1.86 to < 2.67)	4.83	3.83–6.06	0.37	0.28–0.50			0.38	0.28–0.53		
Third quartile (both, but less Hispanic/Latino) (2.67 to < 3.05)	10.50	8.46–12.96	0.86	0.65–1.15			0.88	0.66–1.17		
Fourth quartile (mostly or all other ethnic groups) (≥ 3.05) (ref)	11.98	10.02–14.27								
Ethnic identity[c]										
First quartile (strong Hispanic/Latino identification) (< 1.34)	4.71	3.41–6.47	0.34	0.24–0.48	47.77	*<.0001*	0.35	0.23–0.51	36.96	*<.0001*
Second quartile (middle-high Hispanic/Latino identification) (1.34 to < 1.90)	5.72	4.55–7.17	0.41	0.31–0.55			0.43	0.32–0.56		
Third quartile (middle-low Hispanic/Latino identification) (1.90 to < 2.59)	8.21	6.69–10.02	0.61	0.46–0.81			0.64	0.46–0.87		
Fourth quartile (weak Hispanic/Latino identification) (≥ 2.59) (ref)	12.80	10.71–15.23								

[a]Significant *P* values are in italics.
[b]Adjusted odds ratio controlled for sociodemographic characteristics (sex, age, education, individual income, employment status, marital status, insurance).
[c]Each acculturation measure is included in a separate logistic regression model.
Abbreviations: AOR = adjusted odds ratio, CI = confidence interval, OR = odds ratio, ref = reference category.

other countries. We found no evidence of an interaction between acculturation and gender on risk for suicidal ideation or attempts.

We found that higher levels of perceived discrimination significantly increased the risk for suicidal ideation (β = 0.051; *P* < .001) and attempts (β = 0.020; *P* = .003). By contrast, attendance to religious services or size of the social network had no effect on risk for lifetime suicidal ideation and attempts.

DISCUSSION

In the largest nationally representative sample of US Hispanics available to date, there was a positive, dose-related association between higher level of acculturation and increased risk for suicidal ideation and attempts. This association was manifest across multiple dimensions of acculturation, including age at migration, time spent in the United States, language orientation, predominance of Hispanic social network and degree of Hispanic/Latino ethnic identification, even after adjusting for a broad range of sociodemographic characteristics.

Acculturation and Suicidal Ideation and Attempts Among Hispanics

Acculturation has been shown to modulate the risk of suicidal ideation and attempts among Hispanics, with higher levels of acculturation associated with increased risk for suicidal ideation and attempts.[10] Only 3 studies[10,12,24] have examined acculturation and risk for suicidal behavior among US Hispanics on adult nationally representative samples including all Hispanic groups. Fortuna et al[10] found that current English proficiency, English language spoken as a child, and parental US nativity were risk factors for suicidal ideation and attempts. Ungemack and Guarnaccia[24] found that use of English language for the interview and US nativity were associated with increased lifetime risk for suicidal ideation but not for attempts in some Hispanic subgroups. Borges et al[12] found that US nativity and lower age at

Table 4. Risk of Lifetime Suicide Attempts by Level of Acculturation Among Hispanics in Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (N = 6,359)

	Lifetime Suicide Attempt (n = 213; 2.85%)		Odds Ratio for Lifetime Suicide Attempt		Linear Trend Test		AOR for Lifetime Suicide Attempt		Linear Trend Test	
	%	95% CI	OR	95% CI	χ^2_1	*P* Value[a]	AOR[b]	95% CI	χ^2_1	*P* Value[a]
Time spent in the United States[c]										
≤ 13 y	2.11	1.24–3.59	0.59	0.32–1.08	4.27	*.0389*	0.65	0.34–1.24	2.46	.1166
14–24 y	2.09	1.24–3.51	0.59	0.34–1.00			0.67	0.36–1.23		
≥ 25 y	2.79	1.99–3.89	0.79	0.51–1.22			0.90	0.54–1.50		
US-born (ref)	3.52	2.76–4.48								
Age at migration[c]										
≥ 25 y	2.06	1.27–3.32	0.58	0.36–0.93	9.09	*.0026*	0.63	0.34–1.18	4.38	*.0364*
18–24 y	1.43	0.78–2.60	0.40	0.20–0.77			0.43	0.21–0.87		
≤ 17 y	3.27	2.31–4.62	0.93	0.59–1.46			1.00	0.64–1.56		
US-born (ref)	3.52	2.76–4.48								
Language orientation[c]										
First quartile (mostly or completely Spanish) (< 1.60)	2.03	1.36–3.03	0.54	0.33–0.87	7.42	*.0064*	0.45	0.24–0.87	5.99	*.0144*
Second quartile (both, but more Spanish) (1.60 to < 2.95)	2.48	1.73–3.54	0.66	0.40–1.08			0.67	0.42–1.08		
Third quartile (both, but more English) (2.95 to < 4.25)	3.10	2.20–4.36	0.83	0.53–1.30			0.79	0.51–1.23		
Fourth quartile (mostly or completely English) (≥ 4.25) (ref)	3.72	2.74–5.04								
Social network[c]										
First quartile (mostly or all Hispanic/Latino) (< 1.86)	2.01	1.34–3.00	0.49	0.29–0.84	10.25	*.0014*	0.41	0.25–0.70	14.68	*.0001*
Second quartile (both, but more Hispanic/Latino) (1.86 to < 2.67)	1.94	1.41–2.65	0.48	0.30–0.76			0.45	0.28–0.72		
Third quartile (both, but less Hispanic/Latino) (2.67 to < 3.05)	3.45	2.50–4.74	0.86	0.55–1.35			0.86	0.56–1.32		
Fourth quartile (mostly or all other ethnic groups) (≥ 3.05) (ref)	3.99	2.86–5.54								
Ethnic identity[c]										
First quartile (strong Hispanic/Latino identification) (< 1.34)	1.77	1.20–2.61	0.42	0.26–0.68	14.61	*.0001*	0.37	0.22–0.61	18.41	*<.0001*
Second quartile (middle-high Hispanic/Latino identification) (1.34 to < 1.90)	2.19	1.49–3.21	0.53	0.32–0.86			0.50	0.31–0.82		
Third quartile (middle-low Hispanic/Latino identification) (1.90 to < 2.59)	3.28	2.40–4.48	0.80	0.51–1.25			0.79	0.49–1.26		
Fourth quartile (weak Hispanic/Latino identification) (≥ 2.59) (ref)	4.08	3.00–5.54								

[a]Significant *P* values are in italics.
[b]Adjusted odds ratio controlled for sociodemographic characteristics (sex, age, education, individual income, employment status, marital status, insurance).
[c]Each acculturation measure is included in a separate logistic regression model.
Abbreviations: AOR = adjusted odds ratio, CI = confidence interval, OR = odds ratio, ref = reference category.

migration were associated with increased risk for lifetime suicidal ideation and attempts. We confirmed and extended these results by showing a dose-response relationship between multiple dimensional measures of acculturation and risk of suicidal ideation and attempt in a larger nationally representative sample of US Hispanics. Some facets of acculturation may mediate the effect of other facets. For example, age at migration may have an impact on language proficiency, which in turn may have an impact on social network composition and ethnic/racial identification.

Part of the interest in acculturation arises from the fact that recently arrived immigrants, despite their socioeconomic disadvantages, lack of education, and difficulties accessing health care, have lower prevalence of psychiatric disorders than more acculturated Hispanics living in the United States (the "immigrant paradox").[15,17,38] Two main theories have been posited to explain this "immigrant paradox."[17] The first theory, often called the "healthy immigrant effect," postulates the selective migration of relatively healthy individuals or the selective return of sick migrants to their country of origin.[39] The second, the acculturation theory, hypothesizes that cultural assimilation into the US culture has a negative effect on mental health and suicidal ideation and attempts.[10,17] The results of the present study strongly support the acculturation theory, with a dose-related association of acculturation and risk for suicidal ideation and attempts. For example, if the "healthy immigrant effect" were true, it would be difficult to explain why the less healthy individuals would immigrate at a younger age, while the healthier ones would tend to immigrate at progressively older ages.

Several mechanisms have been postulated as mediators of the association between acculturation and suicidal ideation and attempts among Hispanics living in the United States: (1) a protective effect of the traditional Hispanic culture (eg, extended kin networks common among Hispanic families, religion and other social supports, coping strategies, and moral objections to suicide),[10,14] (2) environmental factors such as lower availability of and exposure to drugs of abuse among less acculturated individuals,[15] and (3) acculturative stress, including social stressors related to migration and acculturation to the US culture, such as family disintegration, isolation, discrimination,[17] and tensions in cultural values

(eg, intergenerational conflict, retention or loss of Spanish language).[10,16] Although some studies have found that more recent immigrants have higher levels of acculturative stress than second-generation immigrants, other studies have observed that some elements of Hispanic culture such as increased family support (ie, familism) act as "buffers" that may protect recent immigrants against acculturative stress.[16] This may help explain why longer time in the United States and increased acculturation may result in higher levels of stress. Our finding that higher perceived discrimination was significantly associated with risk for suicidal ideation and attempts highlights the importance of the acculturative stress mechanism.

Acculturation and Suicidal Ideation and Attempts in Other Immigrant Populations

Research data suggest that the relationship between culture/ethnicity, immigration, acculturation, suicidal ideation and behavior is likely complex and may be specific for each ethnic group.[40] Therefore, among other immigrant populations, the relationship between acculturation and suicidality may differ from that reported among US Hispanics. Although there are some indications that lower ethnic identity is a specific risk factor for suicidal ideation and attempts among Blacks,[41,42] Borges et al[12] reported that foreign-born Blacks who had immigrated to the United States before age 13 had higher rates of suicidal ideation and attempts than US-born Blacks. They found similar results among Asians. Conversely, and consistent with our findings, they found that among Hispanics those who were US-born had higher rates of suicidal ideation and attempts than those who had immigrated to the United States before age 13. While low acculturation and intact traditional culture and values are protective factors against suicidal behaviors among Native American Indians, the opposite occurs among Native Hawaiian youth, in whom a strong Hawaiian cultural affiliation has been found to be a risk factor for attempted suicide.[43] Some studies suggest that the stress of migration is linked with increased risk for suicidal behavior, but there is also evidence to the contrary.[44] Furthermore, some authors have shown correlations between the suicide rates of immigrants and those of the country of origin, suggesting that the suicide rates for specific immigrant groups are to some extent predisposed by their experiences in their countries of origin.[44]

The Role of Sociodemographic Factors

We observed that acculturation remained a significant contributor to lifetime risk for suicidal ideation and attempts even after adjusting for sociodemographic variables. This contrasts with reports that ethnic differences in rates of suicidal behavior were largely explained by mediating factors such as sociodemographic factors.[9,13] Only 1 study[17] has examined the role of immigration/acculturation on suicidal ideation and attempts using the same methods in both the migrant-sending (Mexico) and migrant-receiving (United States) countries, and it found that sociodemographic differences did not explain the associations between immigration/acculturation and suicidal ideation and attempts, which is consistent with our findings.

Limitations

This study has the limitations of most large epidemiologic surveys. First, the assessment of suicidal ideation and attempts relied on lay interviews and was not confirmed by the use of medical records. Second, because NESARC sampled only civilian households and group quarters with populations 18 years and older, information was not available on adolescents, the homeless, individuals in prison, or undocumented immigrants. The questions related to lifetime suicidal ideation and suicide attempts were asked to those who screened into the depression section of the AUDADIS-IV.[32] To adjust for this, we limited our analysis to those individuals who screened into the depression section of the AUDADIS-IV. In a prior nationwide epidemiologic survey using similar methodology (the NIAAA 1991–1992 National Longitudinal Alcohol Epidemiologic Survey [NLAES]),[33] the number of individuals who did not screen into the depression section in the NLAES and reported a suicide attempt was very low (less than 0.1%), suggesting that this restriction is unlikely to have changed our pattern of results.

Acculturation is likely the outcome of many complex and conceptually different processes, including those that occur at the individual level throughout the person's lifetime (eg, age at migration, language acquisition, childhood socialization) and those at the population level, which may change across generations (eg, shifts in ethnic identity). Ideally, a study assessing acculturation should include comprehensive measures of all these underlying processes using a longitudinal design. However, such a detailed and lengthy longitudinal assessment would likely not be feasible in an epidemiologic study of a large, nationally representative population such as the NESARC sample. It would have been of interest to test whether the findings were different for specific ethnic and sociodemographic subgroups. However, these analyses were unfeasible due to the low cell counts that would have resulted in low power to test the hypotheses.

Another limitation is that the questions used to ascertain suicidal ideation and attempts had not been specifically validated for use with Hispanic people and presuppose a sophisticated understanding of the term *suicide*. Moreover, less acculturated individuals may be less likely to report suicidal ideation or attempts due to stigma associated with psychiatric symptoms and illness in "traditional" cultures.[45] Because the sampling framework of NESARC was the 2000 US Census, and some illegal immigrants may not be included in the census, it should be noted that NESARC may not capture some illegal immigrants.

Strengths

Despite these limitations, NESARC is the largest epidemiologic survey to date to provide information about suicidal ideation and suicide attempts in the United States

and to allow for detailed examination of ethnic groups and multidimensional acculturation measures.

CONCLUSIONS

Multiple facets of acculturation had a linear dose-related association with lifetime suicidal ideation and attempts, with higher levels of acculturation consistently associated with increased risk for lifetime suicidal ideation and attempts. Discrimination on the basis of race/ethnicity was also associated with increased risk for lifetime suicidal ideation and attempts. These results highlight some modifiable factors, such as protective aspects of the traditional Hispanic culture (eg, extended social networks, high social support, moral objections to suicide), that are potential targets for public health interventions aimed at decreasing suicide risk. Moreover, culturally sensitive mental health resources (in Spanish, and taking into account cultural attitudes and feelings toward mental illness) could be made more widely available. Providing health information and other services in Spanish and normalizing the use of Spanish as a second language by the Hispanic population might decrease the discrimination and stigma associated with Spanish language and Hispanic ethnic identity. It could be argued that part of the reason that immigrants become acculturated is that they strive to become immersed in the mainstream society as a way of escaping or preventing the discrimination and stigma that may be associated with Hispanic identity and culture (eg, Spanish language, Hispanic social networks).[45] Future studies assessing acculturation should include comprehensive measures of all the underlying processes, ideally using a longitudinal design. They should also test whether the relationship between acculturation and suicide risk differs across ethnic and sociodemographic subgroups.

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