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Authors

Afable-Munsuz, Aimee
Mayeda, Elizabeth Rose
Pérez-Stable, Eliseo J
et al.

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Immigrant Generation and Diabetes Risk Among Mexican Americans: The Sacramento Area Latino Study on Aging

Aimee Afable-Munsuz, PhD, MPH [Research fellow],
Division of General Internal Medicine, Department of Medicine, University of California, San Francisco

Elizabeth Rose Mayeda, MPH,
Department of Epidemiology and Biostatistics, University of California, San Francisco

Eliseo J. Pérez-Stable, MD, and
Medical Effectiveness Research Center for Diverse Populations, Division of General Internal Medicine, Department of Medicine, University of California, San Francisco

Mary N. Haan, DrPH
Department of Epidemiology and Biostatistics, University of California, San Francisco

Abstract

Objectives—We examined whether acculturation and immigrant generation, a marker for assimilation, are associated with diabetes risk in an aging Mexican-origin population.

Methods—We analyzed data on 1789 adults aged 60 to 101 years from the Sacramento Area Latino Study on Aging. We ascertained type 2 diabetes on the basis of diabetic medication use, self-report of physician diagnosis, or a fasting glucose 126 milligrams/deciliter or greater. Logistic regression modeled prevalent diabetes.

Results—Adjusting for age and gender, we observed significant but divergent associations between immigrant generation, acculturation, and diabetes risk. Relative to first-generation adults, second-generation adults had an odds ratio OR) of 1.8 (95% confidence interval [CI] = 1.4, 2.4) and third-generation adults had an OR of 2.1 (95% CI = 1.4, 3.1) of having diabetes. Greater US acculturation, however, was associated with a slightly decreased diabetes rate. In the full model adjusting for socioeconomic and lifestyle factors, the association between generation (but not acculturation) and diabetes remained significant.

Correspondence should be sent to Aimee Afable-Munsuz, MPH, PhD, Department of Community Health Sciences, SUNY Downstate School of Public Health, 450 Clarkson Avenue, Box 43, Brooklyn, New York 11203 (Aimee.afable-munsuz@downstate.edu).

Contributors

A. Afable-Munsuz originated the research study, wrote the first draft of the article, and supervised the analysis. E. R. Mayeda conducted all statistical analyses and reviewed drafts of the article. M. N. Haan was the principal investigator of the Sacramento Area Latino Study on Aging and assisted in the supervision of data analysis. M. N. Haan and E. J. Perez-Stable contributed to the conceptualization of the ideas and the interpretation of findings and reviewed drafts of the article.

Human Participant Protection

The institutional review boards of the University of Michigan, the University of California, Davis, and the University of California, San Francisco approved this study.

Conclusions—Our study lends support to the previously contested notion that assimilation is associated with an increased diabetes risk in Mexican immigrants. Researchers should examine the presence of a causal link between assimilation and health more closely.

Diabetes is increasing in the United States[1] and in countries that contribute the largest number of immigrants to the United States.[2–4] These immigrant populations, who originate from countries where diabetes is prevalent, provide a unique opportunity to study the development of diabetes. They are a "high event" population because of possible genetic predisposition,[5–8] and they experience rapid change in exposures; thus, they provide an efficient way to study the impact of environmental change on the progression of diabetes.

Immigrants are a large and dynamic segment of the US population. Between 1990 and 2000, the foreign-born population in the United States increased 57.0%, from 19.8 million to 31.1 million, compared with an increase of 9.3% for the native population.[9] It has been projected that 87.0% of the population growth between 2005 and 2050 will be driven by immigrants and their children.[10] In California, for example, Latino children, many of whom are immigrants or children of immigrants, for the first time make up the majority of the population younger than 18 years.[11]

Mexico is the largest contributor of immigrants to the United States[12] and has recently experienced rapid increases in both obesity and diabetes.[13–15] From 1994 to 2006, the national prevalence of diabetes in Mexico more than doubled, going from 6.7% to 14.4%.[13] This pattern is common in developing countries undergoing rapid urbanization. Social and economic change of rapid urbanization has led to more sedentary lifestyles and greater consumption of processed foods and calories, a process that has been labeled the "nutrition transition."[16,17]

In the United States it is well known that relative to non-Latino Whites, Latinos—those of Mexican origin in particular—bear a much larger burden of diabetes.[18–22] Because Latino immigrants constitute the largest proportion of immigrants to the United States by far, there has been interest in understanding whether acculturation to US lifestyles contributes to their heightened diabetes risk. The evidence on whether the risk of type 2 diabetes in Latino immigrant populations increases with greater time in the United States or acculturation, however, is mixed.[23–27] It is well documented that immigrants arrive with a health advantage despite an adverse social and economic profile, possibly reflecting migration selectivity[28–33] or the protective culture of immigrants, which encourages healthy behaviors and strong social support systems.[34,35] Over time, however, immigrants and subsequent generations lose at least some of this initial health advantage.[36,37] It is unknown whether diabetes contributes to the decline in the initial health advantage (sometimes called "unhealthy assimilation").[37] Furthermore, diabetes presents a unique case, as it is 1 of the few conditions for which evidence suggests that, relative to non-Latino Whites, Latinos carry a considerably higher risk and consequently are at a greater health disadvantage; it has been suggested that both genetics and environment contribute to this heightened risk.[6,32,38,39]

Although the Mexican national rate of diabetes is almost one and a half times higher than is the US rate,[2,40] it is not clear whether the US setting slows or accelerates the development of

diabetes. On the one hand, Mexican immigrants are moving from a country with high rates of diabetes to one with lower rates. But diabetes growth worldwide has also been attributed to global secular shifts in lifestyles and diet that result from upward social mobility and rapid urbanization.[41–43] Because Mexican immigrants to the United States are moving to a more affluent society, it would also be reasonable to postulate that their diabetes risk will be heightened with longer time or after several generations of living in the United States.[44]

Some studies have examined whether diabetes increases with longer US residence in middle-aged populations[24,26]; however, we are the first, to our knowledge, to focus on an aging Mexican-origin population, aged 60 years and older. We also examined whether there is significant heterogeneity in diabetes risk across different generations. Consistent with the unhealthy assimilation perspective,[37] we examined whether diabetes risk increases from the immigrant generation to US-born second and third generations, using data from the Sacramento Area Latino Study on Aging (SALSA).

METHODS

Participants in this study were members of the SALSA cohort. SALSA is a longitudinal cohort study (1997–2008) of 1789 community-dwelling Mexican Americans residing in California's Sacramento Valley, aged 60 to 101 years at baseline in 1998–1999. The study population and the participant recruitment procedure have been described elsewhere.[45] Briefly, to be eligible for the study, participants had to be residents of the Sacramento metropolitan statistical area and surrounding suburban and rural counties. An eligible person was aged 60 years or older in 1998 and self-designated as Latino. The sample was highly representative of older Latinos residing in the Sacramento area. In a 2-hour interview, each participant answered survey questions about lifestyle factors, acculturation, and medical diagnoses.[45] Trained interviewers also collected anthropometric measurements and drew fasting blood for measurement of lipids, antioxidants, glucose, and insulin. In-home visits were conducted every 12 to 15 months for a total of 7 follow-up visits. Interviews were conducted in Spanish or English, according to the respondent's choice. We used only data collected during the baseline interview for our analysis.

Diabetes Ascertainment

All SALSA respondents were screened for type 2 diabetes mellitus. We ascertained diabetes by determining use of a diabetic medication, self-report of a physician's diagnosis, or fasting glucose of 126 milligrams/deciliter or greater.

Trained research staff obtained blood during the in-home interview and measured fasting glucose by standard venipuncture. Staff obtained information on medication by medicine chest inventory during the in-home interview.

Immigrant Generation and Acculturation

Sociologists who study the assimilation process among US immigrants view immigrant generation as a central variable conceptualized broadly as a time dimension reflecting increasing exposure to US social and cultural norms.[46] We assessed immigrant generation on the basis of nativity of the respondent and the respondent's parents, as reported by the

respondent. We classified a foreign-born respondent as a first-generation immigrant and a US-born respondent with at least 1 foreign-born parent as second generation; if the respondent and both parents were born in the United States, we classified him or her as third generation.[47,48]

From a sociological perspective, assimilation entails both social mobility and the extent to which the immigrant population achieves social and economic parity with the native population (i.e., whether the number of those with a college education increases across generations of Mexicans and reaches the number of native Whites) as well as acculturation or the gradual adoption of the traits of the host culture with a loss of those from their home country.[49] To measure the concept of acculturation, we used 10 items from the Acculturation Rating Scale for Mexican-Americans II scale, which assessed English and Spanish language and media use (6 items) and affinity toward Latino friendships (4 items). The scoring procedures were similar to those Cuellar et al.[50] recommended, resulting in a variable with a range of 0 to 6, with higher scores representing greater US acculturation. We also assessed language of interview in the descriptive analysis.

Covariates

Demographic factors included age (continuous) and gender. We selected additional covariates according to their potential association with immigrant generation, because they were thought to be potential mediators on the causal pathway between assimilation, acculturation, and diabetes risk.[23–27,51] Socioeconomic status (SES) factors included education (number of years), income sources, lifetime occupation, and health insurance status (whether they had insurance coverage). We derived income source from questions that assessed whether the respondent received any earned income (salary, pension, social security, or veterans benefits) or entitled income (disability, supplemental social security, housing subsidy, or food stamps). We grouped lifetime occupation into non-manual (e.g., managerial, professional, and administrative support), manual (e.g., farming, machine operation, and transportation), and no occupation or homemaker. Lifestyle factors included smoking (current, past, or never smoker), alcohol use, and physical activity, which are all known to vary by acculturation and to be associated with diabetes risk.[48,52,53]

We determined physical activity on the basis of a question that asked the respondent to classify usual outdoor walking pace (easy or casual; normal or average; brisk pace; very brisk or striding; and never walk outdoors). We measured waist circumference (in inches) at the level of maximum indentation over the abdomen when the participant bent to the side. We calculated body mass index (BMI) using the formula weight in kilograms divided by the square of height in meters.

Analytic Procedures

We compared differences in sociodemographic characteristics, health behaviors, and study outcomes by immigrant generation with the χ^2 test for categorical variables and analysis of variance for continuous variables. In the modeling stage, we examined 4 different logistic regression models predicting prevalent diabetes. First, we examined the effect of generation and acculturation on diabetes risk, adjusting for age and gender. Second, we added all SES

measures and lifestyle factors separately to examine whether their addition attenuated the relationship between generation and diabetes risk. Finally, in the full model we adjusted for all covariates at once. We performed all analyses in SAS version 9.2 (SAS Institute, Cary, NC).[54]

Because 17% of the participants had missing data on waist circumference, a key variable of the analysis, we performed a multiple imputation approach for the entire SALSA data set to accommodate incomplete data points. This was a sequential regression multivariate imputation approach that conditions on all observed variables as predictors.[55,56] The multiple imputation approach for SALSA has been described in detail elsewhere.[57] We performed sensitivity analyses using the nonimputed SALSA data set. We reached similar conclusions, with unchanged statistical significance compared with the analysis using multiple imputations. We used data from baseline in this analysis.

RESULTS

Overall, 58% of the SALSA participants were women. A majority (58%) had a Spanish-language interview. The mean number of years of education was 7.2, 43% reported 2 or more earned income sources (with no entitled income sources), and 59% had a manual lifetime occupation (Table 1). A large majority (81%) reported infrequent alcohol use, currently not smoking (89%), and a casual or average walking pace (74%). The mean BMI of SALSA participants at baseline was 30. Mean waist circumference was 38 inches. Overall, we classified 21% as having a diabetes diagnosis on the basis of medication alone and another 12% as having diabetes who were not taking medication; this resulted in our classifying 33% of all SALSA baseline respondents as having diabetes.

More than half of the SALSA participants were first-generation, about 40% were second-generation (respondent born in the United States but at least 1 foreign-born parent), and 9% were third-generation (respondent and both parents born in the United States) immigrants. Every indicator in Table 1 varied by immigrant generation with the exceptions of gender and smoking status. The proportion of respondents who completed the interview in English ranged from 14% in the first generation to about 88% in the third generation. Similarly, the mean acculturation score ranged from 1.3 among the first generation to 3.5 among the third generation (score range = 0–6). SES indicators also varied by immigrant generation. For example, the proportion reporting 2 or more earned income sources (with no entitled income source) ranged from 34% among first generation to about 56% among the third generation. Reports of brisk walking pace ranged from 14% in the first generation to 21% in the third generation. Finally, the proportion with a diabetes diagnosis ranged from 29% in the first generation to 39% in the third generation.

In the unadjusted analysis (Table 2), the generation and acculturation scores were both significantly associated with diabetes risk but had inverse relationships; for example, the odds of diabetes risk were significantly higher for third generation (vs first generation; odds ratio [OR] = 2.09; 95% confidence interval [CI] = 1.42, 3.11, but the odds decreased with increasing acculturation (OR = 0.88; 95% CI = 0.80, 0.95). We also assessed other logistic regression models. For example, in separate models, we assessed whether generation,

acculturation, and language of interview independently predicted diabetes risk, and only generation had a significant association with diabetes risk (acculturation OR = 1.01; 95% CI = 0.95, 1.08; language of interview OR = 1.07; 95% CI = 0.88, 1.31).

We tested whether there was a significant difference in diabetes risk between second and third generations; however, the difference was not statistically significant when comparing third to second generation (OR = 1.09; 95% CI = 0.77, 1.55). Finally, we examined whether there was an association between number of years in the United States and diabetes risk among the immigrant sample. However, the association was not statistically significant (OR = 1.00; 95% CI = 0.99, 1.00).

After adjusting for SES variables and lifestyle factors separately (Table 2), the significant association between generation and diabetes risk remained (e.g., after adjusting for lifestyle factors, comparing third to first generation, OR = 2.02; 95% CI = 1.31, 3.11), but the association between acculturation and diabetes risk was no longer significant. It is notable that in the full model, which adjusts for lifestyle and SES factors, the positive association between increasing generation and diabetes risk remained; compared with first generation, the odds for second (OR = 1.75; 95% CI = 1.30, 2.33) and third (OR = 2.00; 95% CI = 1.29, 3.10) generations were significantly higher. Waist circumference was also a strong predictor of diabetes risk in the full model (OR = 1.08; 95% CI = 1.05, 1.10). We also assessed BMI, in place of waist circumference, in the full model, and it was also significant (OR = 1.04; 95% CI = 1.02, 1.05). In light of evidence that waist circumference is a more sensitive predictor of diabetes risk in the elderly and in ethnic minority groups including individuals of Mexican origin,[58,59] we have presented findings for waist circumference. It is also notable that in the full model frequent or moderate versus occasional or never alcohol use was strongly associated with a decreased risk of diabetes in the full model (OR = 0.39; 95% CI = 0.28, 0.54), and brisk walking pace versus casual, infrequent, or never walking was moderately associated with a decreased risk of diabetes (OR = 0.75; 95% CI = 0.55, 1.03).

DISCUSSION

Our study suggests that immigrant generation is significantly associated with diabetes risk among our population-based sample of aging adults of Mexican origin. Diabetes risk is higher in US-born second- and third-generation individuals compared with immigrants. These associations are not influenced by acculturation, SES, or the lifestyle factors we measured. Of the SES and lifestyle factors we examined, only alcohol consumption was significantly associated with diabetes in multivariate models at the $P < .01$ level.

Our study also suggests that immigrant generation and acculturation, although strongly associated with each other (Table 1), capture different dimensions of immigrants' adaptation process to the United States. First, unlike immigrant generation, which was positively associated with diabetes risk, acculturation had an inverse association with diabetes risk in the unadjusted model. Second, the association between immigrant generation and diabetes risk persisted even after accounting for all study covariates; this was not the case for acculturation. This latter relationship was somewhat attenuated after adjusting for SES factors. These findings are consistent with results of past studies.[23–25,41] Although longer

US residence (derived from generation and time measures) has been associated with increased risk of diabetes,[23,24] acculturation (derived from language preference and ethnic identification) has been associated with a decreased risk of diabetes in diverse immigrant populations.[25,60,61] These empirical findings have been replicated in previous studies that used multiple measures of acculturation in relation to diabetes and other health indicators.[61,62]

Although these findings can be interpreted as inconsistent, they may also suggest that different measures of acculturation are proxies for different mechanisms and point to the complexity of the adaptation process of immigrants to the United States. In addition to changes in language preferences or ethnic identities—common constructs captured in acculturation measures used in existing health studies—there are many other dimensions to immigrants' transition and adaptation to the United States.[63–65] With regard to existing measures of acculturation, particularly those that rely on language use or preference, socioeconomic factors are likely to confound the relationship between acculturation level and health.[64] The addition of SES factors to our model slightly (6%) attenuated the association between the acculturation measure used and diabetes risk, and so our study provides evidence to support this contention.

From a broader perspective, increasing generations can be viewed as a marker of cumulative exposure to a new social, cultural, and physical environment. It is notable that the vast majority (more than 65%) of the first-generation SALSA participants migrated to the United States as adults. In this regard, our study provides evidence of an immigrant health advantage whereby being raised as a child in their home country of Mexico affords some protective effect on health, which then diminishes in subsequent generations. This interpretation leaves open the question of whether culture, environment, selection, or some combination of these factors explains our findings. Relating our findings to global changes in lifestyles and patterns in obesity and diabetes, however, may help elucidate some of the causal pathways implicated in this process of unhealthy assimilation.[43,66,67] Intra-country migrants who move from rural to urban areas or who transition from poverty to affluence, for example, can take on more sedentary jobs, which are markedly different from their former labor-intensive work, and adopt less healthy diets.[68,69] Migrants whomove from their home country to the United States seeking better economic opportunities undergo similar, perhaps more dramatic changes.

The implications of chronic stress associated with immigrants' new lifestyles in the United States, which are increasingly constrained by time and more demanding occupations, are largely unexplored. It is unknown, for example, whether the cumulative impact of exposure to repeated stressors or how the life course timing of exposure to stressors contributes to this heightened diabetes risk. Using National Health and Nutrition Examination Survey data, for example, Kaestner et al.[70] found that the impact of chronic stress, as measured by allostatic load, among older Mexican immigrants is lower on arrival in the United States, compared with US-born Mexican Americans or non-Latino Whites or Blacks; this health advantage decreased with greater time in the United States.[70]

Furthermore, health behaviors of immigrants are transformed by prevailing US ideologies concerning diet and nutrition,[71–73] and how the food culture of immigrant populations evolves from the immigrant generation to the US-born generations is central to understanding diabetes development. Chronic exposure to the US built environment (e.g., walkability, proximity to grocery stores, public transit), which is increasingly characterized as obesogenic,[74,75] may also play an important role in accelerating the development of diabetes in US immigrants.[76] Future studies should examine more closely and in greater detail transformations in immigrants' dietary and physical activity patterns, relationships to food and food preparation, the physical environment, and stress biomarkers as potential mediators or moderators of the relationship between assimilation and diabetes risk.

Finally, there is evidence that points to an increased susceptibility to diabetes among Mexican-origin populations in the United States because of genetic predisposition.[5,77] Given this background, studies that try to better understand mechanisms of determining onset of diabetes in Mexican-origin populations are even more relevant. The Mexican-origin population and higher event rate populations present unique opportunities to disentangle and study the role of genetics and how it may interact with chronic stressors and change in environments and behaviors.[78]

Limitations and Considerations for Future Research

Because we relied on cross-sectional data used from the SALSA baseline wave, it was beyond our scope to estimate temporal effects, which would help to establish causality. It is possible, for example, that the observed inverse association between alcohol use and diabetes risk has a reverse causal relationship such that diabetes diagnosis would cause respondents who report alcohol use to drink less whereas the undiagnosed respondents continued to drink as usual. The overall prevalence, however, of alcohol use in our sample was low, so this pattern may apply to only a small proportion of the respondents. We assessed only outdoor walking pace, which possibly underestimates physical activity levels; SALSA participants may also engage in other forms of leisure and nonleisure (e.g., job-, housework-, or transportation-related) activity. SALSA did not collect any dietary measures, and thus we were unable to examine the potential role that dietary change played in the relationship between assimilation and diabetes risk.

Cross-sectional studies of immigrants do not allow us to study key dynamic aspects of immigration at the individual level.[79] We had a cross-section of different generations in our study. Therefore, each generation may have come from a different migration cohort and thus have had a different migration experience.[37] Immigrant (first-generation) versus native-born (second- and third-generation) participants in our study may have come from different ancestral and regional groups in Mexico, who are diverse in genetic admixture[80,81] and social characteristics. This diversity may result in variations in diabetes risk.[82] Family intergenerational studies (parents and their offspring), prospective cohort studies of new immigrants followed at regular intervals,[79] and binational studies of migrants and their nonmigrant counterparts[44,83] would allow us to control for heterogeneity by place of origin, to study adaptation over time, and to assess immigrant selection. Finally, our measure of acculturation was a short adaptation of a previously validated scale.[50] Acculturation is

complex and requires extensive measurement, but such scales are time consuming and impractical and it is still unclear whether these more extensive scales have explanatory power over the shorter or 1-item language proxies in health studies.[84]

Conclusions

Relationships between migration, acculturation, and health are complex,[85] and both negative and positive associations between assimilation, acculturation, and diabetes and its risk factors have been observed.[23–27,37,48,86,87] This evidence from the health literature is not surprising given the heterogeneity of acculturation and assimilation processes in US immigrants, which scholars of migration have described.[88] Our study adds to the evidence on the adverse associations between accumulating exposure to US environment and diabetes risk and other health indicators in immigrants to the United States. It also highlights the need to employ more novel designs to evaluate whether there is a causal link between assimilation and poor health and, if so, to more closely examine potential mechanisms. We also suggest that such examinations would be of benefit when placed in the context of the global epidemic of diabetes.

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TABLE 1

Participant Characteristics by Immigrant Generation: Sacramento Area Latino Study on Aging, 1998–1999

Variable	Immigrant Generation				
	First, No. (%) or Mean ± SE	Second, No. (%) or Mean ± SE	Third, No. (%) or Mean ± SE	Total, No. (%) or Mean ± SE	*P*
	913 (51.30)	704 (39.50)	164 (9.20)	1781 (100.00)	
Type 2 diabetes					< .001
Yes	263 (28.80)	260 (36.90)	64 (39.00)	587 (33.00)	
No	650 (71.20)	444 (63.10)	100 (61.00)	1194 (67.00)	
Diabetes medication use					.004
Diabetic on medication	163 (17.90)	168 (23.90)	42 (25.60)	373 (20.90)	
Diabetic not on medication	100 (11.00)	92 (13.10)	22 (13.40)	214 (12.00)	
Nondiabetic	650 (71.20)	444 (63.10)	100 (61.00)	1194 (67.00)	
Gender					.22
Man	363 (39.80)	307 (43.60)	73 (44.50)	743 (41.70)	
Woman	550 (60.20)	397 (56.40)	91 (55.50)	1038 (58.30)	
Age	71.1 ± 7.50	70.2 ± 6.40	69.6 ± 7.20	70.7 ± 7.20	.005
Primary language					< .001
English	129 (14.10)	478 (67.90)	144 (87.80)	751 (42.20)	
Spanish	784 (85.90)	226 (32.10)	20 (12.20)	1030 (57.80)	
Acculturation score, 0–6	1.3 ± 1.20	3.2 ± 1.20	3.5 ± 1.00	2.3 ± 1.50	< .001
Years of education	5.0 ± 4.70	9.4 ± 4.90	10.5 ± 5.20	7.2 ± 5.30	< .001
Income					< .001
≥ 1 entitled or no income	271 (29.70)	145 (20.60)	28 (17.10)	444 (24.90)	
1 earned income, no entitled	330 (36.10)	196 (27.80)	45 (27.40)	571 (32.10)	
≥ 2 earned, no entitled	312 (34.20)	363 (51.60)	91 (55.50)	776 (43.00)	
Occupation					< .001
Nonmanual	105 (11.50)	219 (30.79)	48 (30.64)	372 (20.90)	
Manual	598 (65.50)	369 (52.66)	87 (52.02)	1054 (59.20)	
No occupation or homemaker	196 (21.50)	109 (15.54)	24 (14.45)	329 (18.50)	
Alcohol use					.013

Variable	Immigrant Generation				
	First, No. (%) or Mean ± SE	Second, No. (%) or Mean ± SE	Third, No. (%) or Mean ± SE	Total, No. (%) or Mean ± SE	*P*
Daily	75 (8.20)	62 (8.80)	18 (11.00)	155 (8.70)	
Weekly	77 (8.40)	87 (12.40)	25 (15.20)	189 (10.60)	
Monthly, yearly, rarely, or never	761 (83.40)	555 (78.80)	121 (73.80)	1437 (80.70)	
Smoking status					.15
Current	104 (11.30)	77 (10.90)	21 (12.80)	202 (11.34)	
Former	361 (39.50)	319 (45.30)	73 (44.50)	753 (42.30)	
Never	448 (49.10)	308 (43.80)	70 (42.70)	826 (46.40)	
Self-reported walking pace					.019
Never walk outdoors or unable to walk	34 (3.70)	35 (5.00)	5 (3.10)	74 (4.20)	
Easy, casual or normal, average	699 (76.60)	506 (71.90)	113 (68.90)	1318 (74.00)	
Brisk, very brisk, or striding	126 (13.80)	130 (18.50)	35 (21.30)	291 (16.30)	
Have medical insurance					< .001
Yes	769 (84.20)	685 (97.30)	161 (98.20)	1615 (90.70)	
No	144 (15.80)	19 (2.70)	3 (1.80)	166 (9.30)	
BMI	29.5 ± 5.80	30.3 ± 6.40	30.2 ± 6.00	29.9 ± 6.10	.018
Waist circumference, inches	37.9 ± 5.00	38.5 ± 5.30	38.4 ± 5.00	38.2 ± 5.10	.084

Note. BMI = body mass index (defined as weight in kilograms divided by the square of height in meters). Percentages may not equal 100% because of rounding.

TABLE 2

Prevalent Diabetes: Sacramento Area Latino Study on Aging, 1998–1999

Variable	Base Model, OR (95% CI)	Socioeconomic Status Adjusted, OR (95% CI)	Lifestyle Adjusted, OR (95% CI)	Full Model, OR (95% CI)
Generation				
Third	2.09* (1.42 3.11)	1.98* (1.31, 2.98)	2.02* (1.31, 3.11)	2.00* (1.29, 3.10)
Second	1.84* (1.41, 2.41)	1.66* (1.26, 2.20)	1.81* (1.36, 2.42)	1.75* (1.30, 2.33)
First (Ref)	1.00	1.00	1.00	1.00
Acculturation	0.88* (0.80, 0.95)	0.93 (0.83, 1.03)	0.92[a] (0.84, 1.01)	0.95 (0.85, 1.06)
Age	1.00 (0.98, 1.01)	1.00 (0.98, 1.01)	0.99 (0.97, 1.01)	0.99 (0.97, 1.01)
Gender				
Man	1.19 (0.97, 1.45)	1.11 (0.88, 1.39)	1.36[a] (1.07, 1.73)	1.44* (1.11, 1.86)
Woman (Ref)	1.00	1.00	1.00	1.00
Waist circumference, inches		1.07* (1.05, 1.10)	1.08* (1.05, 1.11)	1.08* (1.05, 1.10)
Years of education		0.98 (0.95, 1.01)		0.98 (0.95, 1.01)
No. of earned income sources				
≥ 2		0.74* (0.57, 0.98)		0.78[a] (0.58, 1.03)
1		0.79 (0.60, 1.04)		0.76 (0.57, 1.01)
0 (Ref)		1.00		1.00
Occupation				
Manual		0.85 (0.63, 1.16)		0.83 (0.60, 1.14)
No occupation or homemaker		1.04 (0.72, 1.51)		0.97 (0.66, 1.42)
Nonmanual (Ref)		1.00		1.00
Medical insurance				
Yes		1.61[a] (1.08, 2.40)		1.49[a] (0.99, 2.24)
No (Ref)		1.00		1.00
Alcohol use				
Frequent or moderate			0.38* (0.27, 0.52)	0.39* (0.28, 0.54)
Occasional or never (Ref)			1.00	1.00
Smoking				
Current			0.90 (0.61, 1.32)	0.89 (0.60, 1.31)
Former			1.10 (0.86, 1.39)	1.09 (0.86, 1.39)
Never (Ref)			1.00	
Walking activity				
Brisk walker			0.75[a] (0.56, 1.02)	0.75[a] (0.55, 1.03)
Casual, infrequent, or never (Ref)			1.00	1.00

Note. CI = confidence interval; OR = odds ratio.

[a]Variable approached statistical significance at $P < .1$.

*$P < .01$.