Binational utilization and barriers to care among Mexican American border residents with diabetes

Hendrik D. de Heer[1], *Jennifer Salinas,*[2] *Lisa M. Lapeyrouse,*[3] *Josiah Heyman,*[4] *Osvaldo F. Morera,*[5] *and Hector G. Balcazar*[2]

Suggested citation de Heer HD, Salinas J, Lapeyrouse LM, Heyman J, Morera OF, Balcazar HG. Binational utilization and barriers to care among Mexican American border residents with diabetes. Rev Panam Salud Publica. 2013;34(3):147–54.

ABSTRACT

Objective. *To assess whether U.S.-Mexico border residents with diabetes 1) experience greater barriers to medical care in the United States of America versus Mexico and 2) are more likely to seek care and medication in Mexico compared to border residents without diabetes.*

Methods. *A stratified two-stage randomized cross-sectional health survey was conducted in 2009–2010 among 1 002 Mexican American households.*

Results. *Diabetes rates were high (15.4%). Of those that had diabetes, most (86%) reported comorbidities. Compared to participants without diabetes, participants with diabetes had slightly greater difficulty paying US$ 25 (*P = *0.002) or US$ 100 (*P = *0.016) for medical care, and experienced greater transportation and language barriers (*P = *0.011 and 0.014 respectively) to care in the United States, but were more likely to have a person/place to go for medical care and receive screenings. About one quarter of participants sought care or medications in Mexico. Younger age and having lived in Mexico were associated with seeking care in Mexico, but having diabetes was not. Multiple financial barriers were independently associated with approximately threefold-increased odds of going to Mexico for medical care or medication. Language barriers were associated with seeking care in Mexico. Being confused about arrangements for medical care and the perception of not always being treated with respect by medical care providers in the United States were both associated with seeking care and medication in Mexico (odds ratios ranging from 1.70 –2.76).*

Conclusions. *Reporting modifiable barriers to medical care was common among all participants and slightly more common among 1) those with diabetes and 2) those who sought care in Mexico. However, these are statistically independent phenomena; persons with diabetes were not more likely to use services in Mexico. Each set of issues (barriers facing those with diabetes, barriers related to use of services in Mexico) may occur side by side, and both present opportunities for improving access to care and disease management.*

Key words Hispanic Americans; Mexican Americans; diabetes mellitus; border areas; border health; Texas; Mexico; United States.

The U.S.-Mexico border region has pressing health and social issues, limiting the access to health care of its residents (1). An important issue related to access to care is the limited socioeconomic means of many border residents, as poverty rates in border areas are much higher than national averages (2). In addition, health care in border areas is expensive (e.g., expenditures per person for Medicare of border resi-

[1] Department of Physical Therapy and Athletic Training, Northern Arizona University, Flagstaff, Arizona, United States of America.

[2] School of Public Health, University of Texas Health Science Center, Houston, Texas, United States of America. Send correspondence to: Jennifer Salinas, jennifer.j.salinas@uth.tmc.edu

[3] Department of Public Health and Health Sciences, University of Michigan–Flint, Flint, Michigan, United States of America.

[4] Department of Sociology and Anthropology, University of Texas at El Paso, El Paso, Texas, United States of America.

[5] Department of Psychology, University of Texas at El Paso, El Paso, Texas, United States of America.

dents are in the top percentiles) (3). As a result, according to the U.S.-Mexico Border Health Commission, the region is medically underserved, and if the U.S.-Mexico border area were a state, it would rank last in health care access in the United States (1). In addition to economic barriers, Mexican American populations living in border areas may face additional challenges to accessing health services, including language and cultural barriers, lack of transportation, and geographic inaccessibility, among others (1, 4–7).

One of the region's most urgent health issues is the high rate of diabetes and diabetes related deaths. Based on data from the U.S.-Mexico Border Diabetes Prevention and Control Project (8), the estimated prevalence of diabetes among individuals living along the U.S.-Mexico border is 15.7%, compared to 8.3% nationally (8). The high prevalence of diabetes (and other cardiovascular and metabolic conditions), combined with limited access to care is expected to present substantial public health challenges for the near future. To date, however, very little is known about barriers and access to care among people with diabetes living in the binational and bicultural environment of the border area.

Within this context, even though the phenomenon of "crossing the border for health care and medication" was described several decades ago (9), to date, very little is known as to whether U.S. border residents with diabetes utilize medical care or purchase medications in Mexico. Largely anecdotal and observational studies (not focused on people with diabetes) have described utilization of care in Mexico as an opportunity to receive beneficial, affordable personalized and culturally competent care, whereas others described seeking care in Mexico as being primarily driven by the inaccessibility of the U.S. health care system (10–12). Findings from a very small number of recent studies, not focused on people with diabetes, indicate that approximately 25% of respondents reported purchasing medication and 10%–15% of respondents reported seeking medical care in Mexico in the past year (13–16). In these studies, financial barriers to seeking care were the most consistent predictors associated with seeking care across the border (13–15, 17). In addition, a number of variables indicating low acculturation (13, 15) (e.g., limited English proficiency), and having a poor health status or urgent need for care (15–17), have been associated with seeking care in Mexico (13, 15).

Although previous research provided insight into which barriers to receiving care in the United States may be associated with seeking care in Mexico, the studies conducted generally used small convenience samples and did not distinguish between barriers and care-seeking patterns for participants with and without diabetes. Gaining insight into the patterns of health care utilization of Mexican Americans with diabetes living in the U.S.-Mexico border area is essential for developing appropriate interventions and policies aimed at reducing the burden of diabetes and progression into complications. Therefore, the current study aimed to 1) establish key barriers to health care utilization and 2) compare care-seeking patterns in Mexican Americans with and without diabetes living in a large metropolitan border area. It was hypothesized that Mexican Americans with diabetes would experience greater barriers to obtaining health care and medication in the United States, and that due to financial limitations and greater need they would seek care in Mexico more frequently.

MATERIALS AND METHODS

Study setting

The current study setting was El Paso, Texas, a large city located directly on the U.S.-Mexico border in southwest Texas. Directly on the other side of the El Paso border is the large city of Ciudad Juárez, Chihuahua, Mexico. In part due to its proximity, a large number of people cross the border daily for employment, to see family, or to seek health services. In El Paso, approximately 80% of residents are of Mexican American descent (18). Similar to other U.S.-Mexico border areas, the El Paso area is characterized by low median per capita income (just under US$ 29 000, which is more than 25% lower than U.S. state averages), with almost 25% of residents living below the poverty level and almost one-third of residents without health insurance (18).

Study design and participants

A randomized household survey was conducted between November 2009 and May 2010. Households were selected through a stratified two-stage probability sampling design selecting 50 strata constructed from electronic census tract data for the city of El Paso. Census tracts located in close proximity were combined to ensure a population of approximately 13 000 residents per stratum. The sampling approach is described in more detail elsewhere (19) and was used to ensure coverage of the entire population in terms of access, geographic locale, and health status. A total of 20 households were recruited for each of the 50 strata, except for one, which had 22, resulting in a total of 1 002 households. Within each household, one adult respondent of Mexican American descent was interviewed in person by a bilingual interviewer in their preferred language (English or Spanish). An incentive was provided for completion of the interview. All procedures were approved by the Institutional Review Board of the University of Texas in El Paso and the School of Public Health at the University of Texas Health Science Center in Houston. Additional details are described elsewhere (19).

Measures and instruments

Demographic information. The survey was available in both Spanish and English. A total of 40.2% of participants chose to complete the survey in Spanish. Demographic characteristics included each participant's age, sex, and birthplace, number of years in the United States, approximate annual household income, and insurance status. Response options for household income included "< US$ 5 000," "≥ US$ 5 000–US$ 10 000," "≥ US$ 10 000–US$ 20 000," "≥ US$ 20 000–US$ 30 000," and "≥ US$ 30 000–US$ 40 000," increasing by increments of US 10 000 through "> US$ 70 000." Income was then recoded into "households with annual income ≥ US$ 20 000" and "households with annual income < US$ 20 000." Insurance status was dichotomized into 1) continuously insured during the past year or 2) not continuously insured during the past year.

Health conditions. Diabetes prevalence was assessed by asking participants "Have you ever been told by a health care provider (such as a doctor or a nurse) that you have or have had diabetes?" Respondents who answered "Yes" were coded as having diabetes and those

TABLE 1. Summary of questions relevant to barriers to health care among Mexican American border residents based on a randomized household survey in El Paso, Texas, 2010

1. Out-of-pocket medical expenses
   a. US$ 25: Would a medical cost of US$ 25 be difficult for you to pay?
   b. US$ 100: Would a medical cost of US$ 100 be difficult for you to pay?
   c. US$ 1 000: Would a medical cost of US$ 1 000 be difficult for you to pay?
2. Co-payment: In the past year, have you declined a medical treatment or test because you could not afford the co-payment?
3. Economic concerns: In the past three years, have economic concerns kept you from seeking health care services in the United States?
4. Postponed services
   a. Have you postponed or not sought medical treatment or medication in the United States because of the cost?
   b. Have you postponed or not sought medical treatment or medication in Mexico because of the cost?
5. Rejection
   a. Have you postponed or not sought medical treatment or medication in the United States because you were afraid the medical provider would reject you for financial reasons (lack of insurance, low income)?
   b. Have you postponed or not sought medical treatment or medication in Mexico because you were afraid the medical provider would reject you for financial reasons (lack of insurance, low income)?
6. Understanding: Do you have difficulty understanding a) medical labels b) doctor's instructions c) insurance forms etc.?
7. Language
   a. When you go for medical treatment in the United States, do you have problems with language differences?
   b. When you go for medical treatment in Mexico, do you have problems with language differences?
8. Respect
   a. When you go for medical treatment in the United States, do you feel you are treated respectfully?
   b. When you go for medical treatment in Mexico, do you feel you are treated respectfully?
9. Confusion
   a. Have you postponed or not sought medical treatment or medication in the United States because you were confused by the required arrangements and documents to make an appointment at a doctor's office, clinic, etc.?
   b. Have you postponed or not sought medical treatment or medication in Mexico because you were confused by the required arrangements and documents to make an appointment at a doctor's office, clinic, etc.?

who answered "No" were not. Other health conditions (17 in total) were assessed by asking the same question but swapping the word "diabetes" for another condition (e.g., hypertension).

Access and barriers to care and medication in the United States and Mexico. Access and barriers to various health care variables were adapted from items developed by Heyman et al. (20). In addition, an iterative process was used in which project team members discussed the most suitable options of a series of candidate variables from the original question and answer options.

Access and utilization in the United States and Mexico. A series of questions was asked to determine if study participants had a health care provider or facility where they received health care, and if they had utilized health care services in the past three years. For the current study, the following question was included to determine if someone had a regular health care provider: "In general, when you become ill/ want advice about your health, is there a person/ place where you go most of the time?" ("Yes" or "No"). Seeking care in Mexico was assessed by asking: "In the past three years, have you gone to Mexico for medical care?" Medication purchasing in Mexico was assessed by asking: "In the past three years, have you gone to Mexico for pharmaceutical medicine?" Participants were also asked if they had family directly across the border in Ciudad Juárez ("Yes" or "No").

Barriers to care in the United States and Mexico. Barriers to care for the current study were assessed through nine questions summarized in Table 1. Each question was posed twice (for medical care in the United States and for medical care in Mexico). Financial barriers to seeking care were assessed through a series of five questions. Other barriers were assessed through four questions about not using health care or not receiving optimal health care as a result of barriers in language, not being treated respectfully in health care settings, or having difficulty navigating and understanding the U.S. health care system. Transportation as a barrier was assessed by asking: "In the past three years, have any problems with transportation kept you from seeking health care sources or providers?"

Analyses

Comparisons were made between participants with and without diabetes via independent-samples Student's *t*-tests (for continuous variables) or chi-squared tests (categorical variables). To assess

TABLE 2. Demographic and access-to-care variables of Mexican American border residents by diabetes status based on a randomized household survey conducted in El Paso, Texas, 2010

Variable	Diabetes (*n* = 154) %	No diabetes (*n* = 848) %	*P*[a]
Demographics			
Age (years) (SD)[b]	57.8 (15.1)	43.7 (16.5)	< 0.001[c]
Sex: female	71	65	0.149
Birthplace: Mexico	53.6	40.4	0.001[c]
Years in United States (SD)	40.9 (18.6)	33.0 (17.5)	< 0.001[c]
Financial barriers to care			
Household income > US$ 20 000	48.9	57.0	0.078
Has health insurance at least part of the past year	69.5	64.2	0.205
Refused medical care because of inability to afford a co-payment	18.6	12.7	0.062
Has difficulty paying US$ 25 for medical care ("Yes" + "Maybe" vs. "No")	33.3	21.8	0.002[c]
Has difficulty paying US$ 100 for medical care ("Yes" + "Maybe" vs. "No")	81.8	72.1	0.016[d]
Has difficulty paying US$ 1 000 for medical care ("Yes" + "Maybe" vs. "No")	94.9	94.2	0.523
Did not seek care because of economic concerns	30.7	31.0	0.954
Postponed or not sought treatment in United States because of cost	32.6	39.5	0.132
Postponed or not sought treatment in Mexico because of cost[e]	11.8	16.2	0.508
Did not seek treatment because of fear of financial rejection in United States	25.2	23.2	0.621
Did not seek treatment because of fear of financial rejection in Mexico[e]	3.2	11.0	0.179
Other barriers to care			
Having transportation barriers to medical care in United States	13.3	7.1	0.011[d]
Having language barriers to medical care in United States	19.2	11.6	0.014[d]
Having language barriers to medical care in Mexico	1.5	0.8	0.382
Being treated disrespectfully at any time in medical settings in United States	25.0	28.2	0.703
Being treated disrespectfully at any time in medical settings in Mexico	22.2	25.6	0.666
Being confused about arrangements for medical care in United States	10.7	9.5	0.553
Being confused about arrangements for medical care in Mexico	0.0	6.5	0.139
Having difficulty understanding medical information/ instructions in United States	22.1	17.0	0.131
Use of care and medication			
Something prevented receipt of needed medication	25.0	19.4	0.116
Has a provider or person to go to when in need of medical care	86.8	71.8	< 0.001[c]
Had blood pressure checked in past year	98.0	86.5	< 0.001[c]
Had glucose checked in past year	98.0	71.9	< 0.001[c]
Had cholesterol checked in past year	92.7	67.5	< 0.001[c]
Currently using medication	86.0	42.6	< 0.001[c]
Seeking care and medication in Mexico			
Seeking care in Mexico often or sometimes (vs. not)	18.9	23.8	0.192
Seeking medication in Mexico often or sometimes (vs. not)	21.6	27.3	0.167

[a] Based on independent-samples Student's *t*-tests (continuous variables) or chi-squared tests (categorical or dichotomous variables).
[b] Standard deviation.
[c] $P < 0.01$.
[d] $P < 0.05$.
[e] Only among subset of participants who reported going to Mexico for medical care.

which barriers to care were associated with diabetes status, a series of logistic regression analyses (with diabetes ("Yes" or "No") as the outcome variable) were conducted. Demographic variables (age, sex, years in United States, insurance status, income) were entered in the model, followed by each barrier to care (financial and other barriers). Due to the high inter-correlation among several of the financial and other barriers, each barrier was entered in a separate model. Finally, to assess whether diabetes status and barriers to care were associated with seeking care in Mexico, logistic regression analyses (with seeking care in Mexico ("Yes" or "No") as the outcome variable) were conducted, controlling for demographic variables. All analyses were conducted with SPSS version 19.0 (IBM Corp., Armonk, New York, USA).

RESULTS

Demographic characteristics and diabetes prevalence

The burden of reported diagnosed diabetes was high among the study population (15.4%). Almost all people with diabetes (86%) reported additional conditions (comorbidities), whereas only 29% of people without diabetes reported comorbidities. People who reported having diabetes were older (on average 57.8 years old, versus 43.7 years old for people who did not report diabetes) and more likely to be born in Mexico (53.6% versus 40.4%) but lived a similar proportion of their lives in the United States compared to people without diabetes (Table 2).

Comparing access and barriers to care between people with and without diabetes

Although financial barriers were common among all participants, on average, participants with diabetes appeared to have slightly greater financial barriers

TABLE 3. Factors associated with seeking care and medication in Mexico among Mexican American border residents based on a randomized household survey conducted in El Paso, Texas, 2010

	Seeking care in Mexico			Seeking medication in Mexico		
	OR[a]	95% CI	*P*[b]	OR	95% CI	*P*[b]
Constant	0.259		0.004[c]	0.432		0.061[d]
Demographics						
Age	1.022	1.008, 1.037	0.002[c]	1.015	1.002, 1.029	0.025[d]
Female	1.081	0.731, 1.598	0.696	1.097	0.753, 1.599	0.630
Years in United States	0.951	0.937, 0.966	< 0.001[c]	0.959	0.946, 0.973	< 0.001[c]
Has a person or place to go	1.601	1.049, 2.443	< 0.001[c]	1.195	0.801, 1.784	0.383
Having family directly across the border in Mexico	2.704	1.790, 4.085	< 0.001[c]	2.378	1.612, 3.509	< 0.001[c]
Economic barriers						
Income > US$ 20 000	1.135	0.779, 1.654	0.510	1.174	0.816, 1.174	0.388
Have health insurance	0.308	0.204, 0.460	< 0.001[c]	0.337	0.229, 0.495	< 0.001[c]
Financial barriers[e]						
Refused medical care because of inability to afford a co-payment	2.465	1.507, 4.030	< 0.001[c]	2.579	1.585, 4.195	< 0.001[c]
Having difficulty paying US$ 25 for medical care	1.319	0.870, 1.999	0.193	1.314	0.867, 1.992	0.198
Having difficulty paying US$ 100 for medical care	1.342	0.826, 2.180	0.235	1.349	0.856, 2.127	0.197
Having difficulty paying US$ 1 000 for medical care	1.830	0.524, 6.385	0.343	2.414	0.697, 8.360	0.164
Did not seek care because of economic concerns	2.957	2.005, 4.359	< 0.001[c]	2.844	1.949, 4.150	<0.001[c]
Postponed or not sought treatment in United States because of cost	3.941	2.615, 5.940	< 0.001[c]	3.613	2.451, 5.325	< 0.001[c]
Did not seek treatment because of fear of financial rejection in United States	3.152	2.064, 4.815	< 0.001[c]	3.010	1.991, 4.550	< 0.001[c]
Other barriers[e]						
Transportation barriers to medical care in United States	0.746	0.389, 1.432	0.379	0.838	0.437, 1.607	0.595
Language barriers to medical care in United States	1.812	1.073, 3.061	0.026[b]	1.446	0.859, 2.436	0.165
Confusion about arrangements in medical care in United States	1.932	1.710, 5.028	< 0.001[c]	2.757	1.637, 4.643	< 0.001[c]
Difficulty understanding medical info/ instructions in United States	1.002	0.626, 1.603	0.510	1.164	0.740, 1.833	0.511
Being treated disrespectfully at any time in medical care in United States	1.700	1.093, 2.645	0.019[d]	1.772	1.155, 2.719	0.009[c]
Difficulty obtaining medication	2.263	1.487, 3.442	< 0.001[c]	2.116	1.403, 3.191	< 0.001[c]
Health status[e]						
Having diabetes	0.716	0.411, 1.247	0.238	0.661	0.382, 1.145	0.140

[a] OR: odds ratio.
[b] Based on multivariate regression analyses.
[c] $P < 0.01$.
[d] $P < 0.005$.
[e] Each of these variables was run in a separate model.

to obtaining health care. For example, compared to people without diabetes, a greater proportion of people with diabetes reported not being able to afford out-of-pocket expenses for health care such as US$ 25 (33.3% versus 21.8%, $P = 0.002$) or US$ 100 (81.8% versus 72.1%, $P = 0.016$). Likewise, slightly more of them reported being refused medical care because of inability to afford a co-payment (18.6% versus 12.7%, $P = 0.062$). In addition, a greater proportion of participants with diabetes reported transportation barriers (13.3% versus 7.1%, $P = 0.011$) and language barriers to medical care (19.2% versus 11.6%, $P = 0.014$). If corrections for multiple comparisons were made (e.g., by using a more stringent criteria of $P < 0.01$), only one of the barriers would be statistically significantly higher among participants with diabetes. Compared to those without diabetes, a consistently greater proportion of participants with diabetes reported being referred to a provider in the past three years (38.5% versus 27.8%, $P < 0.001$) and having a person or place to go for medical care (86.8% versus 71.8%, $P < 0.001$). Those with diabetes were also more likely than those without the condition to have their blood pressure, glucose, and cholesterol checked ($P < 0.001$) (Table 2).

Barriers to care and binational care-seeking

Almost one-quarter of participants sought care or medication in Mexico. Although not statistically significant, a slightly smaller proportion of participants with diabetes reported going to Mexico "often" or "sometimes" for medical care (18.9% versus 23.8%, $P = 0.192$) or medication (21.6% versus 27.3%, $P = 0.167$) (Table 2). The primary reason for seeking care and medication in Mexico was cost, which was mentioned by 89.4% of people who reported having gone to Mexico for medical care and by 86.1% of people seeking medication in Mexico in the past three years. The next most common reason to seek medical care was having trust in a Mexican doctor or clinic (30.5% of people seeking care in Mexico). A total of 55.8% of participants reported having family in the neighboring city of Ciudad Juárez.

In logistic regression models (Table 3), age was associated with higher odds of going to Mexico for medical care (OR = 1.022, $P = 0.002$) and medication (OR = 1.015, $P = 0.025$). Years lived in the United States (OR = 0.951 for health care and OR = 0.959 for medication, $P < 0.001$) and having health insurance were associated with lower odds of seeking care (OR = 0.308, $P < 0.001$) and medication in Mexico (OR = 0.337, $P < 0.001$). Having a family member directly across the border was strongly associated with seeking care (OR = 2.704, $P < 0.001$) and medica-

tion (OR = 2.378, $P < 0.001$) in Mexico. Controlling for effects of demographic indicators, income, and insurance status, diabetes status was not a significant predictor of seeking care or medication in Mexico in these models.

Finally, the research team explored which financial, social, and cultural barriers to care in the United States were associated with seeking care and medication in Mexico among all participants, independent of diabetes status. Participants who 1) were refused medical care because of an inability to afford a co-payment (OR = 2.465, $P < 0.001$); 2) did not seek care because of economic concerns (OR = 2.957, $P < 0.001$); 3) postponed treatment because of cost (OR = 3.941, $P < 0.001$); or 4) did not seek treatment for fear of financial rejection in the United States (OR = 3.152, $P < 0.001$) had higher odds of seeking care in Mexico. Most financial barriers were associated with approximately threefold increased odds of going to Mexico for medication (Table 3). Further, participants with language barriers to care in the United States were almost twice as likely to report going to Mexico for medical care (OR = 1.812, $P = 0.026$). Participants who experienced confusion about arrangements for medical care in the United States had higher odds of reporting care-seeking (OR = 1.932, $P < 0.001$) or medication (OR = 2.757, $P < 0.001$) in Mexico. Finally, people who had difficulty obtaining medication had higher odds of seeking care in Mexico for both medical care (OR = 2.263, $P < 0.001$) and medication (OR = 2.116, $P < 0.001$).

DISCUSSION

The current study aimed to compare the barriers to care and binational care-seeking patterns among border residents living with and without diabetes. Results indicated the proportion of adults reporting diagnosed diabetes was high, and almost all participants with diabetes had an additional comorbidity. Participants with diabetes were slightly more likely to report a number of barriers to care (including financial, language, and transportation). Participants with diabetes, however, were also more likely to have someone to go to for medical care and to have received health screenings.

Going to Mexico for medical care and medication in the past three years was reported by approximately one-quarter of participants. Consistently, independent of insurance status and income, financial barriers were associated with much higher odds of seeking care and medication in Mexico. Further, language barriers and confusion about the U.S. health care system were associated with seeking medical care or medication in Mexico. Seeking care or medication in Mexico was not different for participants with or without diabetes.

In general, most participants in the current study experienced some kind of financial barrier to obtaining health care in the United States. In particular, out-of-pocket expenses were more common among people with diabetes in the current study compared to people with no diagnosed diabetes. More than 80% of participants with diabetes reported that US$ 100 would be difficult for them to afford. Poor disease management and health outcomes are already more common among Hispanic populations (21, 22), and these barriers are likely to lead to unmanaged disease, even when residents have a regular person or place to go for health care (23). A substantial proportion of participants reported one or more barriers associated with language or receiving respectful treatment in medical settings. These barriers, combined with the high prevalence of diabetes in this population, are reason for concern. In contrast to the authors' a priori hypotheses, based on prior research, that had shown that the need for care and poor reported health status were associated with seeking care in Mexico, health status variables, including diabetes, were not associated with seeking care in Mexico, suggesting that seeking care across the border is not limited to those with diagnosed common chronic conditions such as diabetes.

Implications and future research

In sum, barriers to health care were highly prevalent among the study population and participants with diabetes experienced slightly greater barriers to care. Seeking care across the border was common, but not more likely among people with diabetes, and mostly driven by cost and limited access to care in the United States. However, several other barriers to care in the United States, including barriers associated with language, health literacy, and perceived respect in medical settings, were associated with seeking care and medication in Mexico. The majority of respondents did not currently go to Mexico for medical care or medication.

In future research and practice it will be important to determine if a continuum of care is provided to patients (i.e., whether or not health care addresses barriers to the diagnosis of disease in addition to screening for the disease, to address the large proportion of people with undiagnosed disease in the border area). Furthermore, the fact that 86% of persons with diabetes in this study reported comorbidities underscores the need for a comprehensive approach to disease treatment, management, and prevention using a combination of clinical and community interventions that include targeted approaches to address modifiable risk factors (i.e., those that can be addressed, such as out-of-pocket expenses and transportation or language barriers). A useful framework within this context is the Health Care Access and Barriers Model (HCAB) recently developed by Carillo and colleagues (24). This model specifies modifiable barriers to health care and provides a framework guideline for opportunities to improve disease diagnosis and management among low-income border residents. Recently implemented approaches that include the use of *promotoras de salud* or community health workers (e.g., (25)), similar to the one used by the U.S.-Mexico Border Diabetes Prevention and Control Project, could 1) target specific barriers identified as limiting access to care in this study, and 2) use approaches that address a full spectrum of risk factors for cardiovascular disease (26). These types of intervention approaches could also help address some of the barriers reported by immigrants living in U.S.-Mexico border areas, where the importance of community-oriented health services has been confirmed (19, 20).

Limitations

This study had some limitations. First, the responses to all of the survey questions were collected through an interview and were self-reported. Second, due to the unique characteristics of the study participants, who were dispro-

portionately 1) female and 2) residents of large metropolitan border areas, generalizability of the current findings to other populations may be limited. Third, in the comparison of barriers to health care for participants with and without diabetes, even though a large number of variables were tested, if more stringent criteria for statistical significance had been used, only one barrier would have been statistically significant. Finally, given the cross-sectional nature of the study, it is not possible to make inferences about causality. For example, there was some indication that participants with diabetes experienced greater financial barriers to care than those without diabetes. However, it is unclear whether this financial burden is a factor that preceded and is associated with people developing diabetes or whether this financial burden is a consequence of having diabetes.

Conclusions

The current study aimed to gain insight into the care-seeking patterns of Hispanic border residents with and without diabetes. It was found that participants with diabetes were slightly more likely to experience financial, transportation, and language barriers to health care versus those without diabetes. In addition, crossing the border for care or medication was common and more likely among those with financial, language, and literacy barriers, but whether or not participants had diabetes was not a contributing factor. Future research should focus on whether addressing out-of-pocket medical expenses and health literacy can reduce disease burden and improve disease management among Mexican American border residents.

Funding. The current project was funded by the National Institutes of Health (NIH) National Center on Minority Health and Health Disparities (NCMHD) (grant no. 1P20 MD002287-01) as a sub-project (*A Household Survey To Explore Health Disparity Domains on the US-Mexico Border*) (principal investigator, HGB).

Conflicts of interest. None.

REFERENCES

1. United States–Mexico Border Health Commission. Healthy Border 2010. An agenda for improving health on the United States-Mexico border. El Paso, TX: USMBHC; 2003. Available from: http://www.borderhealth.org/files/res_63.pdf Accessed 15 July 2013.
2. United States Census Bureau. The Hispanic population: 2010. Washington: USCB; 2011. Available from: http://www.census.gov/prod/cen2010/briefs/c2010br-04.pdf Accessed 29 October 2012.
3. Bastida E, Brown HS 3rd, and Pagán JA. Persistent disparities in the use of health care along the US-Mexico border: an ecological perspective. Am J Public Health. 2008;98(11):1987–95.
4. Estrada AL, Treviño FM, Ray LA. 1990. Health care utilization barriers among Mexican Americans: evidence from HHANES 1982–84. Am J Public Health. 1990;80 Suppl:27–31.
5. DuBard CA, Gizlice Z. Language spoken and differences in health status, access to care, and receipt of preventive services among US Hispanics. Am J Public Health. 2008;98(11):2021–8.
6. Timmins CL. The impact of language barriers on the health care of Latinos in the United States: a review of the literature and guidelines for practice. J Midwifery Womens Health. 2002;47(2):80–96.
7. Johnson RL, Saha S, Arbelaez JJ, Beach MC, Cooper LA. Racial and ethnic differences in patient perceptions of bias and cultural competence in health care. J Gen Intern Med. 2004;19(2):101–10.
8. Pan American Health Organization. The U.S.-Mexico Border Diabetes Prevention and Control Project. First report of results. Washington: PAHO; 2005. Available from: http://www.fep.paho.org/english/publicaciones/Diabetes/Diabetes%20first%20report%20of%20Results.pdf
9. Borrell J. Health care bargains in Mexico. Time. June 15, 1987;129(24):60.
10. Warner DC. Health issues at the US-Mexican border. JAMA. 1991;265(2):242–7.
11. Ruiz-Beltran M, Kamau JK. The socioeconomic and cultural impediments to well-being along the US-Mexico border. J Community Health. 2001;26(2):123–32.
12. Calvillo JP, Lal L. Pilot study of a survey of US residents purchasing medications in Mexico: demographics, reasons, and types of medications purchased. Clin Ther. 2003;25(2):561–77.
13. Byrd TL, Law JG. Cross-border utilization of health care services by United States residents living near the Mexican border. Rev Panam Salud Publica. 2009;26(2):95–100.
14. Escobedo LG, Cardenas VM. Utilization and purchase of medical care services in Mexico by residents of the United States of America, 1998–1999. Rev Panam Salud Publica. 2006;19(5):300–5.
15. Wallace SP, Mendez-Luck C, Castañeda X. Heading south: why Mexican immigrants in California seek health services in Mexico. Med Care. 2009;47(6):662–9.
16. Macias EP, Morales LS. Crossing the border for health care. J Health Care Poor Underserved. 2001;12(1):77–87.
17. Su D, Richardson C, Wen M, Pagán JA. Cross-border utilization of health care: evidence from a population-based study in south Texas. Health Serv Res. 2011;46(3):859–76.
18. Texas Department of State Health Services. Center for Health Statistics. Texas Health Currents [database on the Internet]. Austin, TX; c2008 [updated 11 March 2011]. Available from: http://www.dshs.state.tx.us/chs/healthcurrents/ Accessed 10 October 2012.
19. Lapeyrouse LM, Morera OF, Heyman JMC, Amaya MA, Pingitore NE, Balcazar H. A profile of US-Mexico border mobility among a stratified random sample of Hispanics living in the El Paso-Juarez area. J Immigr Minor Health. 2012;14(2):264–71.
20. Heyman JM, Núñez GG, and Talavera V. Healthcare access and barriers for unauthorized immigrants in El Paso County, Texas. Fam Community Health. 2009;32(1):4–21.
21. Harris MI, Eastman RC, Cowie CC, Flegal KM, Eberhardt MS. Racial and ethnic differences in glycemic control of adults with type 2 diabetes. Diabetes Care. 1999;22(3):403–8.
22. Harris MI. Racial and ethnic differences in health care access and health outcomes for adults with type 2 diabetes. Diabetes Care. 2001;24(3):454–9.
23. Karter AJ, Ferrara A, Darbinian JA, Ackerson LM, Selby JV. Self-monitoring of blood glucose: language and financial barriers in a managed care population with diabetes. Diabetes Care. 2000;23(4):477–83.
24. Carillo JE, Carillo VA, Perez HR, Salas-Lopez D, Natale-Peirera A, Byron AT. Defining and targeting health care access barriers. J Health Care Poor Underserved. 2011;22(2):562–75.
25. Balcazar HG, de Heer H, Rosenthal L, Aguirre M, Flores L, Puentes FA, Cardenas VM, Duarte MO, Ortiz M, Schulz LO. A promotores de salud intervention to reduce cardiovascular disease risk in a high-risk Hispanic border population, 2005–2008. Prev Chronic Dis. 2010;7(2):A28.
26. de Heer HD, Balcazar HG, Morera OF, Lapeyrouse LM, Heyman J, Salinas J, Zambrana RE. Barriers to care and comorbidities along the U.S.-Mexico Border. Public Health Reports. Forthcoming 2013.

Manuscript received n 5 November 2012. Revised version accepted for publication on 29 July 2013.

RESUMEN

Utilización binacional y barreras a la atención en las personas con diabetes que residen en la frontera mexicano-estadounidense

Objetivo. Evaluar si las personas con diabetes que residen en la frontera mexicano-estadounidense 1) encuentran mayores barreras para obtener atención médica en los Estados Unidos de América que en México; y 2) acuden a México en busca de atención y medicación con mayor probabilidad que las personas no diabéticas que residen en la frontera.

Métodos. Durante el 2009 y el 2010, en una muestra de 1 002 hogares mexicano-estadounidenses, se llevó a cabo una encuesta transversal de salud en dos etapas, estratificada y aleatorizada.

Resultados. Las tasas de diabetes eran elevadas (15,4%). La mayor parte de las personas con diabetes (86%) notificaron comorbilidades. En comparación con los participantes no diabéticos, los afectados de diabetes experimentaban dificultades algo mayores para pagar US$ 25 (P = 0,002) o US$ 100 (P = 0,016) por recibir atención médica, y encontraban mayores barreras en materia de transporte e idioma (P = 0,011 y 0,014, respectivamente) para ser atendidos en los Estados Unidos, aunque era más probable que contaran con una persona o lugar adonde acudir en busca de atención médica y para ser sometidos a tamizaje. Una cuarta parte de los participantes acudían a México en busca de atención o medicamentos. Una edad menor y el haber vivido en México se asociaban con la búsqueda de atención en México, pero no el padecer diabetes. La presencia de múltiples barreras financieras se asociaba independientemente con una probabilidad aproximadamente tres veces mayor de acudir a México en busca de atención médica o medicación. Las barreras idiomáticas se asociaban con la búsqueda de atención en México. La confusión acerca de los trámites para recibir atención médica y la percepción de no recibir siempre un trato respetuoso por parte de los proveedores de atención médica en los Estados Unidos se asociaban con la búsqueda de atención y medicación en México (*odds ratio*, 1,70–2,76).

Conclusiones. La notificación de barreras modificables a la atención médica fue frecuente entre los participantes y algo más frecuente entre 1) las personas con diabetes; y 2) los que buscaban se atendidos en México. Sin embargo, estos fenómenos son estadísticamente independientes; no era más probable que las personas con diabetes utilizaran servicios en México. Ambos conjuntos de problemas (las barreras que deben afrontar las personas con diabetes, las barreras relacionadas con el uso de servicios en México) pueden coexistir, y proporcionan oportunidades para mejorar el acceso a la atención y el tratamiento de las enfermedades.

Palabras clave Hispanoamericanos; americanos mexicanos; diabetes mellitus; áreas fronterizas; salud fronteriza; Texas; México; Estados Unidos.