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Migration, Health Care Behaviors, and Primary Care for Rural Latinos with Diabetes

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Abstract Many US Latinos migrate or travel between the US and Mexico on a regular basis, defined as circular migration. Latinos with diabetes ($n = 250$) were surveyed about circular migration and their ability to use medications and perform recommended diabetes self-care activities. A review of medical charts was performed. Twenty-eight percent ($n = 70$) of patients traveled to Mexico during the last 12 months. Older Latinos were more likely to report traveling to Mexico and back into the US. Among those that traveled, 29 % reported use of less medication than they wanted to or were prescribed because of travel and 20 % ran out of medications. The rate of reported problem areas while traveling were 39 % (27/70) for following a diabetic diet, 31 % (21/70) for taking medication, and 37 % (26/70) for glucose self-monitoring. The results suggest that the structure of primary care and care coordination are important for this population to fully engage in diabetes self-care.

Keywords Latinos · Diabetes · Migration · Bi-national healthcare

Introduction

Although Latinos are rapidly growing in communities across the US, their patterns of migration in and out of the US and implications on health are not well understood [1–3]. For Latinos settled in the US, migration patterns vary and include those that move both ways across the US–Mexico border throughout the year, including those that stay in Mexico for a few weeks or months. This pattern of migration and travel is also known as circular migration [4]. Circular migration or travel is likely more common among Latinos who are first generation immigrants, citizens, or naturalized residents with strong roots or family ties in Mexico.

The impact of US–Mexico circular migration on Latinos with chronic health conditions such as diabetes has not been well characterized [5, 6]. Latinos in the US have a high prevalence of type 2 diabetes and are at risk of poor diabetes-related outcomes [6, 7]. Latinos with type 2 diabetes have high rates of poorly controlled glycemia [8–11] and diabetes-related complications, including amputations [12, 13]. Primary care physicians who care for this population experience interruptions in patient's use of health services and may plan medical care around their patient's extended travel. Understanding the planning of care around travel is important because diabetes care usually requires multiple prescription medications, management of comorbidities, regular appointments, and regular participation in self-care behaviors [14]. Self-management skills may be of particular importance to migrant populations because continuity of care may not always be possible.

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Frequent or extended travel has the potential to be negatively associated with adherence to pharmacologic therapy and participation in diabetes self-management for patients that already experience poor access to care [3], lack of insurance coverage, low health literacy, and have limited English proficiency [15–18]. Research also indicates that initial migration to the US is associated with poor physical health, psychological distress, and depression [5, 19].

We hypothesize that shifts in social and environmental context contribute to fluctuations in glucose levels, medication adherence, and participation in self-care activities. Research suggests that fluctuations in glucose levels among persons with type 2 diabetes are correlated with coronary artery disease and cognitive function [20–23]. We hypothesize that interruptions in primary care due to circular migration are associated with diabetes management and self-care [3]. The objective of this study was to describe patient participation in self-care activities and diabetes management among diabetic Latinos with circular migration, and assess for differences in demographics and diabetes-related health outcomes among those with and without circular migration.

Methods

We conducted a cross-sectional telephone survey of Latinos with type 2 diabetes from two agricultural counties in central California. Participants were recruited from a large federally qualified health center system that provides health care services to migrant and seasonal agricultural workers and other underserved populations [24]. The survey was conducted between 2009 and 2010 and was administered by trained staff after identifying patients using an electronic diabetes registry. Patients were selected randomly for the survey from patients with diabetes ($n = 5125$) tracked in the diabetes registry which has detailed data on over 90 % of the health system's patients with diabetes. Patients were included in the survey study if they: (1) self-identified as Latino; (2) spoke Spanish; (3) had a current diagnosis of diabetes type 2 based in ICD9-codes; (4) were 18 years of age or older; and (5) had at least two primary care visits in the last 12 months. Of the 367 patients called, 250 completed the survey for a response rate of 68 %. Participants were called up to 15 times and were given a \$20 gift card incentive for completing the 30 min survey. The study was reviewed and approved by the RAND Santa Monica IRB and UCLA.

Respondents were asked about travel and migration over the last 12 months using adapted questions from existing US and Mexico healthcare surveys in the literature [25–28]. All respondents were queried about migration out and

into the US, age, gender, education, marital status, birthplace, yearly household income, insurance coverage status, years with diabetes, and self-reported health status [29]. Medical charts were reviewed to determine the presence hypertension, elevated cholesterol, medications (including insulin use), and hemoglobin A1C levels [25]. But only respondents that traveled were asked about healthcare utilization and interruptions in care: if they had missed doctor's appointments, used less medication, missed an eye doctor's appointment, or missed a medical test because of their migration/travel. Respondents that traveled were also asked categorical (always, often, sometimes, rarely, never, and don't know) items about medication adherence and problems following recommend self-care (following healthy diet, taking prescribed medications, glucose self-monitoring, exercising regularly, and foot exams) during their time away from their community. Respondents that did not travel were not asked about problems participating in self-care activities.

All analyses were conducted using STATA version 12 statistical software. We computed item frequencies and cross tabulations for the survey questions. Categorical items were grouped as always/often/sometimes versus rarely/never to reflect groups that impact clinical care. Differences between groups for categorical variables were calculated using Chi squared tests. Continuous variables were compared using one-way analysis of variance. A P value of <0.05 was determined to be statistically significant.

Results

Twenty-eight percent ($n = 70/250$) of respondents traveled to Mexico and back to US during the last 12 months. Table 1 reports patient demographics and clinical characteristics. Middle age (50–59 years) and older Latinos (≥ 60 years) were more likely to travel. The mean age was 56 years (± 12), 51 % were female, and the median number of times a patient traveled was 1.4 (range = 1–4). Compared to their counterparts that did not travel ($n = 180$), those that traveled ($n = 70$) were more likely to obtain a prescribed medication (3.9 vs. 14.3 %, p value 0.003) from a country outside the US. No other differences in demographics or self-reported health outcomes (Table 1) between respondents that traveled and those that did not travel were statistically significant.

The prevalence of health care utilization and medication use during migration/travel is reported in Tables 2. Twenty-nine percent of participants used less diabetes medication than they wanted to or was prescribed because of travel, and 14 % missed doctor's appointments during their travel.

Table 1 Characteristics of patients with type 2 diabetes who traveled between the United States and Mexico in the last 12 months

Characteristics	Migration in the last 12 months (n = 70)	No migration in the last 12 months (n = 180)	<i>P</i> value*
Demographics			
Age, years (%)			
18–39	5.7	13.9	0.27
40–49	21.4	26.7	
50–59	30.0	26.1	
≥60	42.9	33.3	
Female (%)	50.7	61.7	0.18
Education			
0–6 years completed (%)	72.1	60.2	0.33
7–11 years completed (%)	11.8	20.5	
12 or more years completed (%)	16.2	19.3	
Married or living with someone (%)	76.8	76.4	0.97
Birthplace			
Mexico (%)	84.6	75.6	0.35
United States (%)	13.0	20.0	
Other country (%)	2.9	4.4	
Yearly household income			
0–12,499 dollars (%)	35.6	30.1	0.88
12,500–17,499 dollars (%)	22.2	26.0	
17,500–24,999 dollars (%)	20.0	22.8	
25,000 dollars or more (%)	22.2	21.1	
Insured, any coverage (%)	55.7	56.6	0.87
Self-reported health-outcomes			
Self-reported health status			
Excellent/very good/good (%)	22.7	24.9	0.27
Fair (%)	71.2	62.4	
Poor (%)	6.1	12.7	
High cholesterol (%)	84.3	76.7	0.17
Hypertension (%)	78.6	78.3	0.97
Years with diabetes, mean, (SD)	10.9 (9.1)	8.9 (8.9)	0.17
Insulin use (%)	12.9	11.3	0.94
Hemoglobin A1C, mean (SD)	8.0 (1.8)	7.7 (1.8)	0.32
Prescription medication from Mexico (%)	14.3*	3.9	0.003
Number of times traveled, median (range) ^a	1.4 (1–4)	–	–

* Compares those that travel versus those that did not travel during the last 12 months. Chi square test or one-way analysis of variance tests was used to determine *P* values

^a Values for minimum = 1 and for maximum = 4

The prevalence of use of diabetic supplies, equipment, medications and care planning during migration/travel is reported in Table 3. Twenty-one percent ran out of diabetes medical supplies and 20 % ran out of diabetes medications during their travel. Sixty-one percent of patients rarely/never planned their medical care with their doctor around migration/travel.

The prevalence of patient-reported problems while traveling is detailed in Table 4. The frequency of patient-reported problems while traveling were 39 % for following a diabetic diet, 37 % for glucose self-monitoring, 31 % for taking prescribed medication as directed, 20 % for having diabetes testing supplies needed for self-management, 13 % for exercising regularly, and 7 % for checking feet.

Table 2 Self-reported health care utilization and underuse of medications among patients with type 2 diabetes who migrated between the United States and Mexico (n = 70)

	Response	n (%)
Used less diabetes medication than wanted to, or than was prescribed because of travel	Yes	28.6 % (20)
Missed a doctor's appointments for diabetes because of travel	Yes	14.3 % (10)
Missed an appointment with the eye doctor because of travel	Yes	2.9 % (2)
Needed a blood test or X-ray but didn't get it because of travel	Yes	4.3 % (3)

Table 3 Self-reported use of diabetes supplies, medications, and care planning among patients with type 2 diabetes who traveled/migrated between the United States and Mexico (n = 70)

	Response options	n (%)
Did you ever run out of diabetes medical equipment (such as glucose strips, glucose monitors or insulin syringes) during your travel?	Always/often/sometimes	21.4 % (15)
	Rarely/never	75.7 % (53)
	Don't know	2.9 % (2)
How often have you run out of diabetes medication during your travel?	Always/often/sometimes	20.0 % (14)
	Rarely/never	78.6 % (55)
	Don't know	1.4 % (1)
How often do you plan your medical care with your doctor around your travel?	Always/often/sometimes	38.6 % (27)
	Rarely/never	61.4 % (43)
	Don't know	0.0 % (0)

Table 4 Self-reported problems with self-care activities among patients with diabetes who migrated between the United States and Mexico (n = 70)

Thinking about the last 12 months, how much of a problem were each of the following issues during your travel outside your community?	Problem % (n)	Not a problem % (n)	Don't know % (n)
Following a diabetic diet?	38.6 % (27)	61.4 % (43)	0.0 % (0)
Taking a prescribed medication	31.4 % (22)	68.6 % (48)	0.0 % (0)
Checking you blood for sugar?	37.1 % (26)	62.9 % (44)	0.0 % (0)
Exercising regularly?	12.9 % (9)	80.0 % (56)	7.1 % (5)
Carrying diabetes medical supplies needed for your self-care?	20.0 % (14)	75.7 % (53)	4.3 % (3)
Checking your feet for minor bruises, injuries, and ingrown toenails?	7.2 % (5)	75.7 % (53)	17.1 % (12)

Utilization and participation in self-care outcomes in Tables 2, 3 and 4 were only asked to patients that traveled.

Discussion

This is the first study that we are aware of that examined circular migration between the US–Mexico on the primary care continuum and health behaviors for Latinos with diabetes. Our results suggest that Latinos with diabetes, who traveled out of the US in the last 12 months, have interruptions in care and significant clinical challenges during their migration/travel. We found that participants that migrated/traveled ran out of medications, used less

medication than was prescribed, ran out of diabetes testing supplies (e.g. lancets and glucose meter strips), and found complying with many self-care activities problematic while they were out of the country. Results from this pilot document the prevalence of these interruptions in care as measured among the study's population. If larger studies with comparison groups find similar findings, the clinical implications of the findings may be important to primary care physicians that provide care to Latinos that frequently migrate/travel out of the country. Latinos are a growing population across the US and more primary care physicians across the country will be providing care to this population that may include persons that will travel frequently to their country of origin [2].

Because Latinos are a culturally heterogeneous (e.g. Mexican–American, Cuban, or Puerto Rican) and research among migrant/seasonal agricultural workers is sparse and often focused on regions or communities, it is difficult to compare outcomes from studies in the literature that may appear similar. A review of delivery of health services to agricultural farmworkers identified only one study that considered the degree of mobility of the population [3]. That longitudinal study found that 30 % of agricultural workers in a North Carolina community were mobile over the course of the summer [30]. Although this is similar to the 28 % rate in our study, the community context is different because our study was conducted in California and was a cross-sectional sample of persons receiving care in community health centers.

There are many clinical measures that are sub-optimal among Latinos with diabetes in general, and this likely includes those migrant/seasonal agricultural workers with circular migration [1, 31]. Our findings may help primary care physicians to become aware of lapses in self-care among patients with diabetes who migrate/travel frequently between the US and Mexico. This study serves to help generate hypotheses about the relationship between circular migration and diabetes care. Circular migration or travel may be an important factor contributing to frequent fluctuations in intermediate outcome levels (A1C, high cholesterol, and hypertension), though these outcomes were not different between those with and without migration in this pilot and therefore should be examined in larger studies. Although more research is needed to understand predictors among those that migrate/travel, our results could suggest that doctor-patient coordination around this topic is important. Patients could be educated about this issue because continuity of care in the US and Mexico may not always be possible.

Latinos who are foreign born or first generation immigrants are expected to travel to their country of origin where they likely have extended family and roots. In this pilot study, there was a higher proportion of US born Latinos that did not travel (20 vs. 13 % for foreign born; $P < 0.05$). Circular migration was more common among older Latinos likely because older Latinos may not only hold stronger family and cultural ties to Mexico than do younger Latinos, but they may also have more flexibility to travel due to working less. This study is a unique contribution to the literature on migration among Latinos residing in the US and is one of the first to document the prevalence of diabetes care and management problem areas during migration.

This study has several limitations including a small sample size. The results are subject to recall bias and socially desirable answers. The pilot study is cross-sectional and we cannot infer cause and effect, and are not generalizable to other Latino communities, populations, or geographic areas of the country. The results are also limited by

possible selection bias since we surveyed a group of patients that were accessing primary care in the US and we know that many seasonal or migrant agricultural workers do not have regular access to primary care [3]. Finally, another limitation is that respondents without travel were not asked all the same questions as those that did travel.

With more Latinos residing in the US obtaining permanent resident status, circular migration and travel could be more common. More research is needed to understand how regular interruptions in care are associated with clinical and patient-related diabetes outcomes, and to explore the underlying reasons for the findings. But the results from this study suggest that how we structure care and coordination with physicians may be important for this low-income population with diabetes.

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Compliance with Ethical Standards

Conflict of interest None.

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