Assessing Barriers to Medication Adherence Among Latinos with Diabetes: a Cross-sectional Study

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INTRODUCTION

Latino adults have higher diabetes rates (12.8%) than non-Latinos (7.6%) and are more likely to have suboptimal glyce-mic control.¹ Medication adherence can impact morbidity and mortality from diabetes.² Prior research demonstrates that improving medication adherence among patients with chronic diseases is challenging and that Latino populations may be less adherent to medications than non-Latinos.^{1, 3} One study found that 37% of Latinos had high scores on Morisky Med-ication Adherence Scale versus 50% of non-Latinos, indicat-ing poorer adherence among Latinos.⁴

In this study, we interviewed Latinos with diabetes to iden-tify modifiable barriers to medication adherence that might be amenable to intervention.

METHODS

This cross-sectional study assessed patients' perspectives about their challenges with medication adherence. Eligible patients were identified from four safety-net clinics in Los Angeles. From June 2017 to March 2018, patients meeting the following criteria were eligible for the study: age ≥ 18 , self-identified as Latino/Hispanic/Chicano, diagnosed with diabetes for ≥ 6 months, and taking ≥ 1 diabetes medication. Investigators administered the survey to 30 patients at each site, for a total of 120 patients.

The questionnaire included demographic and Likert scale questions about medication adherence barriers and proposed interventions (Appendix). Participants completed the questions

independently or with help from the investigator. Upon comple-tion of the survey, participants received a \$10 gift card.

Survey responses were recorded using Redcap software and analyzed using SPSS. The dependent variable for our analyses was controlled diabetes ($\text{HbA1c} < 7.5\%$) vs. uncontrolled diabetes ($\text{HbA1c} \geq 7.5\%$). We chose a threshold $\text{HbA1c} \geq 7.5\%$ because when this study began, most major diabetes treatment guidelines recommended a HbA1c target $< 7.0\%$, but due to emergent data suggesting a less aggressive target, we opted for a more lenient threshold. With 120 participants, our study had a power of 76% to detect a difference in reported adherence rates of 0.24 on the Likert scale between partici-pants with controlled vs. uncontrolled diabetes.

This study was approved by the University of Southern California's Institutional Review Board (HS-17-00414).

RESULTS

Table 1 provides demographic characteristics of our study population ($n = 120$). Most subjects were female, Spanish-speaking, with an average age of 60, and with minimal formal education. On average, our patients took 6.5 prescribed med-ications daily and the majority (62%) had a $\text{HbA1c} \geq 7.5$.

Table 1 Demographics of Study Participants ($N = 120$)

Variable	N
Sex	
Male	46 (38%)
Female	74 (62%)
HbA1c	
< 7.4	46 (38%)
≥ 7.5	74 (62%)
Age	Mean $\pm$ SD (range)
Health insurance	60 $\pm$ 12 (24–88)
Public	104 (87%)
Private	7 (6%)
No insurance	5 (4%)
Other/do not know	4 (3%)
Education ($N = 119$)	
No school–middle school	87 (73%)
Some HS–HS	22 (19%)
College and above	10 (8%)
Years outside the USA ($N = 104$) (range)	Mean $\pm$ SD
Language ($N = 119$)	34 $\pm$ 12 (10–70)
English	6 (5%)
Spanish	102 (85%)
English and Spanish	11 (9%)
Daily medications (range)	Mean $\pm$ SD
	6.5 $\pm$ 3.1 (1–15)

Prior Presentations American College of Physicians Southern California Chapters Scientific Meeting 2017, American Medical Association and Network of Ethnic Physician Organizations 2017 Building Healthy Com-munities Summit, Southern California Public Health Association Annual Conference 2017, Innovations in Medical Education Conference 2018, Latino Medical Student Association (LMSA) West Regional Conference 2018, and the National Hispanic Medical Association Conference 2018.

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Table 2 Patient Views Regarding Medication Adherence

A. Barriers to medication adherence for patients with controlled vs. uncontrolled diabetes			
Surveyed barriers	N	OR (95% CI)	
It is difficult for me to keep track of when to take all my medications	120	3.13 (1.32, 7.41)	
It is difficult for me to understand what each of my medications is for	120	2.74 (1.19, 6.34)	
I do not take my medications because I fear the side effects	120	0.99 (0.30, 3.25)	
I feel stressed, anxious or in a low mood about my illness	120	2.19 (0.94, 5.09)	
I feel that I take too many medications	120	2.41 (1.14, 5.13)	
I understand how uncontrolled diabetes affects my health long term	120	1.17 (0.34, 3.92)	
My prescription is in my preferred language	119	1.36 (0.39, 4.75)	
I cannot afford to buy my medication and/or diabetic supplies	119	1.61 (0.74, 3.48)	
B. Patient views regarding interventions to improve medication adherence			
Surveyed interventions	N	% agree (95% CI)	
How helpful would it be to follow your prescription given a personalized picture prescription? (see image for example)	120	71.7 (63.0–79.0)	
How helpful would reducing your number of medications be?	118	70.3 (61.6–77.8)	
How helpful would it be if your family members understood your medication regimen?	120	78.3 (70.1–84.8)	
How helpful would it be to have weekly conversations with a personal health coach to gain better control of your diabetes?	120	72.5 (63.9–79.7)	
How helpful would it be to attend weekly education sessions to learn more about managing your diabetes through lifestyle changes?	120	75.8 (67.5–82.6)	
To what extent do you feel that meeting with community members/peer support groups would help you?	120	74.2 (75.7–81.2)	
How helpful would it be if you were given a pillbox for your medications?	119	82.4 (74.5–88.2)	

Table 2 summarizes patient views regarding barriers to medication adherence. Of note, patients with out-of-control diabetes had 3.3 greater odds compared with those with diabetes under control of agreeing that “it is difficult to keep track of when to take all medications” (95% CI 1.32, 7.41). Also, patients with out-of-control diabetes had 2.74 higher odds of agreeing that “it is difficult for me to understand what each of my medication is for” (95% CI 1.19, 6.34). Furthermore, patients with out-of-control diabetes had 2.41 higher odds of agreeing that “I feel that I take too many medications” (95% CI 1.14, 5.13).

The majority of respondents from both groups (HbA1c $\geq 7.5\%$ and $< 7.5\%$) believed that all of the proposed specific interventions could reduce barriers to diabetes medication adherence. These include personalized picture prescriptions, weekly health education classes, and medication pill boxes (see Table 2B).

DISCUSSION

Our analysis identified several barriers to diabetes medication adherence associated with suboptimal glycemic

control. In particular, patients who struggled to keep track of their medications, those uncertain about what their medications are for, and those who believe they take too many medications were substantially more likely to have out-of-control diabetes. Previous studies also indicate that the better a patient understands their medications, the better they will manage their disease.³ Also consistent with our results, Polonsky et al. found that both treatment complexity and convenience are key contributors to decreased adherence.³

Our findings suggest several potential approaches for improving medication adherence among Latinos with poorly controlled diabetes. The data indicate that interventions aimed at helping patients keep better track of their medications, educating patients about the treatment indications for their medications, and reducing unnecessary medications all might enhance adherence. Future research should assess the value of such interventions among Latinos with diabetes.

In summary, our results demonstrate that Latino patients with diabetes face substantial barriers to medication adherence, which may adversely impact glycemic control. Our data offers insight into future prospective research evaluating interventions for improved medication adherence in the Latino community.

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Compliance with Ethical Standards:

This study was approved by the University of Southern California's Institutional Review Board (HS-17-00414).

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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APPENDIX

DIABETES PATIENT WELLNESS SURVEY					
Demographic Questions:					
1. Do you identify as Latino/Hispanic/Chicano? Yes No					
2. What is your age?					
3. Sex. Male Female Other					
4. Ethnicity.					
Mexican Salvadoran Guatemalan Honduran Nicaraguan Dominican Peruvian Other:_____					
5. If not from the USA, how many years have you lived in the USA?					
6. Are you a permanent resident or citizen? Yes No					
7. What is the highest degree or level of school you have completed?					
Elementary School Middle School Some High School High School Diploma/GED Some College College Degree or Beyond					
8. What language are you most fluent in/prefer?					
Spanish English Both Other:_____					
9. Please circle the option that best describes your health insurance.					
Medi-Cal Medicare My Health LA Private Insurance No Insurance I do not know Other:_____					
10. What was your age when you were diagnosed with diabetes?					
11. How many medications are currently prescribed to you?					
PLEASE DO NOT WRITE BELOW, THIS IS FOR INVESTIGATOR PURPOSE ONLY					
Hemoglobin A1c & Date Measured			Patient #		

For each item identified below, use the scale to the right and circle the number that best fits your judgment.					
Statement	Scale				
	Strongly Disagree	1	2	3	4
12. It is difficult for me to keep track of when to take all my medications.	1	2	3	4	5
13. It is difficult for me to understand what each of my medications is for.	1	2	3	4	5
14. I do not take my medications because I fear the side effects.	1	2	3	4	5
15. I feel stressed, anxious or in a low mood about managing my illness.	1	2	3	4	5
16. I feel that I take too many medications.	1	2	3	4	5
17. I understand how uncontrolled diabetes affects my health long term.	1	2	3	4	5
18. My prescription is in my preferred language.	1	2	3	4	5
19. I cannot afford to buy my medication and/or diabetic supplies (test strips and lancets, etc.)	1	2	3	4	5

Question	Scale				
	Not Very Helpful At All	1	2	3	4
20. How helpful would it be to follow your prescription given a personalized picture prescription? (see image for example)	1	2	3	4	5
21. How helpful would reducing your number of medications be?	1	2	3	4	5
22. How helpful would it be if your family members understood your medication regimen?	1	2	3	4	5
23. How helpful would it be to have weekly conversations with a personal health coach to gain better control of your diabetes?	1	2	3	4	5
24. How helpful would it be to attend weekly education sessions to learn more about managing your diabetes through lifestyle changes?	1	2	3	4	5
25. To what extent do you feel that meeting with community members/peer support groups would help you?	1	2	3	4	5
26. How helpful would it be if you were given a pillbox for your medications?	1	2	3	4	5

Please use this space to share any comments and/or other challenges you have in taking care of your diabetes:

Thank You for Your Participation in This Survey