Published in final edited form as:

J Immigr Minor Health. 2019 December ; 21(6): 1334–1341. doi:10.1007/s10903-019-00867-9.

Factors Impacting Adherence to Diabetes Medication Among Urban, Low Income Mexican-Americans with Diabetes

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Abstract

Mexican-Americans carry a high burden of type 2 diabetes and are disproportionately affected by diabetes related mortality and morbidity. Poor adherence to medication is an important barrier to achieving metabolic control and contributes to adverse health outcomes and health disparities. Little is known about barriers and facilitators to medication adherence among Mexican-Americans with diabetes. This is a qualitative study of semi-structured interviews with a sample of 27 adults (25 Mexican-Americans and 2 Latinos of other origin) with self-reported type 2 diabetes who were recruited as part of a church-based, randomized controlled trial for diabetes self-management education in a low-income, immigrant neighborhood of Chicago. Face-to-face, in-depth interviews were conducted (one in English and 26 in Spanish), audio-recorded, transcribed verbatim, and professionally translated. Systematic qualitative methods were used to analyze interviews. All 27 participants were Latino, and 25 were of Mexican descent. Participants' mean age was 57 years, 81% were female, 69% had an annual income less than \$20,000 and 48% had no health insurance. Mean A1C level was 8.6% and mean systolic blood pressure was 125 mmHg. The majority of participants (85%) reported using oral diabetes medication and 35% reported taking insulin. 76% reported being affiliated with one of the two partnering catholic churches based in the South Lawndale neighborhood of Chicago, also known as Little Village. Concerns regarding effectiveness and negative impact of diabetes medication were prevalent and expressed by 13 (48%) of 27 participants. Dissatisfaction with ineffective provider communication and not being able to pay for medication were other important barriers to adherence and were expressed by 7% and 11% of participants, respectively. Family support, for example, family members assisting in organizing medications in boxes and reminding participants to take them, was reported by 15% of participants and emerged as an important facilitator to medication adherence. There is a gap in research on factors influencing adherence to diabetes medication among Mexican-Americans. Our study suggests that concerns regarding negative impact of diabetes medication and concerns

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Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s10903-019-00867-9>) contains supplementary material, which is available to authorized users.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

regarding effectiveness are prevalent barriers to adherence. These barriers can be addressed through educational efforts targeting patients and clinicians by specifically including content on beliefs that lead to poor adherence in diabetes self-management interventions for patients and continuing medical education for providers and by developing interventions that engage family members as a support system for medication adherence.

Keywords

Mexican-Americans; Diabetes; Medication adherence

Introduction

Mexican-Americans are disproportionately affected by type 2 diabetes, have worse glycemic control, and suffer from higher rates of diabetes-related complications compared to non-Hispanic Whites [1–3]. Oral diabetes medications and insulin are effective strategies to achieve metabolic control and improve health outcomes, but optimal adherence to diabetes medication and appropriate intensification is necessary to obtain the full health benefit [4–6]. Previous studies of adherence to diabetes medication demonstrated that a 10% decrease in adherence is associated with a 0.14% increase in glycosylated hemoglobin (A1C) [7] and that inadequate adherence is associated with increased rates of emergency department visits and hospitalizations [8]. Non-adherence may also be a significant independent predictor of racial and ethnic disparities in poor metabolic control [9].

Previous research has identified that medication adherence is determined by a variety of interrelated factors, including medication beliefs, disease knowledge, access to healthcare, comorbidities, social support, and socio-demographic factors [10], but little is known regarding adherence rates and factors that influence adherence among Mexican-Americans with type 2 diabetes [11]. Only four studies that explored adherence to diabetes medication sampled Latinos and found non-adherence rates between 28 and 60% [12–14]. Venturini et al. studied a population served by the Kaiser Permanente in Southern California and found that treatment complexity and being newly treated for diabetes were inversely associated with adherence [13]. In a study by Kuo et al. older age (> 75 years) and lack of health insurance were associated with lower adherence [14]. Mann et al. found that the belief that medicine is not necessary when blood sugar levels are normal, concerns about side effects, and the perception that medicines were hard to take were predictors of poor adherence [15]. A qualitative study that explored barriers to medication management for chronic diseases among Mexican-Americans identified confusion about medication instructions, ineffective communication with providers and distrust in the healthcare system as the main barriers to adherence [16].

Medication adherence is such a critical component of metabolic control among adults with diabetes. Given that Latinos have disproportionately high rates of diabetes diagnoses and suboptimal glycemic control, it is important to study factors that determine medication adherence in this population. This study aimed to explore barriers and facilitators to adherence among low-income, urban Latinos. Findings from this study can help inform

strategies to improve diabetes self-management, improve health outcomes and reduce health disparities.

Methods

Study Setting

This qualitative study was a part of a randomized controlled, pilot study for the improvement of diabetes self-management among Latinos. “Picture Good Health/Imagínate una Buena Salud” was a church-based study in South Lawndale, a predominantly Latino neighborhood of Chicago [17]. Participants were recruited at church-based events in the community and randomized to either the intervention or the control arm. The intervention arm consisted of eight weekly 90-min group classes that took place at the two partnering churches and were led by two trained lay leaders. The curriculum was based on self-determination theory that emphasizes the importance of intrinsic motivation that underlies behavior change. The weekly classes incorporated information about diabetes and topics on nutrition and physical activity. The enhanced usual care arm was the control arm where participants were invited to a 90-min lecture on diabetes self-management by a bilingual chronic disease health educator during the study period. At the end of the 6-month study period, participants in the enhanced usual care arm were invited to a less intensive 8-week group education class for equity purposes. The “Picture Good Health/Imagínate una Buena Salud” study did not have a dedicated section on medication adherence in the curriculum since the classes were taught by peer leaders who were not medically trained. However, participants were asked to speak with their medical providers about questions related to diabetes medication. Details of the intervention study have been described elsewhere [17].

Data Collection and Analysis

Of the 100 participants who were enrolled in the “Picture Good Health” study, 30 participants were contacted to complete post-intervention interviews. Interviews were conducted by trained research assistants in a private room at a local health center. The interviews lasted 45–60 min and were conducted between July 2012 and February 2013 after participants had completed the 6-month study. Due to an administrative error during recording, three interviews of intervention participants could not be analyzed. Of the 27 interviews analyzed, one was conducted in English and 26 were conducted in Spanish. Ten participants were from the enhanced usual care arm and 17 were from the intervention arm. All of the participants interviewed had completed the study. The interviewees received a healthy recipe book and a disposable camera upon completing the audio-recorded interview. The bilingual interviewer followed a semistructured questioning guide (see Online Appendix 1) which was informed by the Social Ecological Model in the context of Type 2 Diabetes Prevention and Management [18]. The main objective of the interview was to explore beliefs and behaviors surrounding diabetes self-management and receive feedback on the intervention. All sessions were audio-recorded and transcribed verbatim into text files. Spanish interviews were professionally translated to English. Interviews were imported into HyperRESEARCH 3.7.2 software for analysis (Researchware, 2007, Randolph, MA, <http://www.researchware.com/products/hyperresearch.html>). The University of Chicago Institutional Review Board approved all study procedures.

Data Analysis

Three research staff (AB, PF, SB) independently reviewed and coded the interviews, met to discuss their coding schema, and developed an initial codebook. The interviews were then analyzed using a modified template approach where coding was guided by the initial codebook, which was further developed and amended as themes emerged during data review. Code reports listing all segments assigned to each code were generated in HyperRESEARCH. Each code report was assigned to one of the three reviewers for a more in-depth analysis to identify subthemes within each of the larger themes. The reviewers developed a list of sub-themes and representative quotes within the codes they were assigned and discussed the list of subthemes for each of their codes with the other two reviewers. Based on the discussion, the reviewer went back and refined the list of subthemes for each of the codes they were assigned, and coded the segments using the finalized list of subthemes. All codes and subtheme codes were then entered by a trained research assistant into HyperRESEARCH.

Results

Participant Characteristics

Participants' mean age was 57 years (Table 1), 81% were female, 70% had less than a high school diploma, 69% had an annual income less than \$20,000 and 48% had no health insurance. All 27 participants were Latino, and 25 were of Mexican descent. Mean A1C level was 8.6% and mean systolic blood pressure was 125 mmHg. The majority of participants (85%) reported using oral diabetes medication and 35% reported taking insulin. Mean duration of diabetes was 8.8 years.

Qualitative Results

Many barriers and facilitators to medication adherence emerged from the interviews, including beliefs, perceptions, and attitudes about diabetes medication and external factors. Barriers and facilitators were organized according to the conceptual model of the interview guide.

Personal Barriers

Unwanted Medication Effects—One important, frequently encountered belief that led to non-adherence was that the side effects of diabetes medication were not worth the benefits (Table 2). Concerns regarding negative effects of diabetes medication were prevalent and expressed by 13 (48%) of 27 participants. Some participants reported forgoing their medications because of specific side effects, for example stomach pain, hypoglycemia or restlessness, while others described an unspecific negative effect. One participant noted:

The medicine wouldn't sit well with me and I stopped. Many, I went 3 or 4 years without medicine.

Utility of Medication—Other barriers to adherence were beliefs that medication is not necessary.

I have had the medication but rarely do I take the tablets that they gave me because I don't feel that it is necessary.

One participant specifically shared that he did not observe any therapeutic effects of the medicine, so it made no difference whether he took the medication or not.

With or without medicine, I feel fine. I take it and I feel the same. I don't take it and I still feel the same.

Desire to Control Diabetes with Lifestyle Instead of Medication—The belief that with a healthy diet and exercise there is less need for diabetes medication emerged as another important barrier to adherence. Some participants expressed their determination to control their diabetes with lifestyle instead of medications.

I keep struggling with medication. I always try not to take medication... I want to try to do it more than with medication, with food. I know that medication is a main part for us. So, this is what I am struggling to do. He [the doctor] told me that if I am not going to control my sugar again he was going to put me on insulin. And I told him no, that I am going to control it with my diet.

Interpersonal Barriers

Poor Communication with Providers—Poor communication with providers was another barrier to medication adherence expressed by 7% of participants. Some participants expressed frustration about lack of information about side effects and the rationale for intensification of medication regimens. One participant noted:

I have little faith in her [the doctor]. It's like, I feel that ... I am not even taking them [the medication]. Not how she told me. Because it's too many pills. And I told her: "Hey" and I told her "Hey doctor, doesn't it affect my lungs, my." [the doctor]: "Right now they [the lungs] are fine", just like that. I mean, come on.

Personal Facilitators

Importance of Diabetes Medication—Many participants acknowledged the importance of diabetes medication for their health outcomes (Table 3). The most frequently cited facilitator of adherence was the belief that taking medication as recommended is important to maintain a good health status.

I take my medicine regularly at the times my doctor has told me to. Because [of] that, I am doing very well. The medications that she [the doctor] has prescribed, have helped me a lot.

Interpersonal Facilitators

Discussing Adherence with Providers—An important facilitator of adherence pertains to interaction with providers. Participants reported that their adherence improved after their provider addressed it.

I would only take it [the medication] when I would remember. I would take it every other day. Then, the doctor asked me if I took it every day. I was reluctant to

answer, but I knew it was for my own good. One day I told him that. He told me, “You’ll never improve like that. You have to take it daily and the times I have indicated.” That is the reason why my sugar levels, cholesterol and blood pressure have improved.

Family Support—Family support emerged as another critical facilitator of adherence. Of 27 participants 4 (15%) reported how family members helped them organize their medications in boxes and reminded them to take their medications.

Yeah, she [daughter] arranges them [the medication] for me so that I don’t, I don’t forget. So I can’t say “Well, today I won’t take them”

Societal Barriers

Cost—Of 27 participants, 3 (11%) reported forgoing their medication because they could not pay for it.

I couldn’t buy the medicine where I tell you they sent me. So then I didn’t even go and I went about 3 months without medicine.

They charged me too much for the medicine and I didn’t have enough and well, I couldn’t go anymore.

Discussion

Adherence to diabetes medication is an essential step in achieving glycemic control and improving health out-comes. Although Latinos are disproportionately affected by diabetes, have worse glycemic control, and suffer from higher rates of diabetes-related complications compared to non-Hispanic Whites [1–3], little is known about barriers and facilitators to medication adherence in this population.

Our study participants expressed the desire to control diabetes with lifestyle instead of medication. This is an interesting finding that has not been previously reported in the literature and may reflect a unique barrier to medication adherence among Latinos. According to the recommendations of the American Diabetes Association, exercise and diet are the cornerstone in the management of type 2 diabetes and if glycemic control is not achieved with these lifestyle modifications, medications should be used to augment, not replace, lifestyle changes [19]. Studies show that Latinos are less likely than non-Hispanic whites to perform adequate physical activity [20] and that 40% of Mexican Americans reported no leisure time physical activity [21, 22]. Further, many Latinos consume high amounts of carbohydrates and fat and low levels of vegetables and thus do not meet recommended dietary guidelines [23, 24]. Further research is needed to support our findings and better understand beliefs and perceptions regarding the importance of lifestyle versus medication for diabetes control among Latinos.

Our study found that unwanted effects of medication and concerns regarding utility were important factors that decreased adherence. This finding is similar to the study done by Mann et al. among a predominantly Latino population that reported patient concerns regarding side effects of medication and skepticism about the necessity of medication to be

independent predictors of adherence [15]. It suggests specific concerns regarding effectiveness of medication and overall skepticism regarding medication may be a particularly prevalent phenomena among Latinos. Our results have important implications for diabetes care for Latinos in urban settings.

Educating providers about the impact of medication beliefs on adherence and the importance of routinely inquiring their patient's medication beliefs could be an important first step in improving adherence. If concerns and skepticism are present among patients, providers could deliver specific educational messages on medication efficacy and the importance of consistent medication adherence for diabetes-related health outcomes. Similarly, public health interventions that aim at educating patients on diabetes self-management need to include modules where patient's beliefs and perceptions are addressed and discussed.

The findings of this study suggest that poor communication with providers is a barrier to adherence. Little is known about the impact of provider communication on adherence to diabetes medication among Latinos. Research among non-Latino populations indicates that effective provider-patient communication can substantially improve the patient-provider relationship and facilitate adherence [14, 17] because it helps build a collaborative environment based on mutual trust and agreement, which allows patients to openly discuss their challenges and concerns. Effective communication with providers, however, may be challenging for Latinos who experience language barriers [25]. For Latinos, language barriers may also exacerbate adherence problems by compromising understanding of the medication regimen. Lack of comprehension of medication instructions is likely one of the pathways through which limited English proficiency leads to poor outcomes. This is supported by a recent population-based study which showed that Latino patients with limited English proficiency were more likely to have poor glycemic control after controlling for demographic and clinical confounders [26]. Mohan et al. suggest the utilization of illustrated medication instructions may be an effective strategy to increase accessibility of medication information for patients with limited health literacy since difficulties understanding medication instructions are an important barrier to proper adherence among Latinos [16].

Family was the most prevalent source of support for adherence. Guénette et al. [27] described support from spouses and children to be one of the most important factors to improve adherence and other aspects of self-management such as nutrition and physical activity among a group of patients with diabetes in Quebec, Canada. There is a lack of research about the role of family support for adherence to diabetes medication among Latinos. Our participants described how their relatives supported them in various aspects of medication management, for example through reminding them to take the drugs or helping them to organize their medication. These findings emphasize the importance of family as a valuable resource that should be incorporated in diabetes self-management interventions, for example, through inclusion of family members in educational interventions [24].

Cost of medication is a known barrier to adherence and although individuals with health insurance are less likely to experience cost as a barrier compared to those who are uninsured, rates of cost-related medication non-adherence are as high as 15% even among insured populations [28]. The majority of our study participants have an annual income below

\$ 20,000 and are uninsured. Cost emerged as a prevalent barrier to medication adherence in our sample. A recent population-based study documented that Hispanics are more likely to experience cost-related medication non-adherence as well as food insecurity compared to non-Hispanic Whites [29]. Given the economic hardship faced by many Latino individuals with type 2 diabetes, policy-based efforts are needed that address social determinants of health in this population.

Our study has several limitations. Participants were a convenience sample recruited in community and church events and may not be representative of the Mexican-American population. Participation and completion of the intervention study may have influenced responses of interviewees. Lastly, the findings of this qualitative study were incidental, since the interview guide did not directly or specifically ask about medication adherence. However, these themes regarding barriers and facilitators to medication adherence emerged from our analysis.

Conclusion

There is a gap in research on factors influencing adherence to diabetes medication among Latinos. Our study suggests that the desire to control diabetes with lifestyle modifications rather than with medications, concerns regarding negative impact of diabetes medication and doubts regarding effectiveness are particularly prevalent factors that decrease adherence among Latinos. These factors are potentially modifiable through educational efforts targeting patients and clinicians. Modules on the impact of medication beliefs could be incorporated in health education for patients (for example as part of diabetes self-management interventions) and for clinical providers (for example as part of continuing medical education). Future research should focus on developing culturally sensitive educational content for patients which address beliefs that lead to poor adherence among Latinos, on incorporating modules on the impact of medication beliefs on adherence in continuing medical education for clinicians, on the development of interventions that engage family members as a support system for medication adherence and lastly, on investigating the impact of these efforts on adherence and diabetes outcomes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Participant characteristics, N = 27

Demographics	
Age (mean, SD)	57 (11)
Female (n, %)	22 (81)
Married (n, %)	15 (56)
Less than high school diploma/GED (n, %)	19 (70)
Income < \$20,000	18 (69)
Years in United States (mean, SD)	28 (15)
Speak only Spanish at home (n, %)	25 (93)
Health care access	
Have health insurance (n, %)	14 (52)
Have a usual source of care (n, %)	25 (93)
Health status	
Duration of diabetes in years (mean, SD)	11 (7)
Presence of comorbidities	24 (89)
Hypertension	17 (63)
Renal disease	2
Coronary heart disease	1
Retinopathy	11 (41)
Depression	4 (15)
Self-reported overall health status (n, %) ^a	
Good	7 (27)
Fair	10 (38)
Poor	9 (35%)
Medications	
On oral diabetes medication (n, %)	23 (85)
On insulin (n, %)	9 (35)
On other injectable diabetes medication (n, %)	2
Clinical measures	
Glycosylated hemoglobin (A1C) (%) (mean, SD)	8.6 (2.2)
Systolic blood pressure (mmHg) (mean, SD)	125 (14)
Diastolic blood pressure (mmHg) (mean, SD)	72 (12)
Mean body mass index (BMI) (mean, SD)	32 (6)

^aNo patients chose "Excellent" or "Very good"; Information missing for one participant

Table 2

Factors decreasing medication adherence

Themes	Example quotations
Belief: diabetes medication has unwanted effects	<p>"I took the medication for less than a month. It had a bad effect on me. I would feel really ill when I would take it. So, I stopped taking it."</p> <p>"Everytime I go, well he [the doctor] increases my medicine. And that is not good for me. I don't feel that it is."</p> <p>"The medicine wouldn't sit well with me and I stopped. Many, I went 3 or 4 years without medicine."</p>
Cost	<p>"I couldn't buy the medicine where I tell you they sent me. So then I didn't even go and I went about 3 months without medicine."</p> <p>"They charged me too much for the medicine and I didn't have enough and well, I couldn't go anymore."</p> <p>"Sometimes you don't have money for your medicine."</p>
Belief: diabetes medication is not necessary/not effective	<p>"I have had the medication but rarely do I take the tablets that they gave me because I don't feel that it is necessary."</p> <p>"With or without medicine, I feel fine. I take it and I feel the same. I don't take it and I still feel the same."</p>
Poor communication with providers	<p>"I have very little faith in her. It's like, I feel that I...I'm not even taking them [the drugs].. Not how she told me, because it's too many pills. And I told her, "Hey." And I told her, Hey, doctor, doesn't it affect my lungs, my. Right know, they are fine, just like that. I mean, come on."</p> <p>"I had a bad experience with a doctor. The doctor I was assigned to at [...], I wanted to ask him: Doctor, I don't like this medication, I don't feel well. He did not tell me: You can take this other one. He did not tell me anything. You have to take it and if you want to take it. I did not like his attitude and the situation that if I don't have a good relationship with the doctor, I did not go to the doctor."</p>
Belief: lifestyle has larger impact on diabetes control than medication	<p>"I keep struggling with medication. I always try not to take medication... I want to try to do it more than with medication, with food. I know that medication is a main part for us. So, this is what I am struggling to do."</p> <p>"He [the doctor] told me that if I am not going to control my sugar again he was going to put me on insulin. And I told him no, that I am going to control it with my diet."</p> <p>"The key is to walk. If you walk you have solved your problem. The portion of food that I eat here, I eat over there, and by walking, because over there I walk a ton and even later, there have been times when the <i>set of pills</i> I need to take I do not even take because I am far from home and this and that, and it [my blood sugar] does not go up."</p>

Table 3

Factors increasing medication adherence

Themes	Example quotations
Belief diabetes medication is important to maintain a good health status	<p>"I have learned to take the medicine like the doctor had explained. That's why I have improved so much."</p> <p>"I continue to take two pills. I take them now. I've improved significantly. Honestly I wouldn't go down from 180, 170, 200, 190, 200. I would check myself every day and I was the same. Why? I'm taking the medicine."</p> <p>"Look, with the medications they have prescribed for me, they have me under control."</p>
Family support	<p>"I look sometimes and 'Honey, when you see that I haven't taken my medicine, bring them to me, give them to me, scold me'. And she'll say "Yes, Mommy, Yes. Like that. Mommy. Your medicine."</p> <p>"My daughter bought some little boxes like this one....She arranges everything for me so that I don't, I don't forget. So I can't say, Well, today I won't take them. I don't know why there are so many pills, but that's all."</p>
Providers inquiring medication adherence	<p>"I would only take it [the medication] when I would remember. I would take it every other day. Then, the doctor asked me if I took it every day. I was reluctant to answer, but I knew it was for my own good. One day I told him that. He told me, 'You'll never improve like that. You have to take it daily and the times I have indicated. That is the reason why my sugar levels, cholesterol and blood pressure have improved.'"</p>