Concepts of diabetes self-management in Mexican American and African American low-income patients with diabetes

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Abstract

The goal of the study was to explore low-income minority patients’ concepts of diabetes self-management and assess the extent to which patient beliefs correspond to evidence-based recommendations. African American and Mexican American patients with type 2 diabetes were recruited from safety net clinics that serve the uninsured and under-insured in Chicago and San Francisco to participate in focus group discussions. Grounded theory was used to identify themes related to diabetes self-management. Strategies participants mentioned for diabetes self-care were medication use, diet, weight loss and exercise. Eating more fruit and vegetables and consuming smaller portions were the most commonly mentioned dietary behaviors to control diabetes. African Americans expressed skepticism about taking medications. Mexican Americans discussed barriers to acquiring medications and use of herbal remedies. Mexican Americans frequently mentioned intentional exercise of long duration as a management strategy, whereas African Americans more frequently described exercise as regular activities of daily living. Blood glucose self-monitoring and reducing risks of diabetes complications were rarely mentioned as diabetes self-management behaviors. African American and Mexican American patients have different concepts of diabetes self-management, especially with regard to medication use and physical activity. Consideration of these differences may facilitate design of effective self-management interventions for these high-risk populations.

Introduction

Mexican Americans and African Americans are almost twice as likely as non-Hispanic whites to be diagnosed with type 2 diabetes [1]. Mexican American and African American diabetic patients, especially those with lower socioeconomic status (SES), are more likely to suffer from diabetes complications [2], in part because they are less likely to achieve glycemic control [3, 4]. Glycemic control and risk of diabetes complications are largely dependent on effective self-management [5]. Lower-income black and Hispanic patients are less likely to engage in diabetes self-management behaviors than higher income whites, which may partially explain ethnic and socioeconomic disparities in diabetes outcomes [6, 7]. Less effective diabetes self-management may result, at least in part, from patients’ lack of understanding about how to effectively manage their diabetes. The current study provides an in-depth exploration of beliefs among low-income African American and Mexican American diabetic patients about how to manage their diabetes and compares patient beliefs to evidence-based recommendations for diabetes self-management.
Evidence-based recommendations for diabetes self-management have been summarized by the American Association of Diabetes Educators (AADE) into seven key behaviors [8]: being active, healthy eating, medication taking, monitoring of blood glucose, problem solving, especially for high and low levels of blood glucose, reducing risks of diabetes complications and psychosocial adaptation to living with diabetes. American Diabetes Association (ADA) nutrition recommendations include weight loss or energy restriction, monitoring of carbohydrate intake, high fiber intake, limitation of saturated fat, trans fat, cholesterol, and sodium and consumption of fish twice per week [9].

There are a number of reasons to suspect that patient beliefs about diabetes self-management will differ from evidence-based recommendations. First, many diabetes patients lack confidence in their knowledge about how to eat and exercise in order to most effectively manage their diabetes [10–13]. Some evidence with low-income African American adults suggests that people may have superficial knowledge of what a healthy diet is, but lack the detailed knowledge necessary to actually implement a healthy diet [14, 15]. For example, many adults can identify which nutrients are unhealthy (e.g. fat, sodium), but lack knowledge of which foods contain those nutrients [14, 16]. Knowledge about nutrients is unlikely to impact health if it is not translated into knowledge about specific foods to eat. In another study, older adults cited eating right and exercise as two of the most important behaviors for maintaining health, but when asked, they were unable to specify the foods that make up a healthy diet and defined ‘taking exercise’ as moving around, rather than as the more vigorous exertion necessary for cardiovascular benefit [17]. Superficial knowledge that ‘diet’ and ‘exercise’ are important for diabetes self-management is not sufficient to support actual behaviors that can improve health.

Studies on patient beliefs about treatment for diabetes show that the most commonly mentioned treatment for diabetes is medication. Diet and exercise are often mentioned by patients as ways of treating diabetes, although few studies describe specific, actionable patient knowledge about diet and exercise (i.e. what specific foods are healthy or unhealthy) [11, 13, 18]. Other studies show that, while patients mention diet and exercise as self-management behaviors, they doubt that diet and exercise are effective and are less likely to adhere to diet and exercise recommendations than to medications [19–21]. Patients’ lack of confidence in the effectiveness of diet and exercise to affect their diabetes may be due to the fact that their knowledge about diet and exercise self-management is not detailed enough to support effective self-management behavior. Confusion about what foods to eat and how to stay healthy has been associated with poorer health behaviors [22, 23].

Knowledge about diabetes self-management may lack the specificity necessary to support effective self-care behavior. In addition, some evidence suggests that the goals of diabetes self-management may also differ between patients and providers [18, 24–28]. For providers, the goal of diabetes self-management is achievement of glycemic control and avoidance of complications, but for patients the goal is to feel healthy and maintain social relationships [18, 20, 26, 27]. Given these differences in patient and provider views of self-care, and the importance of providing patient-centered diabetes care [29], it is important to better understand patient perspectives on self-care.

We conducted a qualitative study to explore concepts of diabetes self-management among African American and Mexican diabetes patients of two large public hospitals. The goal of the study was to develop hypotheses about knowledge gaps that might be targeted in diabetes self-management interventions with African Americans and Mexican Americans. Because our study was designed to generate hypotheses, rather than test hypotheses, we used a grounded theory approach [30]. First, we used open-ended questions to explore patients’ beliefs. Second, we used constant comparative analysis to organize the data into a set of common patient beliefs for each ethnic group. Finally, we compared patient beliefs to evidence-based recommendations for diabetes self-management. To our knowledge, this is the first study that compares concepts of diabetes self-management in Mexican Americans.
Americans and African Americans. This study focuses on patients from safety net institutions, which are institutions that deliver health services to uninsured, Medicaid and other vulnerable patients [31]. Because these patients tend to be higher risk and face more significant barriers to diabetes self-management than other populations [32], they may be in greater need of tailored diabetes self-management education.

**Methods**

**Participants**

As part of a larger study investigating the factors that facilitate and hinder diabetes self-management, we conducted 12 focus groups with a convenience sample of 84 African American and Mexican American diabetic participants recruited from community and hospital-based safety-net general medicine and diabetes clinics in Chicago, IL and San Francisco, CA. Five focus groups were conducted with African Americans (n = 35), four with Spanish-speaking Mexican Americans (n = 30) and three with English-speaking Mexican Americans (n = 19). Our goal was to conduct enough focus groups in each of the targeted study populations to reach theme-saturation.

To participate, patients had to self-identify as African American or Mexican American, be older than 18 years of age, have a diagnosis of type 2 diabetes confirmed in the medical record and speak either English or Spanish. We excluded patients who did not meet our inclusion criteria or who had cognitive impairment, active substance abuse or psychosis severe enough to interfere with participation in a focus group. The institutional review boards at each of the participating institutions approved the study.

**Procedure**

Each focus group lasted approximately 60 min. At the end of each focus group participants reported their age, years of education and type of health insurance and were given a $25 incentive. The focus group discussion guide included eight open-ended questions designed to promote discussion about two topics: participant experience of diabetes care and how they care for their diabetes. This article focuses on participant responses to the question: ‘What do you think is the best way to make your diabetes better?’ The moderator occasionally asked follow-up questions in order to clarify participants’ responses and to assure that all opinions were voiced. Focus groups were audio taped, transcribed verbatim and imported into ATLAS.ti (Scientific Software Development, Berlin, Germany), a qualitative data analysis software program.

**Data Analysis**

All transcripts were reviewed by at least two trained bilingual coders who, in collaboration with the study investigators, developed an overall coding scheme that captured the main themes that emerged across the focus group discussions. The coding scheme was developed using the inductive analytic process of grounded theory, meaning that codes were reflective of participant comments rather than a priori hypotheses of the researchers [30]. All transcripts were coded using the overall coding scheme. A $k$ statistic demonstrated an intercoder reliability of 0.96.

The current study focuses on the subset of codes within the overall coding scheme related to participant comments about effective diabetes self-management strategies. Using the comparative analysis approach from grounded theory [30], two authors independently refined the six broad ‘self-management’ codes by creating subcodes to reflect variation in meaning of participant comments. Subcodes were refined via iterative reading of transcripts and discussion until all coders agreed. Coders were blind to the ethnicity of the English-speaking focus group participants during the coding process. The first author, who is bilingual, coded all relevant portions of the Spanish and English transcripts. E.M., a bilingual co-author, coded all relevant Spanish transcript content and NL coded all relevant English transcript content. Disagreements regarding coding were infrequent and were resolved through discussion.
The salience of each self-management strategy was estimated by counting the number of focus groups in which it was discussed. If a particular strategy was mentioned in a greater number of focus groups, we assumed it was more salient to the population, and therefore more likely to guide behavior. Below, we present themes that emerged in at least 5 of the 12 focus groups and compare how frequently each theme was mentioned in African American and Mexican American focus groups.

Results

Table I shows demographic characteristics of participants. Relative to African Americans, Mexican American participants were less educated and less likely to have health insurance. The majority of the population either met financial eligibility for federal insurance or was unable to afford insurance. The six self-management strategies and subthemes, and the number of focus groups in which they were discussed, are shown in Table II.

Table I. Demographic characteristics of participants

<table>
<thead>
<tr>
<th></th>
<th>Mexican American</th>
<th>African American</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>49</td>
<td>35</td>
</tr>
<tr>
<td>Age, years (SD)</td>
<td>55.0 (10.8)</td>
<td>57.6 (10.7)</td>
</tr>
<tr>
<td>Female, %</td>
<td>43</td>
<td>48</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>35 (71%)</td>
<td>10 (29%)</td>
</tr>
<tr>
<td>High school only</td>
<td>4 (8%)</td>
<td>11 (31%)</td>
</tr>
<tr>
<td>More than high school</td>
<td>8 (16%)</td>
<td>14 (40%)</td>
</tr>
<tr>
<td>Language of focus group, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>19 (39%)</td>
<td>35 (100%)</td>
</tr>
<tr>
<td>Spanish</td>
<td>30 (61%)</td>
<td></td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>31 (63%)</td>
<td>8 (23%)</td>
</tr>
<tr>
<td>Private</td>
<td>3 (6%)</td>
<td>5 (14%)</td>
</tr>
<tr>
<td>Federal Insurance</td>
<td>11 (22%)</td>
<td>22 (63%)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (8%)</td>
<td></td>
</tr>
</tbody>
</table>
| *Education data was missing for two participants.*

Table II. Number of focus groups in which each diabetes self-management strategy was mentioned at least once

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Mexican American</th>
<th>African American</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of focus groups</td>
<td>7</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Medicines</td>
<td>7</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Refusing or questioning prescribed medications</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Barriers to access of medications</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Diet</td>
<td>7</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Eat more fruits, salad and/or vegetables</td>
<td>6</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Eat smaller portion sizes</td>
<td>6</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Drink less soda</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Eat less sugar</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Eat less meat</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Eat less fat (grasa)</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Eat balanced meals</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Eat less tortilla or bread</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Exercise more frequently</td>
<td>7</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Long intentional exercise</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Daily routine</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Reduce weight</td>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Alternative medicine</td>
<td>7</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Aloe vera/sabila</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Cactus/nopal</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Manage stress</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>
they’re telling me to do. I’m eating right, and I’m losing weight. And you’re going to give me the insulin? I don’t think so. This is my body. I’ve been the landlord 67 years (African American female).

So he gave me a 10 mg pill and for the last five years, that’s all I’ve been taking. I only take it once or twice a week. He got me down to taking one a day, but I don’t do that, because I don’t need it (African American male).

I don’t want to get addicted to the pills. So therefore, I myself pick out the ones that I think I should have (African American female).

Recently when I took that insulin, my legs [swelled] and my feet. And I know it was the insulin . . . So I don’t take it. I might take one in the morning time or in the evening if it’s really high . . . But other than that, I don’t take it (African American female).

Strategic modification of prescribed medication regimens was discussed in all African American groups, often at great length. In contrast, participants in only four Mexican American focus groups (three of which were Spanish-speaking focus groups) raised this topic, and it was not discussed extensively.

The other frequently discussed issue with regard to medications was ‘difficulty accessing medications’, often due to high cost, lack of insurance and difficulty navigating the healthcare system, as illustrated by these Mexican American women:

But even with medication the thing of it is is like down there where I live I don’t take my medicine the way I should because I don’t have enough medication. Like a 30-day bottle I’ll try to prolong it for a couple of months or three months (Mexican American female).

I’m lacking in my care for diabetes . . . it’s already the third week that I’ve come and they haven’t given me my medicine. I have tried to get it on the phone, but they never answer . . . a machine answers in English and I don’t understand anything. (Mexican American female)

I went to the doctor and because I don’t have insurance they didn’t pay attention to me. I went with high sugar and they told me . . . I can’t do anything for you. So I left there crying outside the clinic because I needed rapid attention and the medicines. (Mexican American female)

This topic was discussed in only one African American focus group but in a majority of Mexican American groups.

Diet

Participants in all focus groups mentioned that ‘diet’ was important for diabetes self-management, but usually did not mention specific dietary behaviors. The following is a typical exchange:

Moderator: Are there other ways to control your diabetes or make it better?

Participant: Diet and exercise and medication . . . (Mexican American male)

Occasionally, participants mentioned specific dietary behaviors; eight were mentioned with some frequency. Mexican American groups mentioned a greater number of specific dietary behaviors than African American groups. Eight specific dietary behaviors were mentioned by at least 50% of the Mexican American groups, but only two specific dietary behaviors were mentioned by at least 50% of African American groups (see Table II). ‘Eat more fruits, salads, and/or vegetables’ and ‘eat smaller portion sizes’ were two behaviors that were discussed with some frequency in both African American and Mexican American groups. Typical comments were:

Try to watch what I eat. I eat a lot of salads (Mexican American female).

I am 30 years old but I look like I’m 20 because I eat a lot of squash. (Mexican American female)
And I eat in small portions. That means that I’m never hungry (African American female). But my diet has not changed. I cannot eat breakfast. It will make me sick… lunch, that was only payday… You can only buy lunch on payday. But my dietary habits are still the same. I’m learning to eat food… little bird portions. (African American female)

The following five additional dietary behaviors were mentioned by participants in a majority of Mexican American groups: ‘drink less soda’, ‘eat less meat’, ‘eat less fat’, ‘eat balanced meals’ and ‘eat less tortilla and/or bread’. For example:

I don’t eat tortillas. Tortillas are very bad for the system of a diabetic. (Mexican American male)

I cannot drink regular soda. My sugar levels go to 400 if I drink one. (Mexican American male)

‘Eat less sugar’ was mentioned by a minority of both Mexican American and African American groups.

Exercise
Participants in all focus groups mentioned that exercise was important for diabetes control, but many were vague about the meaning of exercise, as this African American man illustrates:

They only tell me to fill up on my exercise and my insulin and my diet. And I keep up with that, and then I feel better (African American male).

More detailed participant comments revealed two different concepts of exercise. As the following quotations show, some participants defined exercise as a specific length of time dedicated solely to physical activity:

I have to exercise – I think, for me, exercise at least an hour every day (Mexican American male).

I go to the gym or to a park; but every day for half an hour or an hour I go for a walk, because if not, I’m going to be immobile from diabetes (Mexican American male).

I walk from 5:30 to 6:40, from 1 to 1:40, and from 6:00 to 6:40. After I eat I go for a walk… unless I’m doing housework… it’s not exercise or walking, but also I’m doing something (Mexican American female).

Other participants defined exercise as more mild activity, such as moving around while doing everyday activities, for example:

I do a lot of walking. I’m not going to say walk out of Chicago but I do a lot of walking, exercise, clean up around the house, keep myself active… I don’t walk far. I walk around the house (African American male).

I exercise every day. Uh… my therapist told me if I go up two flights of stairs everyday that’s enough exercise for me. And so every day I go down two flights of stairs and come back up. And I do that every single day (African American female).

Participants in five of the seven Mexican American focus groups mentioned dedicated time for physical activity, whereas only one participant in an African American group did. African Americans were more likely to define exercise as mild activity, engaged in as part of daily life activities, such as cleaning the house.

Reduce Weight
Participants in most focus groups reported that their doctor told them to lose weight to manage their diabetes. Weight loss was discussed with equal frequency in African American and Mexican American focus groups.

The doctor was very nice and she talked to me and… told me that I had to lose more weight. Because I thought I was losing weight (Mexican American female).

One doctor told me this… ‘If you lose 20 pounds, you’ll see a world of difference.’ (African American male).
Alternative Treatments
Participants were explicitly asked by the moderator whether they used treatments other than those prescribed by their doctors. Participants in every Mexican American group reported that either they, or friends and family, used alternative medicines for controlling diabetes. For example:

When I first became a diabetic I didn’t consult with a doctor, I took a treatment of nopal that a nutritionist gave me, and this immediately made me lose weight (Mexican American male).

Cactus (nopal) and aloe vera (sabila) were the most commonly mentioned alternative medicines. Each was mentioned by five of the seven Mexican American groups but none of the African American groups. Acupuncture, herbs and vitamins are examples of alternative treatments that were mentioned less frequently. Participants in only two of the African American focus groups reported using alternative medicines. Acupuncture and homeopathy were mentioned in one African American group and blackfoot was mentioned in another. None of those treatments was mentioned by any Mexican American.

Manage Stress
A number of participants, especially Mexican Americans, stated that stress could cause their blood sugar to go up or to go up and down and that reducing stress would help diabetes:

Because with that positive attitude I’m going to be better; somehow maybe less insulin, less medication... [As for] people that don’t have that positive attitude their life is very short. (Mexican American female)

...when the doctor found out that I had diabetes I had a lot of domestic violence in my home, my husband was an alcoholic... I had a very traumatic life... my doctor offered me psychological help and I am going to a therapist, maybe it was good for my diabetes for me to have a little more happiness. (Mexican American female)

Controlling stress as a means to help diabetes was raised in four Mexican American groups, but in only one African American group.

Discussion
The goal of the study was to explore low-income minority patients’ concepts of diabetes self-management and assess the extent to which patient beliefs correspond to evidence-based recommendations. Participants mentioned four of the seven key diabetes self-management behaviors identified by the AADE: medication use, exercise, diet or weight loss and managing the psycho-social dimension of diabetes (stress reduction). Three key self-care behaviors recommended by the AADE, self-monitoring of blood glucose, management of high and low blood glucose levels and prevention of diabetes complications, were rarely mentioned by participants.

Although many patients mentioned taking diabetes medications, diet and exercise as important self-management strategies, findings from this study suggest that participant understanding of those behaviors may differ substantially from the meaning intended by providers. Careful attention to participant comments suggests poor concordance between lay beliefs about diabetes self-management and medical recommendations. For most diabetes self-management strategies, participant beliefs do not actually correspond to provider recommendations.

Participants in every African American group, and about half the Mexican American groups, mentioned doubts about whether prescribed medications were necessary and explained that they intentionally did not take their medications as prescribed. A number of studies have shown that adherence to diabetes medications, as measured by prescription data, is lower in African Americans than whites [33–35]. African American patients with diabetes are more concerned than white or Hispanic patients about the harmfulness of diabetes medications [36],
which may explain their intentional non-adherence. One possible explanation for increased mistrust among African Americans is that they may be concerned about whether or not medicines are being used to ‘experiment’ on them [37, 38]. Evidence indicates that skepticism about diabetes medication is related to poorer glycemic control among African Americans [39].

Mexican Americans were more likely than African Americans to discuss barriers to acquisition of medications, including language, economic and system barriers. Other studies have found that Latinos were more likely to worry about the costs of medications than were African Americans or whites [36], and that lack of insurance, but not preferred language, is associated with inconsistent use of diabetes medications among older Mexican Americans [40]. To our knowledge there is no research comparing levels of adherence to diabetes medications and reasons for non-adherence among Mexican Americans and other ethnic groups [41].

The results of the current study suggest that causes of non-adherence may differ for African Americans and Mexican Americans. African Americans may be more likely to intentionally neglect taking medication, whereas Mexican Americans may be more likely to experience barriers to accessing medications.

Mexican American participants also frequently mentioned using alternative medicines, *sabila* (aloevera) and *nopal* (cactus), for managing diabetes. A number of studies have found that use of herbal treatments to treat diabetes is very prevalent among Mexican Americans, and aloe vera and cactus are commonly used herbal treatments [42–45]. However, these studies also find that use of herbal treatments is not preferred over biomedical treatments and biomedical treatments are often preferred. Lack of medical insurance has been associated with increased use of herbal treatments among Mexican Americans [43].

Participants in all groups mentioned ‘diet’ as a strategy for controlling diabetes, but mentioned few specific dietary behaviors. Surprisingly, only two specific dietary behaviors, eating more fruits and/or vegetables and eating smaller portions, were mentioned by a majority of the 12 groups. Monitoring of carbohydrates is a key nutritional recommendation for diabetes management [9], but was mentioned by only one participant. Mexican Americans mentioned a greater variety of specific dietary behaviors than did African Americans. Mexican American participants mentioned limiting particular carbohydrate-containing foods (e.g. tortillas or bread) and fat more often than African American participants. Similar to findings of Arcury et al. [17], a majority of participants in the current study discussed the importance of diet in general terms without mentioning specific behaviors. Knowing ‘that’ diet is related to diabetes control is different from knowing ‘how’ to control diabetes through diet [46]. Patients may require frequent communication from clinicians and others about how specific foods, e.g. bread, will affect blood sugar.

Definitions of exercise also varied substantially across participants. A number of participants, especially African Americans, described exercise as mild activity, such as walking around the house or up and down the stairs. Evidence suggests that moderate to vigorous levels of physical activity for at least 150 min per week are necessary to improve glycemic control [47]. Mexican Americans were more likely to describe exercise as moderate-level activity for a pre-specified amount of time. One possibility is that African American participants in the current study were more disabled than Mexican Americans and less able to engage in vigorous activity. However, studies have found that African American patients with diabetes are less likely to achieve recommended levels of physical activity than Mexican American or non-Hispanic white patients, independent of measured disability [48, 49]. As with diet, patients may understand that exercise is an important self-care behavior but not understand the specific level or kind of physical activity that will help control diabetes.

Finally, the fact that Mexican Americans were more likely than African Americans to mention controlling stress as a strategy for managing diabetes may be related to the prevalent belief among Mexican Americans that stress is an important
cause of diabetes [27, 28], as well as to the stressful reality that a majority of Mexican American participants in the current study lack health insurance.

It is important to note that participants did not mention self-monitoring of blood glucose, management of high and low blood glucose levels or prevention of diabetes complications when asked how they could make their diabetes better. It is impossible to know whether participants did not mention these self-management behaviors because of the way the question was asked or because they were not aware of them. Future research is necessary to determine whether diabetes patients understand the importance of managing blood glucose and preventing diabetes complications.

**Strengths and Limitations**

An important strength of this study is that it is the first to directly compare concepts of diabetes self-management among African Americans and Mexican Americans.

The use of open-ended questions in the focus group methodology has both benefits and limitations. Unlike more structured methods such as surveys, the open-ended questions used in the focus group allow participants to talk freely and express their own ideas. This allows for discovery on the part of the researchers. The limitation of using open-ended questions is that researchers cannot be sure that they have accessed the full range of beliefs held by participants. Moreover, in a focus group participant comments are likely to be influenced by the views and comments of other participants. However, because the current analysis focused on themes that independently emerged across distinct focus group discussions, we are confident that those themes reflect perspectives that are salient to participants. While results from the current study may not reflect the full range of knowledge and beliefs held by participants, they are likely to reflect some of the most salient viewpoints.

Another limitation of the study is that we were unable to measure the effect of a number of potentially important variables that might influence concepts of diabetes self-management, including gender, SES, prior diabetes self-management education and length of time with diabetes. We cannot estimate the effect of SES because our participants were from safety net hospitals, and therefore low-income. In a larger sample of the same population ($n = 711$), the median number of years with diabetes was 10 for African Americans and 8 for Mexican Americans and knowledge of diabetes self-management was low for both groups [50]. In order to better understand determinants of diabetes self-management knowledge, future research should explore the hypotheses generated in this study with a larger, more diverse population.

**Implications**

Our study suggests that Mexican American and African American patients with diabetes think about diabetes self-management primarily in terms of medication use, diet and exercise. While they successfully identified medication, diet and exercise as effective self-management behaviors, further examination revealed that participant definitions of those terms often differed substantially from evidence-based recommendations.

Examining patient comments in more detail also revealed potential differences between African Americans and Mexican Americans in self-management concepts, suggesting that interventions for African Americans and Mexican Americans might need to emphasize slightly different aspects of self-management. Interventions for African Americans may need to emphasize specific dietary behaviors for effective diabetes control, explicit definitions of required physical activity levels and reduction of skepticism about medications in order to increase adherence. Interventions for Mexican Americans may need to emphasize specific dietary behaviors for effective diabetes control, how to overcome barriers to medication access and address use of herbal remedies for diabetes control.

Blood glucose self-monitoring, adjustment of behavior for high or low glucose levels and preventing diabetes complications (e.g. foot or eye exams), were rarely mentioned and thus do not appear to have been salient to focus group participants in the
current study. Interventions may be necessary to increase awareness of these diabetes self-management strategies among African American and Mexican American patients.

In sum, results of this study suggest that ideas of low-income minority patients about how to best manage their diabetes differ from evidence-based guidelines and furthermore, that these ideas differ across racial or ethnic groups. These findings can serve as a guide for development of tailored diabetes self-management interventions for Mexican American and African American patient populations.

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Conflict of interest statement

None declared.

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