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Illustrated Medication Instructions as a Strategy to Improve Medication Management Among Latinos: A Qualitative Analysis

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Abstract

Although illustrated medication instructions may improve medication management among vulnerable populations, little prior research has evaluated their use among Latinos. We conducted focus groups and interviews with Latino patients with diabetes at two safety net clinics in Tennessee to understand medication taking practices and perceptions of illustrated medication instructions. Patients reported confidence in being able to take medications, but demonstrated a lack of understanding of medication instructions. On further probing, they described several barriers to effective medication management rooted in poor communication. Patients expressed preference for illustrated medication instructions which could address several of the challenges raised by patients.

Keywords

Adherence; communication; culture; health education; medication; patient satisfaction; qualitative methods

Health disparities, particularly in chronic disease, are highly prevalent among Latinos, the fastest growing segment of the United States population (Agency for Healthcare Research and Quality, 2007). Latinos are almost twice as likely as non-Latino whites to develop diabetes. They have a higher prevalence of chronic obstructive pulmonary disease (COPD), hypertension, obesity, chronic liver disease, tuberculosis, and HIV/AIDS (Agency for Healthcare Research and Quality, 2007). According to the 2007 National Healthcare Disparities Report, Latinos received lower quality of care than their reference groups for 77% of core quality measures (Agency for Healthcare Research and Quality, 2007).

Suboptimal management of medications for chronic illnesses plays a role in perpetuating many of these disparities (Institute of Medicine, 2003). Several studies demonstrate that

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Competing interests:

Drs. Mohan, Boyington, and Kripalani are consultants to and hold equity in PictureRx, LLC. Mr. Riley is a full-time employee of PictureRx, LLC.

racial and ethnic minority groups, including Latinos, have significantly lower adherence to prescribed medications (Gellad et al., 2007; Kaplan et al., 2004). Although the reasons for non-adherence are myriad, health literacy plays an important role, especially among Latinos (Davis et al., 2009; Heisler et al., 2007). According to the National Assessment of Adult Literacy (NAAL), Latinos had lower average health literacy scores than any other racial or ethnic group tested. Fully 41% of Latinos scored at the below basic level compared to 12% in the total NAAL population (Kutner et al., 2005). Exacerbating the challenges posed by low health literacy, many Latinos also face language-related difficulties as they attempt to navigate the U.S. health care system where information is largely provided in English (Weiss et al., 2007).

Research has shown that patient-centered medication lists and illustrated medication instructions can improve patients' knowledge, satisfaction and adherence (American Society of Health System Pharmacists, 2008). These tools may be particularly valuable for patients who have low health literacy or limited English proficiency, because they are at greater risk for poor communication in clinical encounters (Mutchler et al., 2007; Katz et al., 2007; National Quality Forum, 2005). A patient-centered medication list is a "tool used and owned by the patient to maintain a list of his or her current prescription and nonprescription medications and dietary supplements" (American Society of Health System Pharmacists, 2008). Such lists can serve as an important vehicle for communicating the medication history across the continuum of care, thereby reducing medication errors (Cua and Kripalani, 2008). The widespread adoption of patient-centered medication lists has been championed by the American Society of Health System Pharmacists and supported by the National Quality Forum (American Society of Health System Pharmacists, 2008; National Quality Forum, 2005).

Although illustrated medication instructions have been less widely promoted than other medication lists, there is a growing body of evidence which supports their efficacy. The potential benefit of illustration medications is based on a cognitive preference for picture-based, rather than text-based, information, the so-called "picture superiority effect" (Maisto and Queen, 1992). In a systematic review of 15 published studies which tested illustrated medication instructions, statistically significant improvements were noted in patients' comprehension (8 of 11 studies), recall of the medication regimen (4 of 6 studies), patient satisfaction (3 of 7 studies), and adherence (2 of 2 studies), compared to text-only instructions (Katz et al., 2006). Although these studies have been performed in diverse populations including internationally, little research exists on the utility of such aids among Latinos and whether they would be well-accepted among that population. In addition, other research demonstrates the importance of pilot testing illustrated medication instructions in the target population because of cultural differences (Dowse and Ehlers, 2004).

PictureRx™ is a software platform that generates illustrated, patient-centered medication lists. PictureRx cards convey, in a daily medication schedule, the following essential information that patients should understand about each medication in their regimen: the name, dose, frequency, purpose, and special instructions (Figure 1). The cards intentionally do not provide the full range of information commonly found on package inserts, because research has proven that these are poorly designed and understood (Shrank and Avorn, 2007). The design of PictureRx cards is evidence-based, drawing on research and best practices for the creation of patient education materials, as well as the use of illustrations to convey medication instructions and other health-related information (Office of Communication, 1999; Doak et al., 1998; Kripalani, 1995; Ardit; Houts et al., 2006; Katz et al., 2006). PictureRx medication instructions use plain language and numerals, and they refer to specific times of day (e.g., "Take 1 pill in the morning" rather than "Take one tablet daily"), consistent with recommendations presented at the Institute of Medicine (Institute of

Medicine, 2008). Recent research suggests that this strategy leads to better patient comprehension (Wolf et al., 2011c; Wolf et al., 2011a).

PictureRx was previously evaluated among low-income, primarily African-American, patients (Gazmararian et al., 2010; de Cruppe et al., 2002), but has not been evaluated among Latinos. Our aims in this study were thus to conduct a qualitative evaluation to: 1) better understand medication taking practices among low-income Latinos; and 2) evaluate Latino patients' perceptions regarding PictureRx, specifically assessing whether PictureRx could address patients' challenges with medication taking and be a culturally appropriate tool to improve communication about medication information. This evaluation was performed in part to adapt PictureRx to the needs of the Latino community, as well as to inform a planned clinical trial to test the effect of PictureRx on patient satisfaction and self-reported medication adherence among Latinos.

Methods

Study sample

The study was approved by the New England Institutional Review Board. From June 2010 to December 2010 we enrolled a convenience sample of Latino patients in Nashville, TN, from 2 safety net clinics, where providers deliver healthcare services to underserved and uninsured populations regardless of patients' ability to pay. Patients were referred to the study by clinic staff or were approached in the waiting room by research staff and invited to participate. Patients were eligible if they spoke Spanish, were at least 18 years of age, and had been diagnosed with diabetes. We selected patients with diabetes in order to focus on a prevalent condition with known ethnic disparities, for which medication use is an important part of self-management (Agency for Healthcare Research and Quality, 2007). Patients were excluded if they had poor hearing, corrected visual acuity > 20/50 using a pocket eye chart (Rosenbaum Pocket Screener), or had been diagnosed with dementia based on chart review.

Initial screening identified 94 patients who were potentially willing to return for a focus group or complete an interview. Of these, 38 participated in 6 focus groups and 7 interviews. The most common reasons for non-participation were lack of time or transportation difficulties.

Data collection

After confirmation of eligibility, informed consent and HIPAA authorization were obtained in Spanish from interested patients. Baseline data were collected in Spanish at that time, including demographic items, self-assessments of English ability and computer use, and a 3-item health literacy screening test, which has been validated among Spanish-speaking patients (Sarkar et al., 2011). The items are: 1) "How confident are you filling out medical forms by yourself?", 2) "How often do you have someone help you read hospital materials?", and 3) "How often do you have problems learning about your medical condition because of difficulty understanding written information?"

Consenting patients were scheduled to return for a focus group session. If they stated they could not return for a focus group, they were invited to participate in a one-on-one interview at the time of enrollment. Interviews and focus groups were identical in terms of the content they sought to assess.

A Spanish-speaking moderator with qualitative research experience led each focus group or interview and was assisted with note taking by a native Spanish-speaking research assistant. The format was semi-structured and aided by a moderator's guide that contained open-ended questions regarding various aspects of patients' medication management, including their

beliefs, practices, and challenges. Examples of questions in each area included the following:

Beliefs

- What role do your medicines play in keeping you healthy?
- Do you believe it is important to take your medicines as instructed?

Practices

- How do you keep track of and remember your medications?
- What are some of the things you or your family have tried to do to make it easier for you to take your medicines?

Challenges

- It is common for people to make mistakes with medicines. Have you ever made a mistake like taking the wrong medicine or dose? What happened?
- What makes it difficult to take your medications as directed?

Participants were also shown the PictureRx tool and asked to provide their impressions of it, as well as gauge its suitability for Latinos.

Focus groups and interviews lasted 90-120 minutes and were audio recorded. Participants received \$40 as compensation.

Data analysis

The interviews and focus groups were transcribed. Unabridged transcripts along with field notes and interview summaries served as the basis for the qualitative analyses. Two evaluators (A.V.M., B.R.) independently reviewed each transcript and categorized participant responses using a coding framework that mirrored the content and structure of the moderator's guide. Emergent themes were also identified and added to the existing coding structure. Coding was checked for consistency. Dominant themes and divergent opinions were noted, discussed, and summarized by topic area during regular research meetings where all investigators were present. Finally, relevant patient quotations were extracted to help illustrate common themes and translated into English below.

Descriptive statistics were used to analyze demographic information, which included gender, level of education completed, and health literacy level. Characteristics of patients who participated in interviews or focus groups, and those who were consented but did not return for focus groups, were compared with student's t-test using SAS 9.2 (SAS Institute, Cary, NC).

Results

Patient characteristics

Patient characteristics are presented in Table 1. The mean age of participants was 49 years. They had 8 years of education and had been living in the U.S. for 14 years. A clear majority (76%) had an income less than \$20,000. Most patients were from Mexico (76%). Patients generally spoke no or very limited English (76%). The mean duration of diabetes was 7 years and patients took an average of 3.5 medications.

Based on the health literacy screening questions, 56% of patients had difficulty filling out forms, 58% had difficulty reading medical materials, and 81% had difficulty learning about

their medical condition due to difficulty understanding written health information. Most patients had little or no computer experience (76%) and no access to the computers or the internet (63%).

Experiences with medication taking

Patients often expressed a high degree of confidence in being able to take their medications correctly. However, when asked about their medication regimen, a majority of patients did not know the name, dosage, or purpose of their medications. They described numerous instances of medication errors and adverse events, including hyperglycemic and hypoglycemic episodes and Emergency Department visits. When probed about the inciting factor for these events, many, but not all, were rooted in miscommunication about medications. For example, several patients described filling a prescription and receiving a new dose, but not realizing the instructions had changed. They dosed the medication incorrectly before the misunderstanding was finally discovered. Other patients noted misreading information on the prescription drug label. The patients also noted difficulty adhering to the prescribed regimen. These issues were particularly common among patients with limited health literacy.

Current medication management practices

Though most patients were unfamiliar with the actual names of their medications, they were able to recognize them on verbal prompting. This was especially true for common medications such as the type of insulin, metformin and aspirin. Patients who took more than 2 or 3 medications often referred to their medicines by pill color, shape, or indication. Patients who felt most capable of adhering to medication instructions mentioned their reliance on established routines (e.g., taking medicines at the same time, going to work at the same time every day). Breaks from the routine (e.g., being rushed, skipping meals, etc.) were cited as the primary cause of improper medication use or non-adherence. Patients generally did not report using pill boxes or other organizers which they attributed to the small number of medications they took.

Some patients discussed how they supplemented the original medication instructions to make them easier to follow. This was sometimes done to help reconcile verbal instructions with those on the medication container label. One focus group member said:

What you have to do is mark it. Grab yourself a marker, put "M" for the morning. All [the vials] that have "M" you take in the morning, all that you have to take in the afternoon, you put "T" [afternoon=tarde]... You'll do better with this system.

One participant, who also works as a home health aide, described how she prepares a weekly plan for herself that includes her dosing schedule as well as her medical appointments. Even with an established routine, she remarked that it was still difficult.

[Maintaining a medication regimen] ... is even complicated for someone who has experience. What I do is that I prepare a weekly plan, and put in it a place where I will see it every morning, otherwise I will forget. I have a hurried life. I get up to do things around the house. If I have to go shopping, if I have a doctor's appointment, all the same I have not taken my medications because I left the house early.

Challenges to proper medication taking

Patients noted 4 major contributors to improper medication taking. First, patients noted that many health providers did not fully explain how a treatment worked or how to properly take medications; patients attributed this to language barriers or time constraints. As a result

patients were unaware of common side effects and seemed to be unaware of the consequences of taking medications incorrectly. Second, patients described the written information on prescription drug labels to be confusing or incomplete. For example, one patient described the information as “fine print . . . [that] will never be read.” Third, patients noted that the hectic nature of their lives made it difficult to adhere to a schedule. This was often related to their jobs, which could be unpredictable or seasonal in nature. Lastly, there was a lack of congruence between the cultural models of patients and providers which was exacerbated by patients’ distrust of the health care system. Many patients reported not believing in or following common principles of chronic disease management, such as regular use of prescribed medications. Several participants noted that they took their medicines only when their body “told them,” while others believed that their diet was of greater importance to their health than adherence to medications. A few patients felt troubled by their providers’ practice of regularly assessing treatment status and adjusting medications. These patients mentioned that they often felt like “guinea pigs,” their doctors did not know what they were doing, or that they knew better than their doctor what treatment was most effective for them. As one patient said:

The other day I said to the doctor, “Why do you use us like [guinea pigs] when the disease has been studied for so many years?” I told her. And there are scientists that have studied [this disease] for many years, and they are dedicated to this. And she is a doctor. “Are you a degreed doctor? Or what?” I said....She decided to give me other pills. It was better that I threw them into the garbage and continued using the others [that he had been using].

Importantly, patients did not describe the cost of medications as a major barrier to proper medication management; patients attributed this to the availability of generic medications, which are lower-cost than brand-name medications. However, many patients described difficulty affording ancillary supplies such as glucometers and test strips.

Many of the challenges that patients described were rooted in a lack of Spanish or healthcare services. Patients commonly received health care services or prescription medications in facilities without Spanish speakers or sufficient interpreter services. These patients often noted bringing family members to aid in communicating. Patients also reported asking other Latino patients for their help in translating information, for example, while waiting in line at the pharmacy. The absence of reliable interpreter services was often seen as problematic, as demonstrated by these focus group comments:

[Person1]: The problem is that, for example....for someone who does not speak adequate English who goes to a doctor, how can you explain yourself to the physician?

[Person2]: I don't say anything. [Group laughter]. Really, I don't speak at all....I speak with [clinic's Spanish-speaking medical assistant....] But she is very friendly.

In addition to the lack of sufficient interpreter services, a high proportion of participants described unsatisfactory medical encounters with health care providers. Patients readily identified instances in which they felt rushed or that their provider was impatient, leading to reluctance to ask questions. As one participant noted:

If I ask a question, I get “No...no...Everything is fine. You take this and do this and everything will be fine” . . . I am looking at this and saying thank God I am a fairly healthy person!

As a result, patients frequently reported having to rely on information about their medications from friends and family. When patients did need to turn to written medication information, such as prescription drug labels and information sheets from the pharmacy,

these were largely provided in English. Consequently they were widely seen as difficult to understand and could even precipitate errors.

Perception of PictureRx

When shown an example of a PictureRx illustrated medication schedule (Figure 1), patients expressed a positive response. Patients said they would find such instructions would definitely be helpful and liked its use of colors, pill images and simplified dosing. The consensus sentiment about the card was that it would make it easier for patients to use their medicines correctly and would give them greater confidence in taking their medications. Participants believed the card could reduce the chances of a medication error, especially for patients with vision problems or who had difficulty reading. Several participants also noted that the tool might also be useful to caregivers:

One thing you could guess is that one could be sick, that there is someone who is in the home to take care of you and that they do not know the [patient's] instructions. This person could go look at this [PictureRx card]. At times, it is not the person who is taking the medicine but another person who gives it to them. It would be easy for this other person to see these instructions and [manage them] for the patient.

Describing traditional medication instructions as “fine print” that “will never be read,” participants routinely expressed perceiving value in the simplicity of illustrated medication instructions:

I think the idea of colors with graphics...the large print, it calls attention to it [medication information].

Patients were especially pleased with the use of times of day (Morning, Noon, Evening, Night), which they felt was easy to understand and echoed some of their own medication taking strategies (e.g., marking each bottle with an “M” or “T”).

When asked how the PictureRx cards could be improved further, a majority of patients expressed a preference for larger font sizes, adding colors to the icons that show each medication's purpose, and including common instructions such as “take with food” or common side effect warnings. Participants also noted that initial PictureRx prototype shown did not indicate specific hours for the time of the day, and that not having time anchors could be confusing to some card users.

Discussion

In this qualitative study, Latinos articulated numerous barriers to effective chronic disease control and medication taking including confusion about medication instructions that contributed to unintentional non-adherence, intentional non-adherence to prescribed medications that was related in part to mistrust, and general dissatisfaction with the current state of patient-provider communication about medications. These barriers appear to stem from communication barriers and cultural incongruence, among other factors. These findings are of importance to providers, who should take further steps to improve care for Latinos.

Illustrated medication instructions could address several of the challenges the participants in our study noted. They desired additional information, particularly about their medications, provided in a way they could understand. This included more specific details about when medications ought to be taken and how they should be taken.

Illustrated medication instructions are more easily understood by adults with limited health literacy or limited English proficiency (Kripalani et al., 2007a; Katz et al., 2006). Studies conducted in the US and internationally have demonstrated the value of pictorial instructions in improving patient comprehension of medication instructions, adherence, and satisfaction (Katz et al., 2006). These pictorial instructions may further benefit from the use of the Universal Medication Schedule (UMS), an approach followed by the PictureRx card to facilitate comprehension and which patients liked. The UMS specifies 4 standard daily dosing times – morning, noon, evening, and bedtime. Approximately 90% of medications are taken 4 or fewer times a day (Wolf et al., 2011b). The UMS was described in a report to the Institute of Medicine as a sensible strategy to simplify medication instructions and improve patient understanding (Wolf et al., 2011b). Patients also suggested several areas of improvement, which we used to revise the PictureRx cards. These included adding time of day anchors, adding language about whether a medication should or shouldn't be taken with food, and using larger fonts. We are conducting additional research on the icons used to convey drug indication.

In using illustrated medication instructions, providers should not rely on patients to initiate a request for assistance. Patients, particularly those with low health literacy or limited English proficiency, are not likely to raise concerns about lack of understanding medication information. This creates a need to systematically identify “at-risk” patients and provide additional education. In addition, providers should more routinely ask patients to “teach-back” key information in order to ensure understanding. The use of teach-back may improve recall and understanding of medication information and is considered a top patient safety practice (Kripalani and Weiss, 2006).

Our study also highlights that even with illustrated medication instructions many challenges remain to improve adherence among Latinos. First, several of the communication barriers participants described were rooted in language discordance which may be better addressed through greater availability of interpreter services. Second, previous work by Rob Horne has shown that beliefs relating to patients’ medication taking can be grouped under 2 categories: perceptions of necessity or concerns about potential adverse effects ((Horne et al., 2007; Horne et al., 2004). Consistent with this, many patients in our sample expressed mistrust of health care providers and their perceptions of the necessity for diabetes medications (including titration of those medications) were not consistent with the clinical picture. Thus, in providing counseling about medications, it is critical that providers elicit health beliefs about chronic medication use, set shared goals that respect patients’ values, and demonstrate cultural competence in other ways (Kripalani et al., 2006).

Limitations of this study include that it was qualitative in nature, and therefore, it is not possible to draw firm conclusions. It was conducted among a convenience sample of Latino patients with diabetes at 2 safety net clinics in Nashville, TN. Most of the patients were immigrants from Mexico and had a low household income. The views expressed in focus groups and interviews do not necessarily represent those of the broader Latino community. Nevertheless, the findings of this study are congruent with other reports, which lend support to our observations (Dilworth et al., 2009; Morales et al., 1999; Ortega et al., 2007).

In conclusion, although low-income Latino patients expressed a high-degree of confidence in being able to take medications as prescribed, on further probing, they expressed a lack of understanding of medication instructions. They also described numerous barriers related to language and communication with health care providers and lack of cultural congruence between patients and providers. Patients indicated that illustrated medication instructions could help address some of these barriers, as they were felt to be easier to understand and preferable to traditional medication information including medication labels and leaflets.

Our research highlights the importance of providers eliciting and addressing patient understanding, beliefs, and practices when prescribing medications to Spanish-speaking Latinos. Further research is needed to directly assess the utility of illustrated medication instructions among Latinos.

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pictureRx			ALLERGIES	YOUR DOCTOR	YOUR PHARMACY	
Name: Caroline Tisdale			Penicillin, Sulfa, Eggs	William Clark 615-345-1912 John Snow 615-528-4831	Abr's Pharmacy 615-565-1212	
Pill Name	Used For?	Instructions	MORNING 7-9am	NOON 11-1pm	EVENING 4-6pm	BEDTIME 9-11pm
 Aspirin 81 mg	 Heart	Take 1 pill in the morning. Take with food.	 1 pill			
 Ranitidine HCl 150 mg	 Heartburn or Ulcers	Take 1 pill in the morning, and 1 pill in the evening.	 1 pill		 1 pill	
 Novolog Mx 70-30 100 units/mL (70-30)	 Diabetes	Inject 24 units under the skin in the morning as directed, and 12 units under the skin in the evening as directed.	 24 units		 12 units	
 Lisinopril 10 mg	 Blood Pressure	Take 1 pill in the morning.	 1 pill			
 Simvastatin 20 mg	 Cholesterol	Take 1 pill at bedtime.				 1 pill
 Albuterol Sulfate 90 MDIACTUATION	 Breathing	Take 2 puffs every 6 hours as needed for breathing.				

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Figure 1.
PictureRx illustrated medication instructions

Table 1

Participant characteristics

Number	38
Age, mean (\pm SD)	49.1 years (9.9)
Female gender, N (%)	24 (63%)
Country of origin	
Mexico	76%
All other	24%
Time in the US, mean (\pm SD)	13.7 years (8.2)
Range	1 month-31 years
Self-rated English proficiency,	
None or limited	29 (76%)
Conversational	9 (24%)
Advanced or Native	0 (0%)
Insurance	
None	31 (82%)
Private	2 (5%)
Medicaid	2 (5%)
Medicare	3 (8%)
Household income	
< \$10k	10 (27%)
\$10k-<20K	19 (51%)
\$20-<40K	7 (19%)
\$>40K	1 (3%)
Prescription medications, mean (\pm SD)	3.5 (1.8)
How confident participant is in filling out medical forms	
Extremely	5 (14%)
Quite a bit	9 (26%)
Somewhat	5 (14%)
A little bit	9 (26%)
Not at all	7 (20%)
How often participant needs help reading hospital materials	
Always	13 (36%)
Often	3 (8%)
Sometimes	11 (31%)
Occasionally	3 (8%)
Never	6 (17%)
How often participant has problems learning about medical condition due to difficulty understanding written medical information	
Always	7 (19%)
Often	6 (17%)
Sometimes	16 (44%)
Occasionally	4 (11%)

Number	38
Never	3 (8%)
