



Educating and Empowering Elders: Improving the Health of Senior Latino Diabetics through
Community Collaboration

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Abstract

According to the American Diabetes Association (ADA), diabetes is the sixth leading cause of death among Americans.¹ As of 2005, estimates indicate 20.8 million people – 7 percent of the population – afflicted by diabetes, 6.2 million of which are undiagnosed. ¹ While diabetes is a growing problem for the United States as a whole, older, poverty-stricken Latinos and other minority groups have felt the encumbrance of this trend most intensely.² In Massachusetts, the burden of diabetes among Caribbean Latinos is 11.8 percent, which is 2.5 times greater than the prevalence for the majority of the population in the state (4.7 percent).³ The age-adjusted rate for Latinos with diabetes is 36.25 per 100,000—76 percent higher than the state rate of 20.56.⁴ If this trend continues, the prevalence of type 2 diabetes nationwide will skyrocket, as Hispanics constitute the largest and fastest-growing minority in the United States.⁵

Keywords

Diabetes – Statistics; Hispanic Americans; Latinos; REACH 2010

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Abstract

According to the American Diabetes Association (ADA), diabetes is the sixth leading cause of death among Americans.¹ As of 2005, estimates indicate 20.8 million people – 7 percent of the population – afflicted by diabetes, 6.2 million of which are undiagnosed. ¹ While diabetes is a growing problem for the United States as a whole, older, poverty-stricken Latinos and other minority groups have felt the encumbrance of this trend most intensely.² In Massachusetts, the burden of diabetes among Caribbean Latinos is 11.8 percent, which is 2.5 times greater than the prevalence for the majority of the population in the state (4.7 percent).³ The age-adjusted rate for Latinos with diabetes is 36.25 per 100,000—76 percent higher than the state rate of 20.56.⁴ If this trend continues, the prevalence of type 2 diabetes nationwide will skyrocket, as Hispanics constitute the largest and fastest-growing minority in the United States.⁵

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Introduction

According to the American Diabetes Association (ADA), diabetes is the sixth leading cause of death among Americans.¹ As of 2005, estimates indicate 20.8 million people – 7 percent of the population – afflicted by diabetes, 6.2 million of which are undiagnosed. While diabetes is a growing problem for the United States as a whole, older, poverty-stricken Latinos and other minority groups have felt the encumbrance of this trend most intensely.² In Massachusetts, the burden of diabetes among Caribbean Latinos is 11.8 percent, which is 2.5 times greater than the prevalence for the majority of the population in the state (4.7 percent).³ The age-adjusted rate for Latinos with diabetes is 36.25 per 100,000—76 percent higher than the state rate of 20.56.⁴ If this trend continues, the prevalence of type 2 diabetes nationwide will skyrocket, as Hispanics constitute the largest and fastest-growing minority in the United States.⁵

To address this disparity, a collaborative was formed that included professionals from Home Health VNA, Merrimack Valley Nutrition Program, and the Lawrence Council on Aging. This Diabetes Today Coalition team worked closely with the Greater Lawrence Family Health Center to secure funding from the Center for Disease Control and Prevention (CDC). Working under the auspices of the CDC's Racial and Ethnic Approaches to Community Health (REACH 2010) grant initiative, the project began in October 1999.

The purpose of the resulting study was to evaluate a collaborative community intervention to create greater empowerment of elder Latino diabetics as measured by improved health status indicators. The coalition designed a 10-week educational program, in Spanish, for elder Latinos with Diabetes that would promote self-management and lifestyle changes necessary for positive health outcomes. This study took place in Lawrence, MA which has the largest proportion (60 percent) of Latinos of any Massachusetts community and has 24.3 percent of the population living below the poverty line.⁶

Self-management of diabetes mellitus by the patient is critical to ensuring positive health outcomes, and daily lifestyle changes are necessary to achieve that management. Gleeson-Kreig (2002) reinforced the need for self-efficacy and education for the diabetic patient, as well as the need to focus attention on developing community support alternatives for diabetics without a familial support system.⁷ Determinants of successful diabetes mellitus management are lifestyle changes such as diet and exercise, and limitations to wellness lie with the patient. Social support and self-care education are therefore critical to successful care of this potentially debilitating disease. The intervention designed by the Latino Health 2010 collaborative consisted of education designed to improve knowledge about diabetes, improve dietary habits, and increase physical activity in a familiar, non-clinical environment.

The disparity between Latinos and the majority population is the result of many factors and this study focused on three—diet, exercise, and lack of knowledge about the disease. The traditional Latino diet is high in saturated fat, which, combined with low levels of physical activity, leads to higher rates of obesity-related diseases such as type 2 diabetes.⁸ Vazquez et al. specifically looked at Caribbean Latinos in Massachusetts with type 2 diabetes.⁹ Their study showed that participants consumed a diet high in saturated fat and sugar, and that culturally sensitive interventions could produce significant decreases in the intake of both. Another study found that Caribbean Latinos commonly had a second meal after dinner.³

Another factor contributing to diabetes is lack of exercise. Changing exercise behavior is difficult at best. One-on-one approaches have produced only modest change.¹⁰ However, the issue of peer support contributes to successful change.¹¹ A study of urban Caribbean Latinos with type 2 diabetes in Massachusetts found that focus group participants had little understanding of the impact exercise could have on their prognosis.³ Barriers to exercise included physical effects such as leg pain or foot swelling, as well as location, access, safety and supervision. Additionally, Hispanic women are most likely to report no leisure time physical activity.³ Latino residents of Lawrence categorize themselves as physically active (34.4 percent), somewhat active (36 percent), and physically inactive (29.6 percent), which is up to 30 percent lower than among most Americans.¹²

Knowledge about the disease of diabetes is limited in immigrant, Spanish-speaking communities. The need for culturally sensitive and linguistically appropriate diabetes education and social support programs has been well documented.¹³ McElmurry (2003) developed a system using community health advocates (CHA) to provide such a service in Latino communities.¹⁴ To address low literacy needs, studies have conducted support groups focusing on peer support and culturally familiar vehicles, such as the daytime drama (soap opera).¹⁵ Studies suggest that diabetic patients are best served by health care professionals working via a “team approach” – serving as patient educators while incorporating peer support, behavioral contracting, and physician guidance.¹⁶ The success of a diabetes care model incorporating nurse case management, group education, peer educators, and guidance by a dietician has been documented; with patients experiencing improvements in HbA1C values, reduced cholesterol, and lowered blood pressure.¹⁷

Methods

The study design was community-based participatory research (CBPR). Pitfalls and strengths of using this approach for intervention research have

been well articulated.¹⁸ The approach of this study conforms to the principles delineated by primary care professionals.¹⁹ Detailed planning and pilot workshops were conducted during the subsequent 18 months. Approval for the project was provided through the IRB committee of the University of Massachusetts, Latino Health 2010's collaborating university.

The planning began during the fall of 1999. Three potential collaborators responded to a call disseminated to over 100 community organizations for "mini-grant" proposals to test ideas for community-based interventions regarding diabetes. This Senior Center proposal was one of 30 projects submitted for consideration. The collaborators had worked together for the previous three years in the Lawrence Diabetes Today Coalition sponsored by the Massachusetts Department of Public Health. The strategy of the REACH 2010 project staff was to mobilize community partners who already had a history of collaboration to effect change for community members with diabetes. The strategy was adopted through the advice and leadership of the project's administrative director who was selected because of her longstanding experience and leadership as a Latino woman who lived in the community. The three potential collaborators had already concluded among themselves that an educational program was needed for diabetics at the Senior Center. Their mini-grant proposal outlined ideas for nutrition, physical activity, and diabetes education. Upon its acceptance, the small group worked for approximately three months preparing lesson plans, a recruitment plan to enlist 10 seniors for a pilot program, and how to use the services of the Senior Center, the Home Health VNA, and the Merrimack Valley Nutrition project to deliver the education. The collaborators tested and revised each lesson plan for the 10-week program. The existing Senior Center outreach process was used for recruiting. The meals on wheels program was modified to include preparing traditional Hispanic food in a healthier manner. The VNA nurses measured HbA1c, BMI, lipids, and blood pressure before and after the program and administered a brief knowledge questionnaire. In 10 weeks the pilot group dropped a half point (HbA1c) and expressed high satisfaction with the program. The preliminary results suggested success so it was selected to be expanded as a community intervention.

This study involved 26 groups of Hispanic participants in the 10-week educational program conducted from June, 2001 through August, 2006. The participants self-identified their origin as Dominican, Puerto Rican, or Hispanic (See Table 1 below). Many who were identified as Hispanic had partial Dominican or Puerto Rican heritage. There were 267 participants who agreed to participate and signed consent forms; of these 40 did not attend the sessions after having consented to do so. Another five attended some sessions, but did not have both pre and post data for comparison. The individuals who

did not return for any sessions continued to attend the senior center activities, but were content to have benefited from the initial measurements taken and free lunch the first session. Because of the community-based nature of the project, the desire of these individuals to drop out after one session was respected without further investigation by project staff. With more groups to be formed these individuals were repeatedly invited to participate in the entire project. The remainder, 222, actively completed the 10-week program. Additional participants will continue to be recruited through September 2007 because of the success to date. The ages of the 222 study participants ranged from 51 to 86, (Mean = 66, StDev = 7.8). The participants were predominantly women (n=153, 68.9 percent). Demographic data for the participants and subgroups are summarized in Table 1.

Table 1. Demographic Comparison of Study Group and Subgroups

		Consented then Dropped	Dropped Due to Incomplete Data	Participants Completing Workshops
Number	-----	40	5	222
Age	Range	53-85	55-73	51-86
	Average	67.1	60.6	66.3
	St Dev	7.6	7.2	7.8
Sex	Female	25 (62.5%)	5 (100%)	153 (68.9%)
	Male	15 (37.5%)	0	69 (31.3%)
Origin	Dominican	22 (55%)	4 (80%)	109 (49.1%)
	Puerto Rican	9 (22.5%)	0	48 (21.6%)
	Other Hispanic	9 (22.5%)	1 (20%)	65 (29.3%)

To recruit participants a brochure describing the program was developed in English and Spanish. A project coordinator led recruitment efforts through outreach to churches, social groups, and community events attended by Latino residents of Lawrence. In addition, a nurse from Home Health VNA contacted physician offices and nursing organizations in Lawrence to increase awareness of the program and seek referrals of potential participants. The coordinator and nurse interviewed potential participants, completed intake forms and maintained contact with participants throughout the program and afterwards. Over 90 percent of the participants were identified through the direct efforts of the project coordinator who was made an employee of the Senior Center. Recruitment became easier as the project continued because of growing "word of mouth" promotion by Senior Center regular attendees who speak highly of the project.

A member of the REACH 2010 Latino Health project staff conducted the informed consent process with each participant, consistent with the protocol approved by the IRB at the University of Massachusetts Medical School. Each week of the 10-week program involved three one-hour sessions addressing the three main determinants of successful diabetes management: diabetes education, nutrition modeling and walking and exercise. Each of these session types are described in detail below.

Diabetes Education. The purpose of the diabetes education series is to provide basic knowledge and tools for the participants to successfully manage their diabetes. Through the utilization of participants' cultural beliefs and customs, elder Latino diabetics learn to better control their disease. The primary ways the collaborators chose to emphasize Latino culture included instruction in the Spanish language of a familiar dialect, the strong familiar orientation and participants' desire for peer support, and the use of foods typical of their normal diet. These factors were identified by the three collaborators from many years working with the community. The Senior Center program administrator was the first Latino in her position at the Senior Center and had lived in the community most of her life. The dietician and the nurses learned to communicate through interpreters. The dietician worked closely with the Senior Center chief cook, who was a Latina from the community, to identify and use foods familiar to the audience, and to clarify ways in which the foods could be prepared in a healthier manner. Ongoing collaboration and prior affiliation with the Senior Center program administrator gave face validity to their leadership in the program.

There are six topics addressed over the 10 weekly sessions. The topics include the following:

- Introduction to the program" includes a description of the subsequent sessions and performance of blood draws for HbA1c and lipid profiles. Blood pressure, height, and weight are also measured for each participant
- Cardiovascular disease and diabetes" is focused on blood pressure and cholesterol control. Interpretation of blood work is discussed in terms of actions participants can take to improve their results.
- What is diabetes?" includes differentiation of Type 1 and Type 2 diabetes, description of insulin resistance, and the importance of diet, exercise, and medications in lowering blood sugars.
- Medications to lower blood sugar levels" is explored to help the participants understand how the medications work and how they should be taken. Additional attention is given to how to prevent or treat the signs and symptoms of hyper- and hypo-glycemia.

- Foot and skin care” emphasizes actions participants can take to prevent infection and amputation.
- Prevention of the complications of diabetes” includes care of the eyes and teeth and the importance of immunizations. Pneumonia vaccine is offered to those who have not had it.

The nurse is available four hours a week for individual consultation and teaching. Follow up support groups are provided at the end of the 10 weeks to reinforce and expand diabetes education for participants who choose to attend. Through the support groups the leaders identify and encourage participants who learn better self care to share their knowledge with others as “Promotores de salud.” These individuals are identified because of the improvements they experience in the measures taken, because of the enthusiasm they express about the benefits of the changes they experienced, and their frequent attendance. The final session once again involves drawing blood for HbA1c and lipid profiles. A ceremony caps the program to present certificates for successful completion by the participants.

Nutrition Modeling. Nine topics are taught regarding improving the diet of the participants. A meal is served at each session, with the menu corresponding to the topic. A Latino caterer prepares the meals at the Senior Center using authentic recipes modified by the project nutritionist. Participants practice “carbohydrate counting” at every session. Participants learn which foods are considered “carbohydrate choices” for each meal and what the portion size is for each carbohydrate choice. Participants learn how to choose from 3-4 servings of carbohydrate per meal at every session. The tenth and final session is a wrap-up, encompassing all of the lessons from the previous weeks on nutrition, listening to feedback from the participants on their diet changes, and showing with 1- and 5-lb. weights the amount of weight lost by participants.

- “The effect food has on blood sugar” emphasizes how blood sugar varies depending on what is eaten.
- Understanding Carbohydrate Foods” includes specific instruction in what foods are low and high in carbohydrates and how to spread them over the course of the day. Each session reinforces appropriate portions of carbohydrate to eat at meals.
- “Recognizing food groups and measuring portions” uses reference materials in Spanish from the American Diabetes Association to illustrate how to eat an appropriate variety of foods. Latino foods are used as examples.
- “Food label” education involves learning how to read a nutrition facts label and how to use the information to select healthy foods.

- “Saturated Fat, Trans Fat, and Cholesterol” identifies Latino foods high in saturated fat and cooking methods to lower the amount of fat that is eaten. It emphasizes the difference between healthy and unhealthy fats.
- “Fiber” identifies foods with low and high fiber content and emphasizes ways to increase fiber intake.
- “Sodium and hypertension” identify foods with low and high sodium content and emphasizes ways to decrease sodium intake.
- “Virtual Grocery Store Trip” helps participants identify foods to incorporate into a healthy diet. Detailed attention is given to how to shop the aisles around the periphery of the store. Participants are encouraged to bring food items from home that they have questions about or would like to show to the group.
- “Special occasion” helps participants to recognize strategies for meal plans on special occasions or eating out.

Many informal conversations take place during this time together as well as during the weekly sessions. During the informal discussions, the group leaders encourage participants to engage their whole households to learn about what is a good diet for someone with diabetes. Practical suggestions are offered for planning meals that are good for everyone, not just the one with diabetes. Portion control is emphasized throughout all sessions. Guidance is also given for what snacks a diabetic should take along when leaving home for many hours at a time.

Walking and Exercise: Exercise is presented as a walking club and is attended by those currently attending the 10 weeks of classes and those who have completed them. A nurse from Home Health VNA leads the exercise activities including preparation, warm-up, “pass-the-sugar” (explanation below), resistance, stretching, walking, and positive attitude.

Preparation: Participants are advised to test their blood sugar, eat breakfast, take their medications and drink adequate fluids before arriving at the center. They are issued red caps and t-shirts and encouraged to wear well-fitting walking shoes, socks, sunscreen, and sunglasses as well as temperature-appropriate outerwear. They are also encouraged to carry a carbohydrate snack and identification while walking. The group walks outdoors if it is not raining or snowing, and the temperature is above 55 degrees. In the event of inclement weather, the session is held indoors in an exercise class format. Clients are reminded to exercise within their own limitations and to discontinue any activity that causes pain. Information about the benefits of exercise for diabetics is interwoven with the explanations and demonstrations of the various modes of exercise. The following is a general description of a forty-five minute session:

Warm-up: The group begins by walking from the center to the park across the street, and form a circle in a grassy area. The leader gives a brief introduction and then begins with group singing while stepping back and forth and clapping.

Pass the Sugar: The leader introduces 10-inch plastic balls which she calls “sugar.” She explains that when people exercise their muscles burn sugar and that a fit muscle burns more sugar than a weak muscle. The group passes the balls around the circle as quickly as possible, saying “pass the sugar, pass it quickly.”

Resistance: In the circle, the group does various resistance exercises with stretch bands for muscle toning. Each participant is issued a stretch band to take home, so that these exercises, along with walking, can be done daily throughout each week. The exercises involve various muscle groups, but are all done from a basic standing position, as we do not have mats and we are meeting on grass.

Stretching: Group stretching exercises were designed to increase flexibility for participants to increase their comfort and prevent injuries. Many of the exercises used in the program can be found in the National Institute on Aging’s Exercise Guide entitled *El Ejercicio y Su Salud*.²⁰

Walking: The class splits into three groups, fast, moderate, and slow, and each person has the option to choose her/his group. The fast group walks around the park in one direction, while the moderate and slow groups walk in the opposite direction. In this way, we see each other and offer smiles, laughs, and words of encouragement as we pass one another.

The fast group usually completes two laps around the park (1.5 miles). The moderate group walks one lap, and the slow group completes approximately .5 miles based on their own capacity. Everyone is congratulated for doing what he or she can do.

Positive Attitude: The emphasis is on having fun and enjoying being outside. The leader encourages the participants to walk and exercise every day, in whatever manner they can, stressing the idea that they have diabetes every day, not just the perfect sunny days. Our mantra, repeated during the resistance exercises is: “Hago ejercicios cada dia para una vida mejor”; in English: “I exercise every day for a better life.”

Results

Clinical Results. For the comparisons of diabetic health of 222 participants before and after the intervention, paired t-tests were conducted on measures of HbA1c, total cholesterol, triglycerides, LDL, HDL, and fasting glucose. Two of the six measures showed significant improvement from the beginning to the end of the 10-week intervention period, triglycerides, and HbA1c. The 0.4 drop in HbA1c was consistent with the small pilot group. The other measures changed in a positive direction, but failed to reach a significant level over the short intervention period.

Table 2. Clinical Results from Senior Center 10-Week Intervention

Pre-post t-test:	N	Mean Pre Measure	StDev Pre	Mean Post Measure	StDev Post	t-test P=
HbA1c	221	8.2	2.0	7.8	1.7	< .001*
Total Cholesterol	222	194.3	46.8	189.7	45.7	.06
Triglycerides	222	160.7	79	151.5	75.6	.04*
LDL	218	109.9	39.7	106.8	36.3	.12
HDL	222	52.9	11.2	52.5	11.1	.48
Fasting Glucose	212	135.2	51,2	128.2	52.5	.11

Other Results. A questionnaire of 15 items about diabetes and self care were also administered at the beginning and end of the intervention period for each group. Appropriate responses improved on 13 of the 15 items. Significant improvement (see Table 3) was demonstrated on items 1-6, 9, 12, 14, and 15 (See Figure 1). On the remaining items there was non-significant change. Items 7, 8, and 10 were not likely to show significant improvement because over 90 percent of the participants responded correctly on the pretest. Items 11 and 13, however, did not show any improvement, even though only 72 percent responded correctly on the pretest.

While there is conflicting data on the effectiveness of pre- and post-intervention surveys – some studies indicate an innate bias in the self-reporting method²¹, where others maintain that any improvement shown in the results signifies success of the educational program.²² Given the comments below from the participants and the long-term improvement in some clinical outcomes for the group, the results of this pre/post survey showed reasonable educational benefits of the senior center program.

**Table 3. Pre-Post Knowledge Test Results Senior Center -
10-Week Intervention**

Pre-post item #:	Pre # Incorrect	Pre #Correct	Post #Incorrect	Post #Correct	Chi square p =
1	58	163	17	185	1.62E-06
2	16	202	4	199	0.00966
3	66	154	40	167	0.010702
4	142	75	66	137	1.54E-11
5	167	54	100	102	2.87E-08
6	54	167	22	184	0.000205
7	20	200	24	182	0.385679
8	22	199	17	188	0.552281
9	53	167	19	186	4.69E-05
10	10	208	7	195	0.559982
11	62	159	43	160	0.101494
12	87	134	35	166	6.75E-07
13	62	159	69	136	0.210419
14	129	92	35	168	3.72E-118
15	74	142	46	158	0.007928

Many of the participants have continued to participate in follow-up support groups and exercise classes, which is an indication of the continuing interest in self care. The demand for the exercise activities led to sessions three times a week, each supervised by a VNA nurse. Over 30 participants per week continue to attend support group meetings which are facilitated by a social worker on the REACH 2010 staff and by the VNA nurse. Also, on an ad hoc basis, many of the participants assist with the new groups as they experience the 10-week classes. The assistance from these individuals has been informal to date, including helping to prepare and serve food during nutrition education and leading parts of the physical activity sessions. The project leaders are now developing a way to involve these individuals as “trainers” for a diabetes prevention “tool kit” workshop. The prevention workshop is being offered throughout the community by interested individuals who volunteer to teach others. Several potential leaders have been identified for a train-the-trainer session before 2006. Below are common examples of comments by participants who evaluate the intervention very highly:

- “I have enjoyed the diabetes class, and have learned a lot. I completed the ten sessions. I am sad that the program ended, but will continue in the walking club.”
- “I am proud of myself for finishing the 10 sessions in the program. I have learned a lot, especially how to eat in portions. Now I can keep my diabetes in control.”
- “The information I learned has helped me to recognize how important it is to take care of myself as a diabetic. Topics as foot care, eye care, level of cholesterol were helpful, as well as portion control.”
- “I am glad the class wasn’t boring. We learned, but we were able to be ourselves. I also liked the open discussions.”

Figure 1. Knowledge of Diabetes and Self-Care: Survey

- 1.) How does having diabetes make you feel?
 - a. Angry
 - b. Sad
 - c. Helpless
 - d. I feel that I have accepted it and that I am taking care of it.
- 2.) Do you believe that:
 - a. You can take care of you diabetes and stay healthy
 - b. There is nothing you can do to prevent the complications of diabetes
- 3.) What do you believe is the best way to keep your blood sugar normal?
 - a. Medication
 - b. Diet
 - c. Exercise
 - d. A combination of the above
- 4.) On a scale of 1 to 10, please rate: How well you think you take care of your diabetes?

1	2	3	4	5	6	7	8	9	10
Poor		Fair		Good		Very Good		Excellent	Perfect
- 5.) On a scale of 1 to 10, please rate: How healthy do you feel?

1	2	3	4	5	6	7	8	9	10
Poor		Fair		Good		Very Good		Excellent	Perfect
- 6.) What do you think causes blood sugar to be high
 - a. Eating too fast
 - b. Eating rice and beans
 - c. Eating portions that are too big
 - d. I don’t know
- 7.) Is it better for a diabetic to eat:
 - a. 1 big meals per day
 - b. 5-6 small meals per day
 - c. Only when hungry
 - d. I don’t know

- 8.) Which is not a healthy way to cook a meat?
 - a. Baking it in the oven or cooking on the grill
 - b. Frying it
 - c. Boiling or microwaving
 - d. I don't know
- 9.) What is more important to look for on a nutrition label?
 - a. The grams of sugar in the food
 - b. The grams of carbohydrates in the food
 - c. I don't know
- 10.) Manuel Tests his blood sugar everyday and writes the results in his book because:
 - a. The doctor told him to
 - b. The strips are free
 - c. It helps him learn what makes his blood sugar go up and down
 - d. I don't know
- 11.) Which of the foods listed below raise blood sugar the most?
 - a. Salad
 - b. Rice and Beans
 - c. Chicken
 - d. I don't know
- 12.) A diabetic should pay special attention to:
 - a. Care of the feet
 - b. Eyes
 - c. Blood Pressure
 - d. All of the Above
- 13.) It is important that a diabetic take his medication or insulin:
 - a. Everyday, even when he is feeling well
 - b. Only on days when he is not feeling well
 - c. Only when his blood sugar is high
 - d. I don't know
- 14.) When someone's blood sugar is too low, how would they feel?
 - a. Thirsty
 - b. Nervous, shaky, and irritable
 - c. Energetic
 - d. I don't know
- 15.) Which of the following activities will help to lower blood sugar?
 - a. Watching T.V.
 - b. Playing Dominos
 - c. Exercising (walking, etc.)

Answer Key: 1. N/A 2. N/A 3. D 4. N/A 5. N/A 6. B 7. B 8. B 9. A 10. C 11. B 12. D
13. A 14. B 15. C

These results are meaningful on several counts—the intervention was completely designed by members of community, in just 10 weeks significant changes occurred on measures of blood sugar control and lipid profile. Equally as important, elder Latino participants continue to express

high motivation to change their own health. One of the most rewarding observations by project staff was the physical observations of pride from participants as they mastered skills to keep themselves healthy. Many very serious and sad faces turned into smiles and laughter by the end of the sessions. The overall atmosphere is one of optimism and a feeling that they have some control over their health and well being. They appear to have taken control of their own destiny. For example, one woman used her new-found knowledge of diabetes management to tell her doctor that a blood sugar of 300 was unacceptable, and that if he did not assist her in lowering her blood sugar, she would find another doctor.

While the descriptive design of this study did not include a control group, the degree of positive change across groups was a consistent finding. Further investigation is underway to determine the extent to which the improvements were sustained following the intervention. The participants consented to being followed through their medical records on the study variables. Many of them are patients of primary care physicians in Lawrence who have agreed to participate in the study.

CONCLUSIONS

The results of this study showed that the Senior Center intervention led to meaningful changes in participants' views of diabetes and the extent of control they could have over their diabetes. Education about how to prepare healthier Latino meals, to control portion size, to stay active, and to provide self-care can clearly lead to better health outcomes. Experience of these better outcomes can overcome widespread fatalism among Lawrence Latinos regarding diabetes. The old view that a diagnosis of diabetes was a sure sign of impending severe sickness and death can be changed. Whereas improvement in the medical care of diabetes in Lawrence has been documented, this is the first community-based participatory research study to be reported with this population of elder Latinos who have diabetes and are predominantly of Puerto Rican and Dominican origin.²³

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