

# Cultural Approaches to Diabetes Self-management Programs for the Latino Community

*Andreina Millan-Ferro, and A. Enrique Caballero, MD*

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## Corresponding author

A. Enrique Caballero, MD  
Latino Diabetes Initiative, Professional Education, Joslin Diabetes Center, Harvard Medical School, One Joslin Place, Boston, MA, 02215, USA.  
E-mail: enrique.caballero@joslin.harvard.edu

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The issue of diabetes within the Latino population of the United States is of such magnitude that reviewing previously published studies on culturally oriented diabetes self-management interventions is imperative to further understanding and progress on this matter. The purpose of this revision is to illustrate what has been accomplished to date, analyze the lessons learned, and restate the importance of developing culturally relevant interventions for vulnerable populations.

## Introduction

The Hispanic or Latino population represents the largest and fastest growing minority group in the United States [1]. According to the latest US census data from 2004, Latinos in the country represent 14.2% of the total US population; it is estimated that by 2050 this group will represent 24% of the total population in the country [2]. The largest Latino groups are Mexican Americans (66%), Central/South Americans (15%), Puerto Ricans (9%), and Cuban Americans (4%).

Latinos have a twofold increase in the risk of developing type 2 diabetes compared with the white population [3–5]. A clear genetic predisposition for the development of diabetes plays an important role in establishing this risk [6••]. However, a significant role is also played by cultural and lifestyle factors [6••]. In addition, the rates of obesity, the metabolic syndrome, and the prediabetic state in this population have also been reported to be significantly higher than in the non-Hispanic white group [7]. An alarming increase in the rate of type 2 diabetes among Hispanic children and adolescents has also been

recognized, adding to the already dramatic burden of diabetes in this group [8]. National figures also suggest that diabetes control and other diabetes-related outcomes are worse in Hispanics than in whites [9,10]. Therefore, there is a clear need to prevent and improve diabetes care among Latinos in the United States.

Diabetes self-management education (DSME) is a critical element of care for all people with diabetes and is considered necessary to improve patient outcomes [11]. Diabetes self-management programs aim to assist people with diabetes in their path toward acquiring knowledge, learning skills, modifying behaviors, and changing attitudes to improve clinical outcomes, health status, and quality of life. To be more effective, programs should take into consideration cultural factors that influence the development and progression of diabetes [6••,12,13]. To identify culturally oriented programs that have implemented an intervention to improve diabetes self-care management among Latinos with type 2 diabetes, we conducted a search in the medical literature using PubMed based on the following criteria: 1) publication date within the past 15 years, and 2) keywords Latino or Hispanic, and diabetes self-care management or diabetes programs. The following is a summary of the identified programs.

## The Diabetes Assessment, Nursing, Nutrition, and Dental Evaluation Project

The Diabetes Assessment, Nursing, Nutrition, and Dental Evaluation (DANNDE) Project was a collaborative effort of the school of nursing; allied health, medicine, and dentistry; and the South Texas Geriatric Center at the University of Texas Health Science Center in San Antonio, Texas [14]. This project assessed the impact of an intensive, culturally specific diabetes education program on dietary patterns and nutrient consumption compared with the recommended dietary allowances in a group of 152 Mexican-American men and women with type 2 diabetes in the border towns of Texas. This was a randomized controlled trial in which the intervention consisted of 2-hour nutrition education sessions for 8 weeks given by registered nurses (RNs) to groups of eight to 10 participants.

Each session began with the viewing of a bilingual videotape (8–15 minutes) in the format of television dramas, followed by a group discussion. The topics of the education program followed the American Diabetes Association (ADA) recommendations and included nutrition (food choices, food preparation, decreased fat consumption, and the importance of fruits, vegetables, and whole grains), hypertension, eye care, foot care, oral health, and kidney-related complications. Two-hour follow-up sessions were conducted at weeks 10 and 14 after the completion of the program. The control group was not exposed to any intervention.

All groups experienced significant weight loss, except the women in the experimental group. A possible explanation is that this subgroup increased the percentage of calories consumed daily from carbohydrates. However, positive trends were observed during the study regarding food consumption in the study group. Researchers considered that videos specifically tailored to low-literacy Latinos seemed to contribute positively to the results observed regarding improvements in diet.

### Project Dulce

Project Dulce was developed in 1998 by a collaboration of a group of health care organizations of San Diego, California. The project goal was to improve quality of care, and thus quality of life and health among uninsured, low-income minority patients with diabetes through a culturally appropriate, community-based, nurse case management/peer education diabetes care model. This project consisted of two major components: 1) clinical care, and 2) health promotion and education. Trained peers from the target communities delivered the patient education and participated as culturally sensitive community health workers (promotoras).

In an initial pilot study, Project Dulce demonstrated an improvement in patients' sense of empowerment and medical outcomes and identified common barriers to diabetes care among Latinos, such as insurance coverage, language, and cultural factors [15].

In a second-phase study, they enrolled 153 high-risk patients (70% Latino) with type 1 and type 2 diabetes recruited from six community clinic sites in San Diego County, California, into the nurse case management and peer education/empowerment group. The intervention consisted of a combination of nurse management and group education delivered by promotoras to achieve self-empowerment. An RN/certified diabetes educator with extensive experience led the case management component and worked with a team that included a bilingual/bicultural medical assistant and registered dietitian who traveled each day to a different clinic. The RN was trained to use the protocols in staged diabetes management for changes in diabetes medications. The dietitian was available for two visits of 45 minutes per participant. The

medical assistant was responsible for translation and vital signs. Each participant underwent a 2-hour baseline visit. A minimum of four follow-up visits per year was advised. The peer education component consisted of 12 weekly 2-hour sessions about diabetes and its complications. These classes were held in the promotoras/patients' language and discussed diabetes and its complications as well as the role of diet, exercise, medications, and self-glucose monitoring in diabetes control. The class also included an interactive component in which patients discussed their fears, personal experiences, and beliefs about diabetes. They compared the intervention with 76 individuals in a matched control group derived from patients referred to, but not enrolled in, the intervention.

The nurse case management and peer education/empowerment group had significant improvements after 1 year in hemoglobin A<sub>1c</sub> (HbA<sub>1c</sub>) (12.0% vs 8.3%,  $P = 0.0001$ ), total cholesterol (5.82 vs 4.86 mmol/L,  $P = 0.0001$ ), low-density lipoprotein cholesterol (3.39 vs 2.79 mmol/L,  $P = 0.0001$ ), and diastolic blood pressure (80 vs 76 mm Hg,  $P = 0.009$ ). No significant changes were noted in the control group. The program also resulted in improvements in diabetes knowledge, self-efficacy, ADA standards of care, treatment satisfaction, and culture-based beliefs [16•].

### The Starr County Health Initiative

The Starr County Health Initiative in Texas began with a community assessment through focus groups and interviews conducted with key people in the community to accomplish the goal of designing a health care intervention that addressed the unique needs of the Mexican-American population they were going to serve [17]. An intervention designed to improve diabetes-related outcomes was developed. This intervention included 52 contact hours through two different activities: 1) weekly 2-hour education sessions for 3 months on nutrition, exercise, self-monitoring of blood glucose, and other self-care topics; and 2) 14 biweekly 2-hour support group sessions to promote behavior changes through problem solving and food preparation demonstration. Dietitians, nurses, and community health workers led these activities. A total of 256 Mexican-American participants with type 2 diabetes were randomly assigned to the intervention or control group. The entire intervention was culturally appropriate regarding language, diet, family participation, and health beliefs. People enrolled on a wait list who were not able to participate in the program were included as a control group. The experimental group had significantly lower fasting blood glucose and greater knowledge at 12 months. No significant difference between groups was found for body mass index, lipids, or health beliefs. This study showed that culturally competent DSME is effective in improving health outcomes among Mexican Americans, particularly for individuals with HbA<sub>1c</sub> above 10%.

A compressed version (eight weekly 2-hour educational sessions followed by support sessions held at 3, 6, and 12 months) was compared with the original year-long intervention in a randomized clinical trial of 170 patients with type 2 diabetes. The same information was covered in both interventions, but the time spent on each topic differed depending on the group. Both groups exhibited an improvement in metabolic control and diabetes knowledge. A dosage effect was evident whereby more sessions resulted in greater improvement in diabetes control [18••].

### Tomando Control de Su Salud

Tomando Control de Su Salud is the Spanish version of the community-based Chronic Disease Self-Management Program (CDSMP) that was shown to be effective in a randomized control study in Mexican-American adults with varied chronic illnesses (45% with diabetes) at improving self-care behaviors, health status, health care utilization, and self-efficacy sustained for 1 year [19]. Both the Spanish and English versions of this community-based program consisted of a 14-hour education intervention administered in 2.5-hour sessions over 6 weeks. The educational sessions covered topics that included, but were not limited to, fitness, healthy eating, action planning, relaxation, depression, family relationships, and medications. A peer leader conducted these sessions in a community (churches, neighborhood centers, and clinics). These leaders received 4 days of training by project staff members in the use of the protocol, including two practice teaching sessions. Groups in the community consisted of 10 to 15 participants, including family members and friends. The program for Latinos/Hispanics (Tomando Control) was not a direct translation of the English version; it took into account the Latino culture. The adjustments made were based on information from focus groups. An important distinction from the English version relevant to the Latino culture was the inclusion of a substantially more extensive section on healthy eating. The evaluation of this program was recently extended to other populations along the Texas/New Mexico/Mexico border [20•]. A total of 319 participants (67% with diabetes) exposed to the program were found to improve health behaviors, health status, health care use, and self-efficacy. Follow-up data were collected through regular mail or by phone at 4 and 12 months. To assess improvement on health behaviors, they included a physical activity scale and a single question about relaxation techniques; to assess diet, they included the frequency at which breakfast was consumed. At baseline, the mean number of times breakfast was eaten per week was 5.53 plus or minus 2.4. At 4 months, it increased by 0.915 plus or minus 2.44 ( $P < 0.0001$ ).

### Noel et al.

Noel et al. [21] conducted a randomized control trial in the Southwest, mostly among Mexican Americans, to

examine the effect of a patient's choice between two possible curricula on their subsequent class attendance and other outcomes. The hypothesis was that patients who were allowed to choose their curriculum would have higher attendance rates and improved knowledge than those who were randomly assigned to a curriculum. The standard curriculum, based on the ADA's recommendations for type 2 diabetes, included 60% of the content devoted to non-nutritional management and 40% to nutritional management. It also provided a meal plan and advice to make several dietary changes at once. The nutritional curriculum used in this study devoted 60% of the content to nutritional management practices. Instead of the meal plan, it used the food pyramid as a guideline and promoted gradual, continuous changes in eating habits. A total of 596 participants were enrolled in the study. Eligible participants were randomly assigned to either a choice or no-choice condition. Patients in the choice condition were provided with written, neutral descriptions of the two curricula and were subsequently assigned to the curriculum of their choice. The participants in the no-choice condition were randomly assigned to one of the two curricula. The opportunity to choose the language version of the curriculum was given to all participants. They also attended a weekly 2-hour session for 5 weeks at no cost. The curricula were taught by different groups of educators. Of the 596 patients included in the study, 30% never attended any classes. Of all patients in the choice condition, 78% chose the nutrition program. Four times more patients chose the nutrition curriculum. No significant differences in the number of classes attended and diabetes knowledge between the choice and no-choice groups were identified. Those individuals participating in the nutritional curriculum had a more significant improvement in serum cholesterol at 6 months, whereas those participating in the standard curriculum had a more significant improvement in metabolic control, as measured by  $A_{1c}$  levels.

### Rosal et al.

Rosal et al. [22] conducted a pilot study in Boston, Massachusetts, to examine the feasibility of a future randomized clinical trial to test the efficacy of a self-management intervention in low-income, Spanish-speaking Puerto Ricans with type 2 diabetes. Patients were eligible if they had type 2 diabetes, a health care provider, a home phone, a doctor's clearance for physical activity, and were older than 18 years of age. Fifteen patients were enrolled in the intervention group and 10 in the control group. The intervention consisted of a 1-hour individual session followed by 10 weekly group sessions (2.5–3 hours each), each prefaced by an individual session (15 minutes each). A diabetes nurse, a nutritionist, and an assistant delivered the intervention. The focus of the intervention was on diabetes knowledge, attitudes, and self-management skills. These self-management skills included physical activity, diet,

adherence to medications, and blood glucose monitoring. This intervention was adapted to a low health literacy audience and incorporated culturally relevant characteristics of the Latino culture, such as family and drama (soap operas), and used the concept of the traffic light to convey educational messages. As a result of the intervention, Spanish-speaking Puerto Ricans exhibited a greater decline in  $A_{1c}$  levels compared with the control group (which wasn't exposed to the intervention), and also had a positive trend toward increased physical activity and self-monitoring blood glucose practices. They also observed statistically significant changes in depression symptoms after 3 months in the intervention group. However, after 6 months, the size of the effect was reduced and not significant. This pilot study showed that it is feasible and desirable to conduct a randomized clinical trial to evaluate the effectiveness of the intervention on an adequate sample size.

### Tomando Control

The Tomando Control is a program that was tested in a pilot study to assess the feasibility, acceptability, and efficacy of a culturally appropriate and culturally relevant cognitive-behavioral diabetes self-care education program conducted in the Spanish-language for Hispanic Americans with type 2 diabetes [23]. The study was conducted in an urban community of southern Connecticut and had 16 participants. The intervention lasted for 6 weeks and consisted of 3-hour weekly cognitive-behavioral sessions in Spanish at a health center. The curriculum used for the intervention was the 2001 edition of the ADA-accredited *Taking Control* developed by Philadelphia's Health Promotion Council. During the sessions, participants were encouraged to share experiences about diabetes self-management. The evaluation included demographic, physiologic ( $HbA_{1c}$ , body mass index, and lipids) and psychosocial measures (diabetes-related distress and health beliefs), diabetes-related knowledge, and acculturation taken at baseline, at 3 months, and at 6 months following the intervention. Most participants were from Puerto Rico, had insurance coverage, and identified Spanish as their preferred language. Over the 6 months of the study, both men and women showed an increase in knowledge scores, improvement in lipid profiles, and a reduction in  $A_{1c}$  levels. During the first 3 months of the study, men demonstrated a temporary increase in emotional distress much greater than that reported by women. The study demonstrated the feasibility of conducting an intervention in this population. Some of the potential clinical implications derived from this study include an awareness of gender differences, the importance of providing realistic samples of meals, and the need for a refresher course on diabetes education.

### Banister et al.

Banister et al. [24] implemented an intervention of 70 patients with type 2 diabetes to assess the effectiveness of

a diabetes self-management training program at a community clinic in Texas. Thirty-nine participants were Hispanic and the rest were primarily African American. The intervention consisted of a 4-hour class followed by individual consultations with a dietician and monthly support meetings. Two certified diabetes educators and one registered dietician conducted the intervention. All participants received a glucometer. Following 2 to 12 months in the program, a significant reduction in mean  $A_{1c}$  was observed (9.7% to 8.2%). In addition, 61% of the patients experienced positive medication outcomes. The cost of community clinic diabetes self-management training was approximately \$280 per person per year. It was estimated that each point reduction in  $A_{1c}$  costs \$185. The authors concluded that this improvement in  $A_{1c}$  levels was obtained with a modest increase in cost.

### Corkery et al.

Corkery et al. [25] conducted a randomized control study to evaluate the effect of the incorporation of a bicultural, bilingual Hispanic-American of Puerto Rican heritage (belonging to the same neighborhood) into the team of specialists as a community health worker (CHW). They looked specifically at the likelihood of the completion of a diabetes education program upon the addition of this new member to the team. The study was set in a nurse-managed diabetes management clinic in East Harlem, New York. Participants were eligible if they were newly referred to the clinic for patient education and were 20 years of age or older. Of the 64 participants enrolled in the study, 74% were women and 75% identified their country of origin as Puerto Rico. Only 26% of the participants spoke fluent English. The control group had 34 participants, whereas the intervention group had 30. Diabetes knowledge, patients' self-reported diabetes self-care behaviors, and glycohemoglobin levels at baseline and upon completion were used to evaluate progress. All patients received individualized, comprehensive, diabetes education from a certified diabetes nurse educator following the ADA Standards for Diabetes Education. Participants in the intervention group worked directly with the CHW, who functioned as a liaison among the patients, their families, and the health care providers; served as an interpreter during patients' visits; reminded and rescheduled patients' visits; and reinforced self-care instructions. The control group did not have the presence of a CHW. This intervention demonstrated that the integration of a CHW had a positive impact on program completion; 80% of the participants in the intervention group completed the program, compared with 47% of the control group. This study also showed that participants who completed the education program had better outcomes (glycemic control, diabetes knowledge, and changes in health care behaviors) irrespective of the participation of the CHW.

## The Racial and Ethnic Approaches to Community Health Detroit Partnership's Diabetes Lifestyle Intervention

The Racial and Ethnic Approaches to Community Health (REACH) Detroit Partnership's Diabetes Lifestyle Intervention developed culturally oriented, behavioral-change curricula for African Americans (*The Journey to Health*) and Latinos (*El Camino a la Salud*) with type 2 diabetes [26]. They first conducted focus group research to guide the general content, method of delivery, and format of the intervention. During this phase, the authors recognized barriers to healthy diet and physical activity, and the importance of family support for diabetes management. Participants recommended that the educational program be conducted in the community by facilitators who were able to relate to their reality. They used a diabetes lifestyle intervention, *Strong in Body and Spirit*, which was originally designed and evaluated among Southwest Native Americans with type 2 diabetes. The necessary modifications were made, based on previous focus groups, to tailor the program to the specific needs of the Latino and African-American cultures. Five 2-hour, monthly meetings were held. Community residents, who had received the family health advocates training, delivered the curriculum. A registered dietitian and certified diabetes educator supervised them. Participants were encouraged to bring family members and friends. A total of 151 individuals participated in the intervention. A comparison group from the same clinic was included in the study. There were statistically significant improvements noted in the intervention group after the intervention  $A_{1c}$  levels as well as dietary and physical activity knowledge and behaviors, whereas no statistically significant improvements were noted in the control group.

The aforementioned programs, their locations, their patient populations, and the main lessons learned from each are presented in Table 1.

## Conclusions and Discussion

As with any other ethnic group, the Latino population is rich in traditions, culture, and beliefs. As this group continues to increase in the United States, a clear need to develop culturally oriented programs to improve their diabetes care has emerged. Some of the identified studies in this article have revealed common challenges when working with this high-risk population, such as the lack of bilingual and bicultural staff, low cultural awareness among health care providers, scarce bilingual educational materials for low health literacy patients, lack of insurance coverage, immigration status, high attrition rates, and low funding and resources. Our own experience in the Latino Diabetes Initiative also supports these challenges [6••]. Our initiative integrates a clinical care and patient educa-

tion program, outreach activities, a research component, and professional education activities. In the preliminary results from one study, we identified that social and family support, having a provider who speaks the same language, receiving prescriptions in Spanish, having good rapport with the health care provider, and scoring low levels of diabetes-related distress and depression were associated with higher adherence to nonpharmacologic and pharmacologic treatment guidelines [27,28]. In our experience, Latino women with type 2 diabetes who live alone represented the group with the lowest social-family support level. This group exhibited lower adherence to diet, more frequent fatalistic views, and more uncontrolled diabetes than those living with others [29].

Most of the interventions described in this review incorporate a comprehensive and culturally oriented diabetes self-management intervention to address some of the challenges described earlier. The duration of the intervention varied from 6.5 to 52 hours, conducted over 1 to 12 months, with a follow-up period ranging from 1 to 12 months following the completion of the intervention. A consistent finding among these studies was the high level of satisfaction and gratitude expressed by participants in these culturally oriented interventions.

A trend toward developing and implementing newer approaches to patient diabetes education is also tangible. The DANND project, the Starr County Health Initiative, and Rosal et al. [22], among others, successfully used nontraditional, nonwritten patient education materials, such as videos or drama (soap operas), designed for low health literacy patients. Along this line, our group conducted an observational and feasibility pilot project to assess the acceptance of the storytelling method in an audio format (audiotape) in conjunction with a brochure depicting a story of a Latino patient with type 2 diabetes. In comparison to a traditional, written educational piece, the storytelling method resulted in more positive changes regarding exercise, diet, and physical activity, as well as general information recall about diabetes [30]. As a consequence of these positive results, we have developed *Rosa's Story/La Historia de Rosa: An Audio-novella for Latinos with Type 2 Diabetes, and Their Families*. This audio-novella is now being tested in a randomized controlled trial.

The reviewed studies have shown that a culturally oriented intervention that takes into consideration multiple social, financial, and cultural aspects of the target population is likely to improve some diabetes-related outcomes. However, the challenge resides in how to integrate more comprehensive programs that could be implemented in larger populations and perhaps replicated by others. Randomized clinical trials are thus necessary to identify those cost-effective strategies that may improve diabetes care among Latinos with diabetes.

**Table 1. Main lessons learned from culturally oriented interventions for Latinos/Hispanics with diabetes**

Project/location	Hispanic group	Main lessons learned
DANDE project/Texas [14]	Mexican American	Interventions of longer duration are necessary. Videos tailored to low-literacy Latinos may be beneficial
Project Dulce/California [15,16•]	70% Mexican American	Peer educators may effectively educate patients. Effective model for uninsured populations. A randomized clinical trial is needed.
Starr County/Texas [17,18••]	Mexican American	The greater the number of educational sessions attended, the greater the benefits. Importance of social-cultural context for the design and implementation of interventions
Tomando Control de Su Salud/Texas, New Mexico, Mexico border [19,20•]	Mexican American	A comprehensive, culturally oriented program developed by a team for a minority group can be implemented in other settings by other teams
Noel et al./Southwest [21]	85% Hispanic (unspecified)	Allowing patients to choose curriculum does not necessarily improve outcomes. A nutrition-based curriculum is more likely to improve lipid profile than the standard
Rosal et al./Massachusetts [22]	Caribbean Latino, mainly Puerto Rican	Low health literacy, family orientation, and drama (soap operas) may be important components of an educational program
Tomando Control/Connecticut [23]	Unspecified	Awareness of gender-based differences in self-care practices must be considered. Provide realistic sample meals. Need for a refresher course
Banister et al./Texas [24]	Unspecified	Effective intervention may be implemented at a modest cost
Corkery et al./New York [25]	Puerto-Rican origin	CHW can improve program completion
REACH Detroit Partnership/Michigan [26]	36% Hispanic (unspecified)	A culturally tailored curriculum originally designed for Native Americans can be adapted and used effectively for other minority groups
Latino Diabetes Initiative, Joslin Diabetes Center/Massachusetts [6••,30]	Hispanics, mainly Caribbean Latino	The use of storytelling and nonwritten educational materials may improve self-care behaviors and diabetes-related knowledge. Currently conducting a randomized controlled trial to evaluate the impact of a newly developed audio-novella ( <i>Rosa's Story</i> ) on patients' self-care behaviors

CHW—community health worker; DANDE—Diabetes Assessment, Nursing, Nutrition, and Dental Evaluation; REACH—Racial and Ethnic Approaches to Community Health.

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