

**A BILINGUAL DIABETES SELF-MANAGEMENT EDUCATION PROGRAM FOR
HISPANIC ADULTS WITH TYPE 2 DIABETES MELLITUS**

by

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Abstract

The aim of this intervention was to determine whether diabetes self-management education will help Hispanics/Latinos with type 2 diabetes mellitus change unhealthy behaviors and effectively manage their disease. Healthcare free clinics serve a large majority of Hispanic/Latino patients who could benefit from a formalized diabetes education program. A 5-week bilingual program was provided to 10 of 80 Hispanic/Latino patients with diabetes identified in a search through the electronic medical records of a free clinic in Connecticut. From 80 patients interviewed by telephone, 20 expressed interest in participating, of which 10 completed the program. Patients were given pre- and post-tests using the revised Diabetes Knowledge Test and the Diabetes Empowerment Scale-Short Form. The transtheoretical model was applied to assess the patient's readiness for change. Hemoglobin A1c levels, obtained at baseline and at 12 weeks, decreased from 6.89 at baseline to 6.64 at 12 weeks, with average mean .25% reduction. Over the 5 weeks, average weight decreased from 179.1 lb to 176.9 lb; all patients except one maintained or lost weight, for an average 2.2-lb weight loss. Blood pressure readings at 5 weeks had decreased in 70% of patients. In creating an environment where patients receive culturally enhanced comprehensive health care services, the goal of improving health outcomes can be achieved. Because the intervention was small with only 10 participants and of short duration, the results should be replicated with a larger group and for a longer period.

Key words: type 2 diabetes mellitus, Hispanic/Latino, Diabetes Self-Management Education

A Bilingual Diabetes Self-Management Education Program for Hispanic Adults with Type 2 Diabetes Mellitus

Diabetes self-management education (DSME) is a critical element of care for all people with diabetes and is necessary to improve patient outcomes. It is important for health care providers to implement a DSME program for Latinos with diabetes to help meet the Healthy People 2020 target and to improve the lives of their patients. The Healthy People 2020 target is for 62.5% of the diabetic population to obtain formal diabetes education (HealthyPeople.gov, 2015). Findings from the Centers for Disease Control and Prevention (CDC) (2015) indicate that there is a great need for health services to detect and manage diabetes. Data show the greatest need and disparity in the Hispanic population compared to the Caucasian or the African American population (CDC, 2015). Latinos are 66% at higher risk of having diabetes than non-Hispanics whites (CDC, 2011). The Latino population has an increased rate of diabetes-related complications, such as cardiovascular disease (CVD), kidney disease, blindness, amputation and nervous system disease. Hispanics/Latinos have higher hospitalization rates than whites. The Hispanics/Latino population also has a 1.5% higher rate than whites to die from diabetes complications (CDC, 2011).

The focus of this project was to provide the foundation for a DSME intervention specifically geared to the Hispanic/Latino population that effectively improves patient outcomes. The following intervention was based on the National Standards for DSME, which were designed to assist diabetes educators in a variety of settings to provide evidence-based education (Funnell et al., 2011).

Problem Description

Nurses in clinical practice can have a major impact on improving DSME for not just Latino patients but all diabetes patients. Nurses who manage patients referred by their provider for diabetes education may see these patients change from diabetic to non-diabetic status after receiving DSME. Patients who are primarily long-term type 2 diabetics who are having their medication changed over to insulin because of uncontrolled diabetes are taught how to use their diabetic supplies and given an overview of diabetes education. Many patients have specific questions on nutrition and what happens if their blood sugar levels are too low or too high. For example, one of the questions is often “Do I have to take my insulin when my sugar is normal?” In the past, nurses taught patients to read the small lines of an insulin syringe, but now many pharmaceutical companies have produced more user-friendly products. Newly diagnosed patients with diabetes seen today are often in need of basic instruction in nutrition, management of the physical symptoms, use and management of medications, and monitoring. Those who are non-English speaking require a more basic educational approach to the management of their disease rather than a change of direction and instruction.

Many adult free clinics lack a formalized or standard protocol for DSME. These organizations, their patients and staff, would benefit from a standard bilingual DSME program using the recommendations of the American Diabetes Association (ADA) (National Diabetes Education Initiative, 2016) and the Association of American Diabetes Educators guidelines (Burke, Sherr, & Lipman, 2014).

Available Knowledge

Per the diabetes literature, health among Hispanics/Latinos with diabetes appears to be poorer than other populations (Ryan, Jennings, Vittoria, & Fedders, 2013). The cause for this

ethnic disparity has not been determined but the results of many studies suggest that improved diabetes education could make a difference and improve overall health and outcomes.

Hispanics/Latinos need to receive more effective DSME to decrease hemoglobin A1c (HbA1c) levels and reduce diabetes-related complications.

Professional scholarly journal articles on DSME report the minority population to be the fastest growing in the United States. The research shows a correlation between diabetes and the Latino/Hispanic population (Hernandez et al., 2014). Studies that have examined the trends in diabetes self-care among specific racial and ethnic groups in the United States have identified a gap in care in Latinos with diabetes (Chen, Cheadle, Johnson, & Duran, 2014; Baig et al., 2014; Peek, Cargill, & Huang, 2007). One study showed that Hispanics were less likely than whites to receive or engage in most care (Chen et al., 2014). One reason for the disparity of care among Latinos may be the language barrier between non-English-speaking patients/caregivers and non-Spanish-speaking providers (Baig et al., 2014).

Impact of DSME in the Hispanic community. Studies that have examined DSME among Latinos found increased education had a positive impact on patient health. DSME in Hispanic adults with type 2 diabetes has been shown to increase in glycemic control when used with primary care intervention together (Hu, Wallace, McCoy, & Amirehsani, 2014). In addition, it has been shown that community health workers participation has an impact on reduced diabetes-related complications, such as lower rates of amputations, foot ulcers, and had an impact in lowering the HbA1c levels (Prezio, Pagán, Shuval, & Culica, 2014).

Effectiveness of DSME programs. Research has shown diabetes education programs to be beneficial in improving associated health issues such as overweight and obesity

and in enhancing self-care and diabetes management. In addition, diabetes education programs led by community health workers can be cost effective.

It is now known that counseling/education has a greater impact on weight loss than medication or monitoring alone (Azar et al., 2015). The greatest weight loss occurs when diabetics had education/counseling and medication and that a small amount of health education may promote weight loss and may reduce CVD risk (Azar et al., 2015).

Diabetes education programs can have a positive effect on diabetes knowledge and self-management behavior (Ricci-Cabello et al., 2014). The characteristics and effectiveness of diabetes self-management programs to Latino and African American patients in the United States have been evaluated in systemic review, meta-analyses. It has been found that patients enrolled in diabetes self-management programs had a decrease in their HbA1c; a larger decrease in HbA1c was noted with the use of peer education, one-on-one interventions, and using cognitive reframing skills (Ricci-Cabello et al., 2014). A literacy-sensitive, culturally tailored diabetes self-management intervention has been shown to be effective in improving diabetes control in low-income Latinos (Rosal et al., 2011).

Lifestyle modification programs led by community health workers are cost effective for low-income Hispanic adults with type 2 diabetes (Brown et al., 2012). As one program using community partnerships and trained community health workers to reach participants, noted that HbA1c levels at the start of the intervention were above 7% and then decreased to 7% or below after 18 months, compared to other health-management interventions, the cost-effectiveness of this program was similar or better (Brown et al., 2012). The reason the program was successful was that the community health workers live in the same communities as the patients in the

program and are their peers, indicating that culturally sensitive lifestyle modification programs are of benefit to Hispanics with diabetes (Brown et al., 2012).

Rationale

The transtheoretical model of change (also called the stages of change model) was used in this project. This model evolved through studies conducted by Prochaska who examined the experiences of smokers who quit on their own with those requiring further treatment to understand why some people were capable of quitting on their own (DiClemente & Prochaska, 1982). Behavioral change models focus on the individual's decision-making and intentions. The assumption is that change in behavior, in particular habitual behavior, occurs over time and may continue indefinitely through a continuous cyclic process (Hill, Turner, Hunt, & Perko, 2008). Some people move through stages, but most will relapse and return to earlier stages. Another model that would have worked with this project is the transcultural nursing theory developed by Leininger (2002). This model focuses on the importance of understanding different cultures in providing effective nursing care. The impact of the cultural-based curriculum in this DSME program on the outcomes may have been evaluated using this model.

The transtheoretical model is used by providers to help people in all stages of their readiness to change; emphasis is on the process rather than the outcome and relapse is not a setback, but a natural part of the process on the path to a healthier way of living and managing diabetes (Ruggiero, 2000). It serves as a guide to modify behavior interventions to achieve positive outcomes for individuals living with diabetes (Ruggiero, 2000).

Providers are interested in assisting patients to reach optimal levels of blood glucose control. They can help patients optimize blood glucose control by encouraging the following recommended changes in self-care: self-monitoring of blood glucose on a regular basis,

appropriate medication use, diet monitoring for nutrition and eating on schedule, achieve and maintain a healthy body weight, regular engagement in physical activity, hypoglycemia and hyperglycemia recognition and management, assessment of foot health, smoking cessation, and regular visits to healthcare providers (Jones et al., 2003). Helping patients adhere to these recommendations on diabetes self-care behaviors is crucial and involves patients' selection of behaviors to manage their disease (Jones et al., 2003). Graves, Garrett, Amiel, Ismail, and Winkley (2016) report that psychological skills training can have a positive impact in the diabetes education process. Patient empowerment is key in supporting self-care behaviors, and nurses can deliver psychological therapies effectively when they have appropriate training and support (Peña-Purcell, Boggess, & Jimenez, 2011).

Specific Aims

The desired result of the DSME program was that it would address the issues highlighted above by providing high-quality education focusing on teaching the American Association for Diabetes Educators AADE7 Self-Care Behaviors (healthy eating, being active, monitoring, taking medication, problem solving, reducing risks, and healthy coping). The key to the program was bilingual education that accomplished the following:

- For patients with higher HbA1c, often reported as being noncompliant, provided education that fosters medication compliance.
- Provided bilingual education to address poor reading and language skills.
- Provided information on CVD risk factors and aspirin use.
- Discussed the importance of preventive health and encourage flu vaccination.
- Discussed comorbid conditions, such as depression.
- To reduce the number no-shows (documented in 27% of patients), offered fewer

Classes, and complete the program before the summer, as no-shows are more prevalent in summer.

- DSME should help reduce the number of patients seen in the emergency department.
- Should reduce the number of patients referred for specialty care.

Diabetes education has traditionally been provided by nurses and dietitians and evaluation has been limited to those individuals. The DSME program was provided by a bilingual doctoral nurse practitioner (DNP) student/certified diabetes educator (CDE).

Methods

Context

The adult diabetic patients who participated in this DSME program intervention had little to no DSME and their HbA1c levels ranged from 5.6 to 10.2; 70% of patients were below the ADA's recommended HbA1c 7.0 target and 30% were above the ADA's target. Many had difficulty in maintaining a healthy body weight, engaging in regular physical activity, and recognizing changes in their blood glucose levels. Some patients had comorbidities, such as smoking and CVD or another illness. All patients in the program were Hispanic/Latino, and English was their second language.

The nurse who provided the DSME in this project was a DNP learner, had additional diabetes training as a CDE, and had experience with a prior DSME program. Being bilingual in English and Spanish was especially helpful in communicating effectively with the project participants. As an employee of the adult free clinic where the intervention took place, the nurse leader was able to use adult free clinic's facility and resources at no charge and was able to provide the program at no charge to the participants. The clinic provided the foundation for the

intervention and was a key stakeholder in its development and implementation. Having had access to the results of another DSME intervention at another of the adult free clinic's locations allowed the nurse leader to adjust the intervention (e.g., shortening the duration of the program and having the classes on weekends). While the intervention still provided basic diabetes education, it included more hands-on activities to engage participants. These included a "field trip" to a local grocery store, cooking demonstrations, and a family lunch. The success of the intervention was greatly influenced by the effort made by the nurse leader to enhance patient adherence and self-care skills.

Intervention(s)

The goal of this program was to provide Hispanic/Latinos with more effective DSME to decrease HbA1c levels and reduce diabetes-related complications. The project involved developing a DSME program that was culturally enhanced for Hispanics/Latinos. It required the commitment from the staff of the adult free clinic in providing data from electronic medical records and a suitable space at the facility for the class presentations to be held. The adult free clinic's administrative staff also assisted in creating a database for archiving and interpreting results. The intervention relied on the integration of a community outpatient health setting and alignment of policies and programs.

A DNP student/CDE implemented the program. The DSME program description of purpose, priorities, policies, and goals was communicated to patients in English and in Spanish through visual aids and printed handouts. The classes were given in the conference room of the adult free clinic, which was designed to be classroom-type setting. Baseline and follow-up clinical measures, including HbA1c, blood pressure (BP), and weight, were evaluated to determine the effectiveness of the program. Pre- and post-tests were administered to determine

patient's knowledge level and lifestyle behaviors before and after the DSME program. The transtheoretical model of change was used to assess patient adoption of behavior changes.

The first stage of the DSME program, was the learning and knowledge skills provided during the 5 weeks of classes, the second stage at the end of the 5 weeks evaluated the changes in behavior (e.g., improvements in diet and increased activity) and clinical improvement (e.g., as measured by HbA1c), and the third stage at 3-month follow-up evaluated the patient's level of commitment to the diabetes management skills and behavioral changes to reduce diabetes complications and improve overall health and quality of life.

Study of the Intervention(s)

In this project, the transtheoretical model was applied by focusing on the readiness of the adult Latino patient with diabetes to change unhealthy behaviors and adopt diabetes self-management behaviors. Patients were taught how to develop a habit of making healthier choices and how to make monitoring blood glucose habitual, like washing hands before eating. As stated above in the intervention section, the three stages of change were: (a) the learning and knowledge skills provided during the 5 weeks of classes, (b) evaluation of the changes in behavior (e.g., improvements in diet and increased activity) and clinical improvement (e.g., as measured by HbA1c) at the end of the 5 weeks, and (c) evaluation at 3-month follow-up to determine the patient's level of commitment to the diabetes management skills and behavioral changes.

Measures

In accordance with AADE guidelines for outcomes measurement, the DSME program evaluated the following outcomes: behavior change, learning, clinical improvement, and improved health status. Clinical improvement was determined by the change in HbA1c level, BP,

and weight measured at baseline and at the end of 5 weeks. A baseline of HbA1c, weight, and BP findings were obtained from the patients' medical chart. The patients were weighed and BP was taken at the end of the 5-week program. The effectiveness of the DSME program was analyzed by comparing patients' HbA1c measurements at baseline with their HbA1c measurements obtained at the end of the project at 3 months. The patients in the DSME program were asked to complete the revised Diabetes Knowledge Test and the Diabetes Empowerment Scale-Short Form (DES-SF), translated into Spanish, at the start of the program and on the last day of class on the fifth week.

The revised Diabetes Knowledge Test is a simplified true and false scale-based survey used to assess general knowledge of diabetes and diabetes self-care (Fitzgerald, Funnell, Anderson, Nwankwo, Stansfield, & Platt, 2016). It has been shown to be a reliable and valid measure. Cronbach's coefficient α demonstrated reliability for both parts of the test: .77 for the general test and .84 for the insulin subscale (Fitzgerald et al., 2106). In the DSME project, this test was used to determine a patient's current level of understanding of diabetes and how to manage it and current diet, activity level, and use of medications.

The DES-SF consists of a short 8-item questionnaire and is considered a valid and reliable measure of overall diabetes-related psychosocial self-efficacy (Anderson, Fitzgerald, Gruppen, Funnell, & Oh, 2003). The Michigan Diabetes Research Center administered the DES-SF to 229 subjects in a study where the reliability of the DES-SF data and the content of validity of the DES-SF was supported by the fact that both DES-SF scores and HbA1c levels changed in a positive direction after the 229 subjects completed a six-week problem-based patient education program (Anderson et al., 2003). Cronbach's coefficient α was used to calculate reliability, which was determined to be .84. Patient group differences were examined to determine validity. The

researchers hypothesized that test scores would be higher for patients with type 1 diabetes, for patients with more education, and for patients who had received diabetes education. The hypothesis turned out to be correct; patients who received diabetes education scored higher than patients who did not. In the DSME project, this test was used to assess changes in behavior immediately after receiving the DSME. The behavior areas discussed during the 5 weeks of classes included monitoring of diabetes symptoms, healthy coping strategies, reducing risks, and problem solving. The DES-SF post-test also assessed the patient's level of change, whether their plan or goals were achieved, whether they asked for support, supported oneself, coped with emotion, motivated oneself, and made diabetes care choices appropriate for one's priorities and circumstances.

Evaluation of DSME is a critical part of any DSME program. An evaluation survey was given to the participants on the last day of class to evaluate the instructor and classes at the end of the DSME program. It encourages foresight and accountability on the part of the CDE. Having an evaluation survey in place enhances the chances of a DSME program's success. The results can be used to guide future diabetes education programs and can be shared with stakeholders and investors to show the value of the DSME program.

Analysis

The pre- and post-test results from the beginning of the DSME program were compared with those obtained at the end of the first 5 weeks. The HbA1c levels and weight and BP measurements obtained at the beginning and end of the program were also analyzed. The results of the patient survey on the quality of the DSME program and CDE instructor were evaluated by the DNP student/CDE and the advisory board to determine recommendations for improvement.

This intervention was based on an intervention conducted at another adult free clinic in Connecticut. That program was successful in that it provided bilingual diabetes education with the collaboration of a CDE and registered dietician but its drawback was the 8-week length of the program, which was longer than patients were willing to commit due to family and work commitments. This intervention was different from that program in that it provided a more concise focus to help improve retention rates. The DSME program did not interfere with the normal functions of the adult free clinic and complied with Health Insurance Portability and Accountability Act regulations.

Ethical Considerations

There were no ethical considerations for this project. Capella University's Institutional Review Board reviewed the project parameters and determined that no oversight was needed.

Results

An adult free clinic provided a list of 80 patients who had diabetes via their electronic medical record. After telephone interviews with all 80 patients, 20 said they were interested in attending a DSME program, and 10 patients completed the 5-week program. The 10 patients were comprised of six males and four females ranging in age from 26 to 77 years. There were several participants who were not patients but who attended the classes: two middle age children, three spouses in their early 50s, and a 102-year-old mother in law who never missed a class.

Pre- and post-test results

All 10 patients in the DSME program completed both the revised Diabetes Knowledge Test and the DES-SF pre- and post-tests. The revised Diabetes Knowledge Test consisted of 20 questions, two of which were not scored, for a total of 18 questions. For the revised Diabetes Knowledge Test, the overall pre-test score was 8.1 (about 8 of 18 questions answered correctly),

and the overall mean pre-test score was 45%. At the end of the 5 weeks, the patients answered about 13.5 of 18 questions correct on the post-test, with an overall mean score of 75%. The overall score change was 5.4 (30% change), a 100% increase from the start of the program.

For the DES-SF, the overall pre-test score was 35.5, and the overall mean pre-test score was 4.44. At the end of the program, the overall post-test score was 36.5, with an overall mean post-test score of 4.56, overall score changes of 1.0, and mean change of 0.13. The results showed a 70% increase, 20% no change, and 10% decrease from the beginning of the program.

Clinical findings

Average HbA1c level decreased slightly from 6.89 at baseline to 6.64 at the end of 3 months. This equated to a .25 difference between HbA1c levels at baseline and at 12 weeks. In the post results at 12 weeks, five patients had lower HbA1c, four patients had higher HbA1c, and one patient had no change in HbA1c. Over the 5 weeks, average weight decreased from 179.1 lb to 176.9 lb; all patients except one maintained or lost weight, for an average 2.2-lb weight loss. BP readings at 5 weeks had decreased in 70% of patients.

On the evaluation survey handed out on the last day of class at the end of the 5 weeks, all patients rated the program five out of five (five being the most satisfactory) for every question. One patient thought the class could have been held at a more convenient time. Overall, they enjoyed the classes and wanted to continue to meet as a group. They all wrote in Spanish that they learned to help themselves and their family and now know what to eat.

Discussion

Summary

At the beginning of this intervention, the anticipated outcomes were for patients to achieve a $\geq 1\%$ reduction in HbA1c, increased knowledge of diabetes, adoption of healthy

lifestyle behaviors, and improved quality of life. At the end of the 5-weeks, patients were enthusiastic about continuing to practice what they learned by applying their new knowledge and skills in their daily lives. The improvements in weight and BP measurements at the 5-week mark were unexpected benefits and demonstrated the patients' adoption of the lifestyle modifications they learned in class.

At the end of the 3-month project, all anticipated outcomes were achieved with a smaller reduction in HbA1c than expected—a reflection of the fact that 70% of patients were below the 7.0% ADA target at baseline. Even with the small sample, improvements in HbA1c were noted in two of the three patients with high HbA1c levels. Patients reported increased levels of physical activity and being better able to manage their diabetes. Follow-up physical findings of patients also showed a decrease in BP and weight after the DSME program.

The incorporation of bicultural and bilingual aspects in the program helped the patients relate the information to their daily lives and having the classes on weekends when people were not working or dealing with family obligations helped maintain attendance. Although there were only 10 patients, 13 to 14 people attended the class each week. These included a feisty mother in law who was 102 years old, two husbands, one wife, a daughter, and a son. Being able to bring their close family members who are helping them improve their health was important for participants. Ironically, an entire family attended one class, including the husband, mother-in-law, and two middle-school aged children. Both the adults and children learned about how to eat healthier. At each class, they ate foods they never tried before and liked them. Foods provided to patients included no-fat Greek yogurt with fresh fruit and low-carb mini ice cream cones. The class discussed what foods to choose at school and home. These included healthy desserts like ice cream cones reduced in fat.

Using lecture, PowerPoint, videos, and weekly food demonstration with a video was an ideal format. Each week focused on a different food demo where the participants prepared and made the meals together as a group. Every type of meal was addressed: breakfast, lunch, dinner, and potluck supper ideas when getting together for special gatherings. Healthy desserts like fruits salads, ice cream, popsicles, chips and dips (guacamole, salsa, no added salt nachos) were provided at every class. The participants' spouses who attended the classes cooked together and had a better understanding of what foods are healthier and higher in fiber. The participants shared what they learned in the classes with their family members.

Total time spent on this project by the diabetes educator was about 150 hours. Most of the time was spent in recruiting patients and in designing the curriculum for each of the 5 classes (each class was 1.5 to 2 hours long), equating to about 100 hours. Only a few of those hours were spent on coordinating the project with the adult free clinic's program director and program sponsor. Recruitment, which consisted of telephone interviews with each of the 80 patients identified as good candidates for DSME, took about 10 hours. Analysis of the results took about 20 hours. Follow-up and evaluation took about 20 hours.

Interpretation

The weight and BP data can answer some of the questions on the pre- and post-test. The patients came to the DSME program with misconceptions, and cultural awareness was a big deal. When asked about diet and weight control, patients' responses pointed to a lack of understanding of their disease and how to manage it. One woman said, "my husband does not like me skinny," and "I will look sickly if I lose weight" (although clinically overweight). Other patients said, "I have no time to eat breakfast, it's too expensive to buy foods that are good for you," and "I don't have any choices in what I can eat or have the time to prepare meals." All the patients

complained of having no time to exercise or cook healthy meals. Other misconceptions addressed during the 5-week class involved diabetes medications and included the following:

- “The medications make me feel sick so I stop taking them at times.”
- “I heard if I take insulin, it would cause me to be blind.”
- “The medications are going to damage my liver so I sometimes do not take them when I feel good.”
- “I only eat at night when I get home because I know I have to take my medications with food, I don’t take my medications sometimes because I don’t eat.”
- “I have to make two separate meals one for me because of my diabetes and one for my family... this is too much work, I get hungry just eating salads and vegetables.”

After the 5-week class, participants understood how and why to take their medications, the importance of daily exercise, and what foods to buy and how to prepare healthy meals. The participants commented that they enjoyed making food with their family, had more energy, were less tired, happier, and grateful for all they learned in the classes. They wished to continue to lose weight and eat right.

This intervention compliments the literature on Hispanic/Latinos and diabetes self-management showing that DSME in an outpatient community-based health setting improves diabetes outcomes and decreases diabetes complications. In the community outpatient health setting, one can develop a standardized diabetes case management department aimed at educating and working with patients at all levels and supervising registered nurses in the education and monitoring of these patients. This would include a medical provider (MD or APRN), registered nurse, and CDE. Patients will benefit from well versed professionals who use evidence-based practice. A bilingual multidisciplinary case management department exclusively

for diabetics in a community health setting will reduce diabetes complications. This multidisciplinary approach will promote a positive outcome for diabetic patients.

For a DSME intervention to be successful, continued support from health professionals is necessary. Long-term behavior change is unlikely to be sustained without the involvement of health professionals (Powers et al., 2015). Providers have an important role in promoting and supporting healthier behavior. The most effective way of changing behavior is for providers to collaborate with patients (Powers et al., 2015). A patient-centered approach, in which patients' motivation is assessed, can help in tailoring interventions. Providers who offer ongoing DSME can help their patients overcome barriers and cope with increasing demands to facilitate changes during treatment and life transitions (Powers et al., 2015).

Diabetes education provided by community health workers has the potential to reduce costs related to diabetes complications (Prezio, Pagán, Shuval, & Culica, 2014). The costs of this project were minimal. The nurse leader providing the DSME paid for and donated the groceries used in the classes; this amounted to about \$45 per week.

Limitations

Although the intervention was small, with 10 patients total, it can be used for other populations. For example, patient instructions would include pictures for instructions rather than all words for participants who can't read English. This would work for other non-native patient populations as well. The intervention can be adapted in other departments outside of diabetes care, for example, continuity chronic care appointments because patients are educated on the prevention of diabetes. The entire adult free clinic organization could use the intervention as a guide for future self-management education classes for prediabetes patients. The bilingual DSME program can be utilized as an educational and training resource for staff and volunteers

for all patients in all the other free clinic locations in Connecticut and the information can disseminate to adult free clinics nationally. On a national level, outpatient community healthcare centers can adopt the same diabetes self-management project for all patients with diabetes.

In DSME programs held at other free clinics, patient attendance and completion rates had been limitations. To minimize the risk of low attendance and lack of completion, this program was reduced from 8 weeks, as done in previous DSME programs at adult free clinics, to 5 weeks. Classes were given on weekends to avoid conflicts with work and family obligations during the week.

To address any limiting factors specific to Hispanic/Latino population, it was important to remove any language or cultural barriers by making the program bicultural and bilingual. This helped patients relate the information to their own lives and make positive behavior changes.

Conclusions

DSME in the outpatient community-based health setting improves outcomes and diabetes management. Having a bilingual multidisciplinary case management team in the community health center helps overcome the language barrier and increases the learning benefit for Hispanic patients with diabetes. In creating an environment where these patients receive comprehensive health care services, the goal of improving health outcomes and reducing diabetes complications can be achieved.

Certified diabetes educators are instrumental in identifying problems with current DSME programs, and can participate in the implementation, development, and teaching of the DSME program classes (Partnership for Prevention, 2009). However, effective diabetes management requires more than just a skilled CDE and health care provider. Patients with diabetes need to be motivated to self-manage their disease and adhere to diabetes management recommendations,

and they need to make positive changes to their behavior (Hill et al., 2008). Use of the transtheoretical model can help clinicians overcome the many barriers to successful diabetes management and motivate patients to make the necessary behavior changes (Hill et al., 2008). Clinicians who understand the process of behavior change and can apply the stages of change to their strategies for managing diabetes can foster behavior change in their patients (Hill et al., 2008). For lasting change to occur, health care providers and patients need to be committed to ongoing diabetes management.

This project demonstrates the leadership skills of developing and implementing a bilingual DSME program cultural sensitive to the Hispanic/Latino patients in a multidisciplinary evidence based approach by collaborating with experts in the diabetes field. According to Gratton and Erickson (2007), good leaders collaborate with experts—knowing who the experts are in the field and working together supportively to achieve a successful outcome. Burritt (2005) found that skilled nurse leaders are proactive, able to adapt to the ever-changing healthcare system and strengthen the nursing field. Such leadership skills are required to create and manage quality improvement programs like the DSME program for Hispanic/Latinos in the community.

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