


Improving Diabetes Education in Mexican American Older Adults

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Abstract

Lack of culturally sensitive, age-specific diabetes education in Mexican American older aged people may contribute to deficits in diabetes knowledge, self-management, and glycemic control. This quality improvement initiative applied evidence-based, culturally competent, age-specific education to improve health outcomes. A one-group, pretest/posttest design guided this project in a primary care community clinic. Mexican American adults >60 years, with type 2 diabetes mellitus (T2DM; $N = 12$) received 3 months of biweekly innovative classes including: healthy Mexican foods; family involvement; Spanish interpreter using simultaneous earphone technology; and interactive, bilingual, large-print materials. Paired sample t tests compared diabetes knowledge, self-management, and A1C levels. There was a significant improvement in preeducation and posteducation outcomes: knowledge, $t(11) = -7.969, p = .000; d = 2.32$, self-management, $t(11) = -7.930, p = .000; d = 2.43$, and A1C levels, $t(11) = 6.434, p = .000; d = 0.78$. Culturally competent, language-friendly innovation, age-specific T2DM education can positively impact knowledge, self-management behaviors, and glycemic values in older aged Mexican American people.

Keywords

T2DM, older aged Mexican American, self-management, glycemic control, culturally sensitive, age-specific

Diabetes is the seventh leading cause of death in the United States (American Diabetes Association [ADA], 2017), and the leading cause of death in older Hispanics in the United States (Heron, 2019). Approximately 25% of Americans 60 years and older have diabetes (ADA, 2020b). Type 2 diabetes mellitus (T2DM) incidence rates in older aged Hispanics have almost doubled in the past two decades and are two times higher for this group relative to older non-Hispanic White counterparts (Centers for Disease Control and Prevention [CDC], 2018 & Mier et al., 2017). Older aged adults have cognitive and physical changes which can impair their ability to comprehend diabetes education (DE). Many older adults are more comfortable learning in the native language of their culture and have deeply rooted beliefs which may affect diet and exercise behavior, and require education tailored to their needs (Prins et al., 2016).

The population described in the project is Americans of full or partial Mexican descent living in the state of Texas. Lack of culturally sensitive, age-specific DE for older aged Mexican American populations contributes to poor disease management and outcomes such as neuropathy, nephropathy, vision loss, and heart disease (CDC, 2017; Hu et al., 2016; Mier et al., 2017). Across age groups, diabetes complications are higher in Hispanic populations, affecting more than 33% of Mexican Americans and Black Americans compared with

26% of non-Hispanic White Americans (CDC, 2019). DE for Mexican American groups most likely to be effective when sensitive to cultural norms and mindful of age differences to promote adherence to lifestyle modification and treatment plans (Brown et al., 2002; Cruz et al., 2013; Hu et al., 2016; Peña-Purcell & Boggess, 2014). Translation or interpretation of a language is a cultural activity, influenced by many sociocultural factors. The concept of simultaneous language interpretation is fundamentally a cross-cultural communication domain. From the meaning of culture, the influence of cultural factors on the interpreter and the process of translation is crucial, especially in health care. With deepening understanding of the context, people become more aware of the vital role of meaning of the information delivered (Allen et al., 2020).

The purpose of the project was to use culturally sensitive, age-specific interventions with Spanish interpreters using simultaneous earphone technology in a T2DM management education program to increase diabetes knowledge, improve

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self-management behaviors, and improve glycemic control over a 3-month period among older aged Mexican Americans.

Applying concepts of cultural competence including interpretive services, cultural awareness training, skills, knowledge, use of community health workers (CHWs), family involvement in decision making, and incorporation of specific values and attitudes are essential in health promotion (U.S. Department of Health and Human Services Office of Minority Health, 2018). T2DM education for Mexican Americans is ideally delivered through programs encompassing culturally sensitive and age-specific methods (Brown et al., 2002; Cruz et al., 2013; Mier et al., 2017).

Cultural and language differences between patients and health care providers (HCP) may create feelings of distrust, fear, anxiety, and lack of respect. These negative emotions can create barriers causing patients to be less adherent to lifestyle modifications and treatment plans (Alibeji & Stewart, 2016). A gap in cultural competence in practice may present a significant barrier to effective and adequate education for older Mexican American persons with T2DM, resulting in poor management outcomes and increased disparities (American Association of Diabetes Educators [AADE], 2015; "Cultural competency the key," 2017). The way an individual learns depends on their support network and prior life experiences, as well as elements shaped by culture (Alizadeh & Chavan, 2016).

The Mexican population is rapidly growing in the United States (Latin American Association, 2020). Mexican society is categorized by extremes of poverty and wealth, with a limited middle class wedged between an elite group of investors and landowners and multitudes of urban and rural poor (Cline, 2020; Zimmerman, 2017). Economic inequality, significantly lower wages, rural poverty, and better opportunities also play a role in drawing Mexicans to migrate to the United States. About 92.7% of the Mexican population speak Spanish (Central Intelligence Agency, 2020). Mexican culture revolves around the concept of family and inclusiveness as well as religious values Mexican cuisine varies widely between regions (Cline, 2020; Zimmerman, 2017). It is prudent to assess individual needs, including literacy and culture, to determine modalities that will enhance learning in older adults.

Review of the Literature

Several intervention studies show culturally sensitive and age-targeted methods improve behavioral and physiological patient outcomes (Brown et al., 2002; Cruz et al., 2013; Hu et al., 2016; Peña-Purcell & Boggess, 2014). Brown et al. (2002) conducted a study of older aged Mexican Americans with T2DM ($n = 256$) in Starr County, Texas. They found a culturally competent diabetes self-management intervention significantly improved knowledge ($r = .88$) and metabolic status, demonstrated by a treatment group mean glycosylated hemoglobin (A1C) 1.4% below the mean of the control

group at 6 months. A similar study provided culturally sensitive T2DM education for 10 weeks to a sample of 70 Hispanic older adults (Castillo et al., 2010). They found a 26% increase in diabetes knowledge score: pretest: 68.8; posttest: 86.4 ($p < .000$), while Salto et al. (2011) conducted a 3-month culturally tailored DE intervention for 46 older aged Hispanic adults finding a significant reduction in dietary fat intake ($p = .045$) and dietary cholesterol ($p = .033$) postintervention. A comparable quasi-experimental study found significant behavioral improvements: daily self-foot inspection increased from 49% to 71% ($p < .001$) and daily exercise increased from 50% at baseline to 87% at follow-up ($p < .001$; Rotberg et al., 2016). Two randomized controlled trials in which culturally tailored DE programs were implemented in Hispanic patients with T2DM found significant decreases in A1C values ($p < .001$; García et al., 2015; Prezio et al., 2013). Evidence supports efficacy of culturally competent DE for Mexican American older adults.

Method

Setting and Sample

The setting for this project was a community clinic in suburban central Texas, whose clientele was largely underserved Mexican American patients. This large family practice clinic averaged over 96,000 unique visits per year and employed approximately 80 providers at 22 locations. Prior to this project, the clinic lacked an on-site DE program, requiring patients to travel for this service. The current DE offered was a universal program not specifically tailored to cultural practices or age. The population was predominately low-income and underserved, creating barriers to care and health education. Clinic leadership sought innovative DE change because of high incidence and prevalence of uncontrolled T2DM in primarily the older Mexican American patient population. The Texas A&M University-Corpus Christi Institutional Review Board reviewed this quality improvement project and determined it was not human subjects research.

Participants were Mexican American adults 60 years or older with T2DM ($N = 12$). No exclusions were made based on ethnicity, gender, or comorbidities. Information on citizenship or legal status of the participants was not collected. Participants were recruited over a 4-week period using flyers placed in preapproved designated areas in the clinic, invitations from the project team during clinic visits and phone calls from the CHWs to participants who met criteria. CHWs were trained for 2 hours on recruiting participants including education to be provided, location of classes, duration of each class, number of sessions, and program duration. CHWs encouraged interested participants meeting criteria to attend all sessions, informed them healthy snacks and meals would be provided at every session, and that a raffle would be drawn for a new glucose meter at the end of the program. They also provided the name and contact information of the

project director (PD) to participants, for questions. To provide interrater reliability, CHWs recruited using bilingual scripts. Participants were informed the educational sessions were voluntary, and participation or nonparticipation would not affect their relationship with their primary care providers or the clinic.

Design and Guiding Framework

This project used a 12-week culturally tailored and age-specific DE course with a pretest and posttest to measure improvements in diabetes knowledge and self-management activities. The health promotion model was used as a theoretical framework to guide the project because it underpins unique personal attributes and backgrounds affecting subsequent behavior or action (Polit & Beck, 2018; Potter et al., 2017). In promoting health, especially in a diverse group, cultural competence should be considered by HCPs to approach the group purposefully in an impactful manner. Cultural competency criteria include self-awareness and respect for cultural differences, awareness and acceptance of differences, responsibility for understanding cultural aspects of health and illness, and developing skills for interaction and communication across cultures (Alizadeh & Chavan, 2016).

Project Team

The PD, a nurse practitioner (NP) immigrated to the United States from Nigeria and recognized challenges associated with cross-cultural health literacy. This experience spurred creation of a project framework to bridge knowledge gaps for Mexican American individuals with diabetes. The project team was composed of an endocrinologist, three NPs, two certified Spanish medical interpreters, two medical assistants (MAs), one registered nurse (RN), and two CHWs. The project team members were bilingual in Spanish and English, except for the PD. The PD was responsible for delivering educational sessions. Two other NPs and the PD provided individualized support by answering participant questions while completing questionnaires during sessions. The PD used professional interpreters to ensure accurate translation. Interpreters worked on alternating schedules, with one interpreter present at each session. MAs collected point-of care A1C values before the first class and after the final class and participated in recruitment.

Intervention

DE content was based on the AADE and the ADA standards of care, which are consistent with evidence-based clinical practice guidelines (AADE, 2016; Beck et al., 2019; Powers et al., 2017), and incorporated the following teaching objectives: healthy eating, physical activity, glucose monitoring, medication management, problem solving, complication

and risk reduction, and healthy coping techniques (Beck et al., 2019; Powers et al., 2017). Prior to the intervention, participants had never received any formal DE training outside of the recommendations given during routine clinic visit with primary care. Recruiting was conducted before intervention. Intervention took place over a 3-month period. Classes were conducted in a single series of four sessions every other week. At the beginning of each class, participants and project team identified critical barriers to diabetes self-care behaviors. The following needs were highlighted by the group: motivation, resources for healthy food choices congruent with Mexican diet preferences, knowledge on what is healthy and what is not, consistent ability to attend DE classes, follow-up with primary care providers, awareness of diabetes classes, and knowledge of long-term implications of diabetes. The intervention provided culturally tailored modifications, age-appropriate and evidence-based content. See Tables 1 and 2.

Families of participants were encouraged to attend classes to support participants. Findings from Hu et al. (2016) suggest including family members in educational interventions for older Hispanic adults may provide psychological and emotional support to patients with diabetes. Classes were interactive using simultaneous earphone technology for Spanish-speaking participants; who were provided opportunities to ask questions. Unlike consecutive interpreting, the natural flow of the speaker is not disturbed and allows smooth output for the listeners. The PD taught in English and the interpreter translated to Spanish through earphones worn by all participants who requested Spanish translation, a unique element. This allowed for simultaneous communication to all participants during the session. Open-ended follow-up phone calls were made by the PD and Spanish interpreter in-between DE sessions to discuss progress and challenges from the participants. Participants could call the PD as needed to enhance support and encouragement. The PD and Spanish interpreter made a three-way call to participants who were Spanish speaking only, and the PD made one-on-one calls weekly to those who preferred English.

During all sessions, participants were provided healthy foods to eat, most of which were congruent with Mexican American cultural preference. Food plays a key role in preserving Mexican American heritage. Evidence-based recipes for healthy Mexican American foods including replacing white rice with brown rice, using herbs and spices to boost flavor, and reducing the need for added salt. Participants were taught how to read and interpret food labels, using both Spanish and English, ensuring they used reading glasses if needed (McCurley et al., 2017). Participants were encouraged to incorporate provided recipes into individual meal plans. Participants were taught about types of foods to which they were culturally accustomed and how those foods could affect blood glucose levels. They were also taught the importance of maintaining food portion sizes to manage carbohydrate intake. To supplement local cultural cuisine nutritional

Table 1. Culturally Sensitive Modifications.

1	Families of participants were encouraged to attend the classes to support participants and accentuate cultural-competence in the project. Including family members in educational interventions for the older Hispanic population provides psychological and emotional support to patients with diabetes, help to develop healthy family behaviors, and promote diabetes self-management.
2	Classes were interactive, and participants were provided opportunities to ask questions.
3	Professional certified medical Spanish interpreter provided interpretive services during the education intervention from English to Spanish using simultaneous earphone technology.
4	The PD taught in English and, the interpreter translated to Spanish during the session. Follow-up phone calls were made by the PD and the Spanish interpreter in-between diabetes education sessions to discuss the progress and challenges from the participants.
5	The participants had access to call the PD as needed to enhance support and encouragement. The PD and the Spanish interpreter made a three-way call to the participants that were Spanish speaking only, and the PD made one to one calls to those who spoke English.
6	During all sessions, participants were provided healthy foods to eat, many of which were congruent with the Mexican culture such as tacos, rice, and beans. Recipes on healthy Hispanic foods were provided, and they were taught how to read and interpret food labels, using both Spanish and English, and ensuring they used reading glasses if needed.
7	The participants were taught about the types of foods which they were culturally accustomed to, and how those foods could increase blood glucose levels. They were also taught the importance of controlling food portion sizes throughout the day to control carbohydrate intake.
8	To supplement the Mexican dietary content, participants were provided with a leaflet of culturally familiar foods, organized in different food groups, with recommended serving sizes.
9	Bilingual written materials were used to enhance comprehension. To reinforce bilingual written materials and new skills such as the proper way to check blood glucose, role-play was introduced. Role-play provided the opportunity for hands-on practice and development, and for enhancement of self-efficacy to promote intercultural communication.

Note. PD = project director.

Table 2. Age-Appropriate Modifications.

1	Age-specific diabetes education interventions addressed medication reconciliation, health care literacy, diet, and physical activity in the older aged population.
2	Handouts related to diabetes education were provided in bolded and enlarged print. Lessons were provided in simple context with the PD talking in a clear tone and at a moderate to slow pace to promote comprehension.
3	Videos and digital visual aids were used and projected on a large screen to promote visibility.
4	The classroom was well lit with comfortable seating, and there was easy wheelchair accessibility.

Note. PD = project director.

content, participants were provided with a leaflet of culturally familiar foods, organized in different food groups with recommended serving sizes (Kollanoor-Samuel et al., 2016; McCurley et al., 2017; Osborn et al., 2010). Leaflets were obtained from the AADE and ADA websites in English and Spanish (AADE, 2018; ADA, 2020a). Information was provided regarding culturally appealing healthy foods on sale in the local grocery store, providing support and resources on healthy options available at affordable prices. Bilingual written materials from AADE were used to enhance comprehension (AADE, 2018).

Age-specific DE interventions addressed medication reconciliation, health care literacy, healthy eating, and physical activity in the older aged population (Omar & San, 2014; Tan et al., 2015). Participants with visual impairment were provided handouts related to DE in bolded and enlarged print in English and Spanish lessons were provided in simple context with the PD talking in a clear tone and at a moderate pace to promote comprehension and translation (Dirette & Anderson,

2016). Videos and digital visual aids, provided in English and Spanish, were projected on a large screen to promote visibility. The interpreter demonstrated use of headset for simultaneous interpretation, which the participants found easy to use. The classroom was well lit with comfortable seating, and there was easy wheelchair accessibility. To reinforce bilingual written materials and new skills such as the proper way to check blood glucose. Role-play, offered in both English and Spanish provided opportunity for hands-on practice and enhancement of self-efficacy (AADE, 2018).

Given the staggering prevalence of T2DM in the Mexican American population, relevant community and national statistics were provided to participants and subsequent interactive class discussions were encouraged. Discussion on misconceptions or myths about T2DM were also discussed as a group (Cruz et al., 2013; Osborn et al., 2010; Peña-Purcell & Boggess, 2014). To enhance information on physical activity, participants were educated on how simple increases in physical activity can reduce blood glucose levels

Table 3. Risks and Resources.

Risk factors considered	Actions taken to mitigate risks
Lack of consistency in diabetes session attendance by participants	Healthy snacks and meals were provided during each session. Glucose meter provided to the winner of a raffle, courtesy of the clinic, as a budgeted expense, to incentivize participants to complete the education intervention sessions.
Lack of adequate transportation for participants to and from the project site	Family involvement in transportation. Participants inquiry about other methods of transportation assistance from the social worker at the clinic.
Lack of sufficient project team members to conduct the intervention	Back-up project team members were available in case a team member was not able to perform his or her role due to unforeseen reasons; and finally.
Lack of effective communication from nonbilingual project team members.	Certified Spanish-speaking interpreters was present during all education sessions.

and risk of diabetes-related complications. All participants verbally committed to 30 minutes exercise, mostly walking 5 days a week. Participants kept an exercise log and shared with the team during class sessions.

Measurement Tools

Tools used to measure outcomes included the Diabetes Knowledge Questionnaire–24 (DKQ-24) (Garcia et al., 2001) and the Diabetes Self-Management Questionnaire (DSMQ; Schmitt et al., 2013). The DKQ-24 is a 24-item questionnaire measuring diabetes knowledge, which is available in both English and Spanish and is worded in easily understandable terms. Examples of some of the questions are “Eating too much sugar is a cause of diabetes” and “Diabetes can be cured.” The responses are available in *Yes*, *No*, and *I don’t know* format. The DKQ-24 has a reliability coefficient of 0.78 (Schmitt et al., 2013). The DSMQ is a 16-item questionnaire designed to assess self-care activities associated with glyce-mic control (Schmitt et al., 2013). The questionnaire was designed to measure four subscales: dietary control, physical activity, health care use, and glucose management. It has demonstrated good internal consistency (Cronbach’s alpha 0.84; Schmitt et al., 2013). Like the DKQ-24, the DSMQ is simple and easy to administer to English- and Spanish-speaking participants. The Alere Afinion A1C machine was used as a point-of-care testing device, which provided immediate and reliable test results needed to assess A1C values (Afinion HbA1C, n.d.; Alere, 2017). The sensitivity across A1C devices was similar, but specificity varied. The Alere Afinion had the highest specificity at the diagnostic A1C cut-off value of 6.5% (48 mmol/mol; Foerster & Severn, 2017).

Risks and Resources

Risk factors such as lack of consistency in attendance, transportation issues, and staffing concerns were considered prior to the project as possible barriers to the success of the project

intervention. The team designed actions to mitigate the considered risks. See Table 3.

Data Collection

Before education commenced in the first session, questionnaires (DKQ-24 and DSMQ) were given to participants to complete as part of the preintervention assessment. Questionnaires were read aloud to the group in English by the PD and in Spanish by the certified Spanish interpreter to ensure understanding. Bilingual scripts were used for all education components.

The bilingual MA obtained point-of-care A1C values on participants preeducation. On the last day of the intervention, the same questionnaires were provided for the participants to complete, and A1C levels were assessed again for posteducation results.

Evaluation

The Rosswurm and Larrabee (1999) evidence-based practice model was used as the evaluation framework for this project, incorporating elements of evidence-based practice, research utilization, and enforced change theory. The outcome of the evaluation process led the team to determine recommendations for DE for Mexican American older aged adults were appropriate. Figure 1 depicts the six elements used for planning and implementation.

Data Analysis

SPSS, version 25.0 was used to analyze the data. Descriptive statistics were used to describe the demographic data. The data were further analyzed using paired *t* tests, comparing preintervention and postintervention knowledge levels, diabetes self-care behaviors, and A1C levels. Significance was established at $p < .05$. A Cohen’s *d* was calculated to determine effect size.

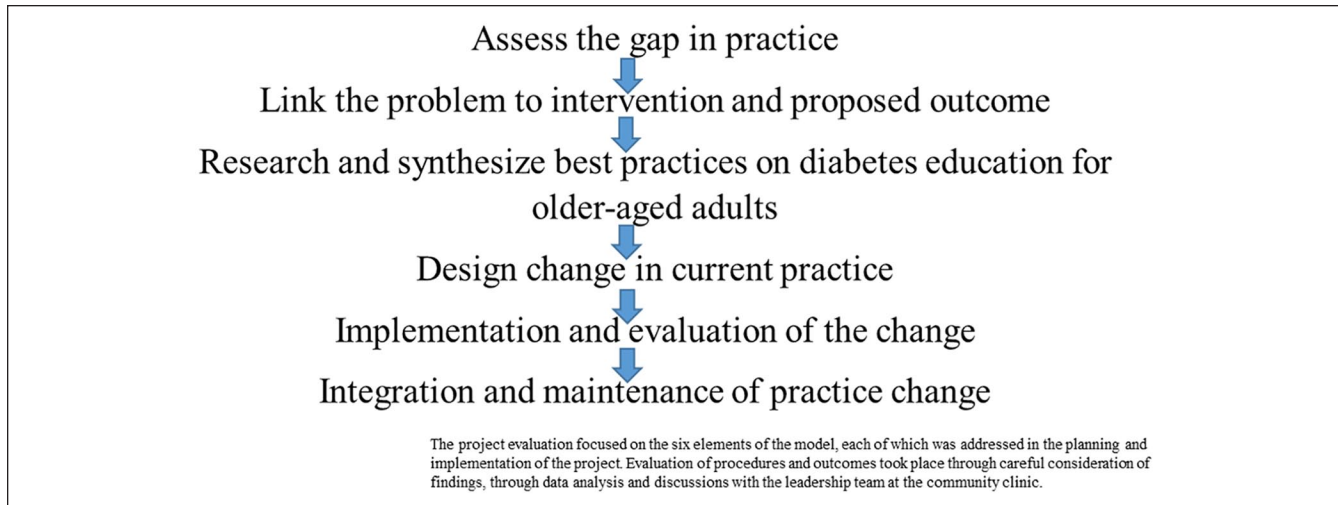


Figure 1. Six elements of the project evaluation.

Results

Our experience at this clinic involved 45 patients who met criteria for inclusion and were notified via phone calls or in person during clinic visits. Twenty-five patients showed interest in attending the classes and 13 committed to take the classes. The participants reported they had never had previous DE. A total of 13 participants were recruited from a convenience sample, and six family members from five families also attended sessions. Over 3 months, 12 participants who were 60 years and older completed biweekly sessions of DE, all surveys in both English and Spanish, and pre- and post-A1C point-of-care testing. One participant dropped out due to elective surgery. See Demographics, Table 4.

Diabetes Knowledge, Self-management Behaviors, and Glycemic Control

Over the 3-month period, culturally tailored, age-specific materials and techniques, and use of Spanish interpreters with simultaneous earphone technology included in a T2DM management education program did increase diabetes knowledge, improve self-management behaviors, and improve glycemic control. Statistical comparisons using paired *t* tests measured improvement in knowledge and management behaviors following the course. There was a significant difference in preeducation and posteducation outcomes in knowledge, self-management, and A1C as shown in Table 5. The effect sizes for knowledge ($d = 2.32$), self-management behavior ($d = 2.43$), and A1C ($d = 0.78$), closely approached or exceeded Cohen's convention for a large effect ($d = 0.80$; Polit & Beck, 2018; see Figures 2, 3, and 4.).

Table 4. Participant Demographics ($N = 12$).

	<i>M (SD) or %</i>
Mean age	68.3 (6.53)
Gender	
Male	17
Female	83
Employment status	
Employed	25
Unemployed/retired	75
Preferred language	
Spanish	75
English	25
Insulin use	
Yes	17
No	83

Discussion

Diabetes self-management behaviors are categorized into seven areas: healthy eating, being active, monitoring, medication adherence, problem solving, risk reduction, and healthy coping (AADE, 2016). This project provided DE focusing on these seven categories with emphasis on an age-appropriate and culturally competent approach. Our experience yielded significant and relatively large increases in diabetes knowledge, self-management behaviors, and a decrease in A1C in our small sample. Though not measured, weight loss was an outcome reported by some family members, who attributed this to education received in the DE program. Patients who receive healthy eating counseling and adhere to DE management recommendations are likely to experience weight loss (Azar et al., 2015; Wilding, 2014).

Table 5. Preintervention and Postintervention Outcome Comparisons (N = 12).

	Range	M (SD)	t	p	Cohen's d
Preintervention AIC	5.9-9.5	8.14 (1.03)	6.43	<.001	0.78
Postintervention AIC	5.4-8.6	7.36 (0.91)			
Total score on Pre-DKQ	10-20	14.67 (3.23)	-7.97	<.001	2.32
Total score on Post-DKQ	18-24	20.75 (1.82)			
Total score on Pre-DSMQ	15-41	29.42 (7.15)	-7.93	<.001	2.43
Total score on Post-DSMQ	35-48	43.67 (4.21)			

Note. DKQ = Diabetes Knowledge Questionnaire; DSMQ = Diabetes Self-Management Questionnaire.

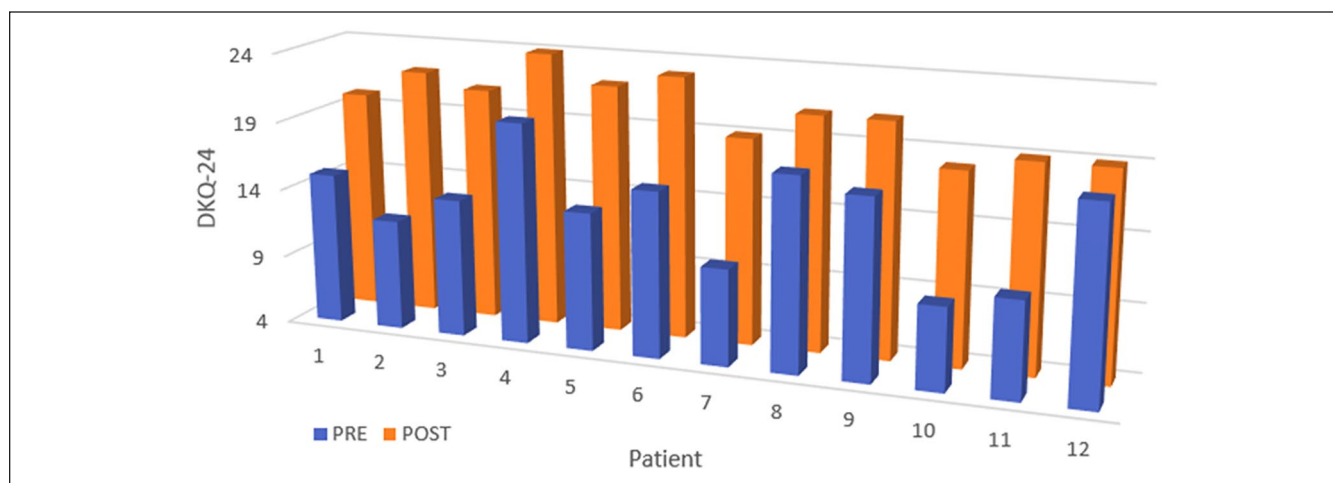


Figure 2. Diabetes knowledge preintervention versus postintervention.

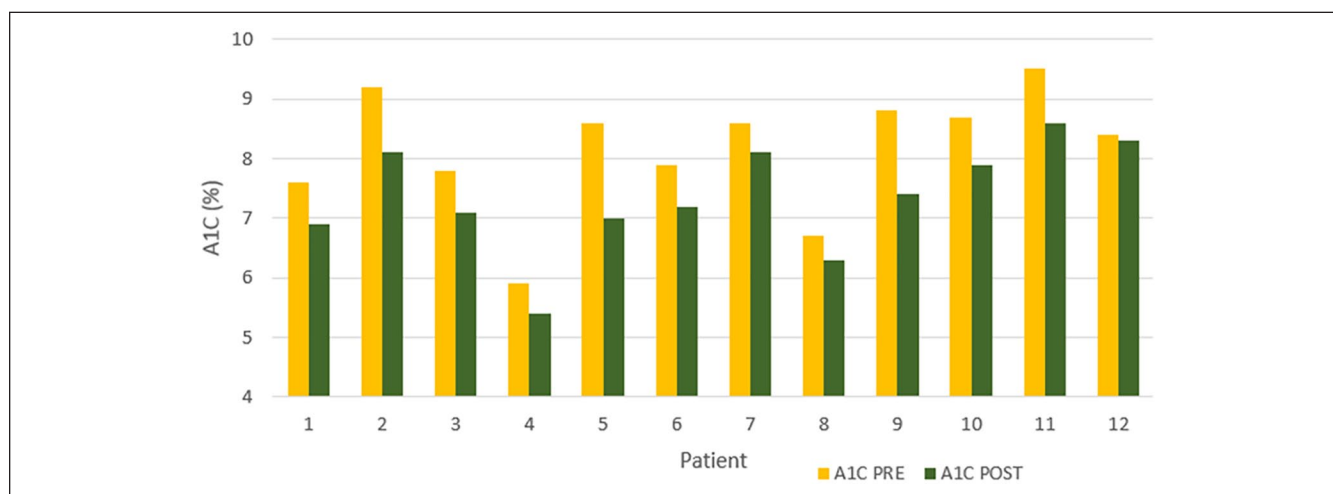


Figure 3. A1C preintervention versus postintervention.

High attrition rates in diabetes self-management classes reflect the reality of community-based interventions serving low-income Spanish-speaking participants (Rotberg et al., 2016). A multidimensionality of factors can influence

consistent participation in a DE program in Mexican American groups including participants' relationship with T2DM, culture, resources, HCPs, and/or their clinic (Testerman & Chase, 2018). This clinic experienced an

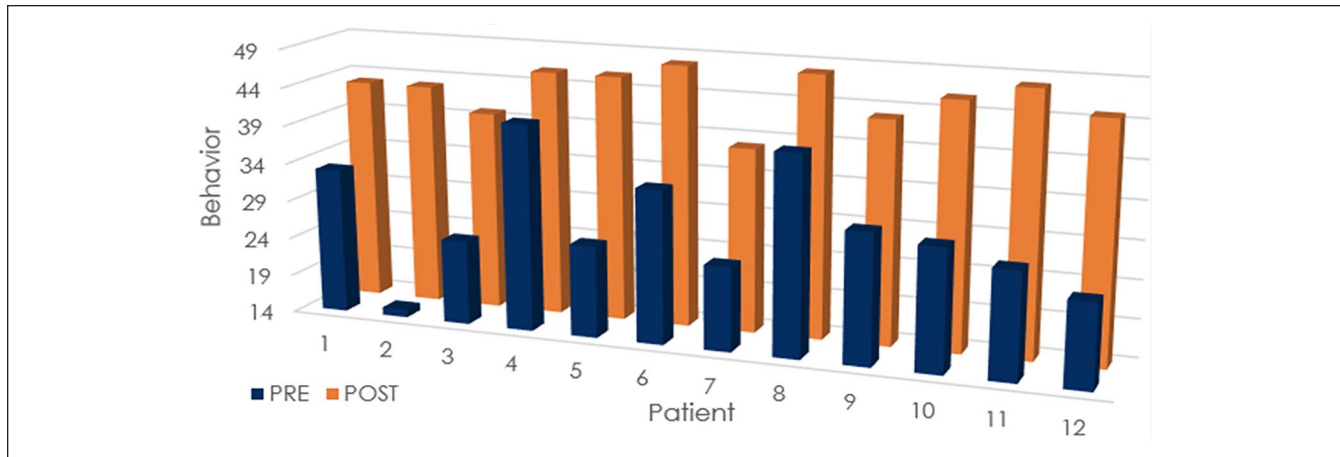


Figure 4. Self-management behavior preintervention versus postintervention.

unusually low attrition rate of 7.7%, reflecting only one participant dropping out. This low attrition rate could be attributed to several benefits of this experience for patients: easy access to the PD for follow-up questions between sessions, the PD's frequent follow-up phone calls to each participant, engaging feedback and questions, interactive education sessions, complimentary, culturally tailored snacks and meals, family involvement, and dedication from the project team. It is recommended to plan ahead and have alternative plans for even small anticipated barriers.

The intervention from this project was feasible and replicable for the clinic because several measures could easily be adopted through small to moderate practice and policy changes. An RN, NP, or physician assistant could lead the team for DE at the community clinic. The clinic could provide modest but healthy, culturally appropriate snacks during sessions with recipes for full meals. Diabetes classes offering food or focusing on economically healthy cooking skills can increase class attendance and improve glycemic control (Byrne et al., 2017). This project provided feasible meal options during classes and produced significant improvement in self-management behavior, A1C, and good class attendance. The clinic could also adopt use of a Spanish–English interpreter. Clinical communication around diabetes can be challenging in contexts of linguistic diversity and culture (Lloyd et al., 2018). Understanding patients' perspectives using interpretive services and addressing cultural barriers to care are important for ensuring effective communication and diabetes control (Njeru et al., 2017). The use of an in-person interpreter may increase patients' involvement in their health care satisfaction and health outcomes (Allen et al., 2020). Studies show DE programs utilizing CHWs, Spanish-speaking providers, bilingual Mexican American moderators or interpreters have positive and impactful community outcomes (Brown et al., 2002; Brown et al., 2018; Kollanoor-Samuel et al., 2016; Njeru et al., 2017).

Incorporating telephone communication and counseling access to providers could be helpful element in future DE programs. In this project, participants were able to call the PD during business hours and receive information and support. A Spanish-speaking nurse or rotate nurses who speak Spanish could take calls for DE-related questions during clinic hours. Strong evidence shows phone intervention or follow-up calls can lead to improvement in self-management behaviors and glycemic control (Archer et al., 2016; Krishna & Boren, 2008; Liang et al., 2011). All culturally and age-tailored educational materials and approaches utilized in the project could be integrated into routine clinic educational practices.

The findings from this project were accomplished by assessing the need for change in practice and applying evidence-based interventions tailored for this population. This experience allowed us to demonstrate improvements for a small number of clinic participants following the practice change. Although the timing of the intervention was 3 months, participants were scheduled to follow-up with their HCP for ongoing care and management guidance. An ongoing educational program applying these techniques has the potential to improve communication, education, understanding, and outcomes for patients working to properly manage their T2DM.

Limitations

This project, as a first step in improving delivery of DE for this clinic population, was limited by a small sample size ($N = 12$); however, there was minimal attrition (7.7%, one person), which is encouraging for future classes. A second limitation was generalization of self-management behaviors. Further data could have been collected on specific behaviors such as physical activity, diet, foot care, skin care, and appointments with HCPs. Another limitation was use of a medically certified interpreter with earphone technology.

This type of interpretive service may not be financially sustainable at the community clinic, which could consider using bilingual nurses or MAs to assist in interpreting during sessions instead. Height and weight measurements were not collected during the intervention phase. This data could have recorded improvements in body mass index, which should be monitored in follow-up visits. Despite these limitations, our understanding of the effects a culturally tailored, age-conscious, DE program can have in this clinic setting were encouraging and support continued implementation of this type of DE in the clinic.

Conclusions

The findings from this project support need for change in DE practice policies for older aged Mexican Americans in this particular clinic setting, culturally competent, language friendly, age-specific approach. These findings, although specific to this setting, should encourage nurses in community or clinic practice settings to advocate for policies supporting DE tailored to the needs of the older aged Mexican American population. More research is needed to determine how age and culturally appropriate DE improves outcomes when compared with standard education methods in the Mexican American elderly population. Improvement in diabetes knowledge, self-management behaviors, and improve glycemic control with emphasis on cultural and age appropriateness can improve patient's health outcomes (Beck et al., 2019).

Escalating importance of the need for age-appropriate and culturally competent DE for older aged Mexican Americans is evident in the growing number of elderly and growth of the diabetes epidemic in this population. In caring for patients with T2DM, interventions facilitating integration of risk factor recognition, diet, exercise, glucose monitoring, and medication adherence need to be developed and tailored to different levels of care, cultures, and age groups.

Declaration of Conflicting Interests

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