

# PROMOTING HEALTH IN THE HISPANIC AMERICAN POPULATION THROUGH A COMMUNITY EDUCATIONAL EXPERIENCE ON DIABETES MELLITUS: A NOVICE RESEARCHER EXPERIENCE

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*The role of nurses is to become a leader in their communities. One way to demonstrate their leadership is to organize prevention programs to improve the quality of life for Hispanic Americans. The prevalence of diabetes mellitus (DM) diagnosed in Hispanic Americans is reported to be 12.1%, compared to 7.4% in non-Hispanic Caucasian Americans. This study was a non-experimental, educational intervention using pre- and post-test design held at a county health department. Following the educational intervention, a paired sample t-test showed overall positive acquisition of knowledge ( $p=0.038$ ). From time 1 to time 2, gains were seen in knowledge about purchasing diabetic foods; importance of weight control; eating a high protein/low carb diet with fiber; impacts on kidneys, eyes, and sexual function; importance of regular check-ups with a healthcare provider; potential for stroke or other complications; and understanding risks for children developing diabetes whose parents are diabetic. Losses were seen in understanding the cause of diabetes, importance of physical activity, food preparation, and specific foods to eat. We recommend a personalized education intervention for Hispanic Americans understanding their own DM risks and modifiable behaviors.*

## **BACKGROUND**

**D**iabetes mellitus (DM) is a prevalent and potentially life-threatening disease, affecting 12.2% of the Hispanic American population in the United States (U.S. Health and Human Services, 2017). These rates of prevalence are of grave concern for the Hispanic American population and health care providers. Complications of diabetes contribute

to impaired eyesight, heart disease, kidney impairment, and even death. “Despite the development of new technologies and self-management tools, less than 30% of persons with diabetes achieve recommended glycemic targets” (Benavides-Vaello, Brown, & Vandermause, 2017, p. 2).

DM is not a single disorder, in fact, it corresponds with a set of autoimmune, genetic, and metabolic disorders that all share the common factor of hyperglycemia (Egan & Dineen, 2019). Forty percent of all adults living in the United States are likely to develop DM Type 2, and Hispanic adults are more than 50% likely to die from this chronic disease compared to non-Hispanics (National Center for Chronic Disease Prevention, 2017; Narayan, Boyle, Thompson, Sorensen, & Williamson, 2003).

Historically, research has focused on Hispanic Americans as a singular population rather than by Hispanic subgroups. Higher rates of DM are seen among Central Americans, Dominicans, Puerto Ricans, and Mexicans (Balfour, Ruiz, Talavera, Allison, & Rodriguez, 2016). Yet recent studies are using within-group Hispanic/Latino designators, in answer to the U.S. government’s call to include more racial diversity in research efforts (Smedley, Stith, & Nelson, 2003). For example, the Hispanic Community Health Study/Study of Latinos organized their research by Hispanic subgroups (Balfour et al., 2016).

The importance of cultural factors needs to be acknowledged, as individuals’ family and friends have cultural associations that can impact DM. For instance, sharing food is an inherently social activity, and Hispanics are more likely to include starchy foods in their diets than non-Hispanic whites. These foods are associated with larger waist circumferences, higher BMI, and increased risks for developing diabetes (Valencia, Oropesa-Gonzalez, Hogue, & Florez, 2014). The relationship between social support and blood sugar stability among U.S. Hispanic/Latino diabetics was considered by Rotberg, Junqueira, Gosdin, Mejia, and Umpierrez (2016). Findings showed patients with low levels of social support had higher A1C (9.8%) measures than those who reported moderate to high levels of support (8.9%) (Rotberg et al., 2016). Hemoglobin A1C measures the average amount of glucose attached to hemoglobin over 3 months. Any Latino patients with DM, especially those with lower levels of family and social support, expressed concern about having social

assistance (Rotberg et al., 2016). This practice implication is that healthcare providers must become informed about relevant cultural factors in order to determine practical strategies to educate patients about DM.

The Model Outpatient Diabetes Education Program explored an effective intervention that provided DM education (Paulozzi, Norman, McMahon & Connell, 1984). In this study, an interdisciplinary team provided prevention education, self-care management, and skills for managing DM over 16 hours. A pre- and post-test were used 3 months before and 3 months after the study. Results demonstrated significant improvement in diabetic control for participants (Paulozzi et al., 1984).

The purpose of this study was to explore community-dwelling Hispanic Americans' understanding of DM and the impact of a DM education intervention on their knowledge gained.

## **MATERIALS AND METHODS**

This study was approved by the Utah Valley University Institutional Review Board. The target population, recruited using snowball sampling, identified as Hispanic American adults who were 18 years old or older. The sample size for this study was driven by the available space at the site of intervention (n=17).

In a 2018 community health survey to local Hispanic Americans, they expressed their major health concern was DM. A DM knowledge survey was created using information from the Diabetes Knowledge Questionnaire (DKQ-24) (Garcia, Kouzekanani, Villagomez, Hanis, & Brown, 2001), the Revised Michigan Diabetes Knowledge Scale True/False Version (Lloyd, 2008), and information from the American Diabetes Association website (2019). The survey was comprised of 20 questions with potential responses of "yes," "no," and "I don't know." It was available in both English and Spanish languages to participants. See Appendix to view the survey.

The intervention was held on a Friday evening at a county health department facility. Upon arrival, participants consented to participate and completed the knowledge survey to evaluate their initial understanding of DM (Time 1). Next, diabetic-friendly foods were offered to participants to sample. The education intervention lasting 60 minutes was presented

in Spanish, provided by an interdisciplinary healthcare team consisting of a medical doctor, dietary health educator, and health department worker. Topics covered were lifestyle changes, portion control, culturally-appropriate diabetic-friendly foods, physical exercise, general diabetes management, and community resources for Hispanic Americans with pre-DM or DM. Immediately following the intervention, participants completed the post-test survey (Time 2). Data was analyzed using Microsoft Excel.

**RESULTS**

Results along with questions included in the survey are shown in Table 1. Pre- and post-tests percentages correct are shown in the table. All participants (n=17) were above the age of 18 and self-identified as members of the Hispanic community. Response categories are presented next.

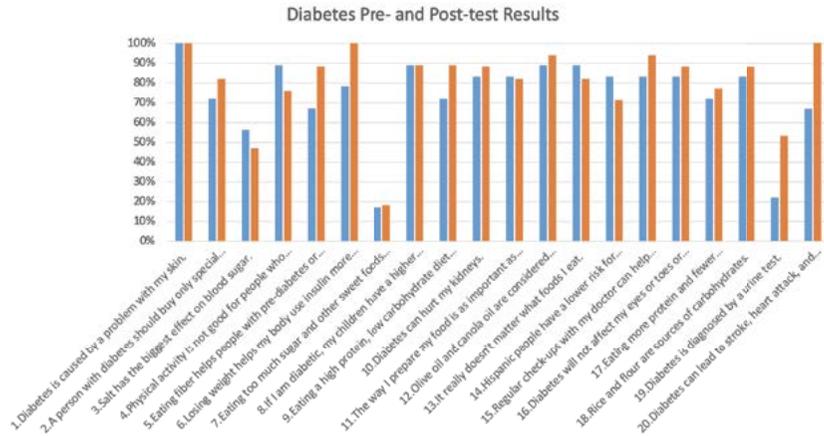


Table 1: Comparison of Results Obtained from Pre- and Post-Tests

*CAUSES OF DM: PHYSIOLOGIC*

Understanding causes of DM showed inconsistent results from pre- to post-testing (Q1, 6, 7). A few participants (3) did not understand that sugar is not the *cause* of diabetes, yet they maintained knowledge (100%) of issues with skin not causing diabetes. The intervention conveyed clear gains about the importance of weight relating to diabetes (T1 = 78% to T2 = 100%).

*CAUSES OF DM: GENETIC/RACIAL*

Knowledge of genetic and racial associations with risks for DM showed some increase in knowledge from pre- to post-testing (Q8, 14). Knowledge remained stable (T1 = 89% to T2 = 89%) about understanding the greater likelihood of passing on DM to their children, however, there was about 12% increase of understanding that Hispanics have a higher risk for DM (T1 = 71% to T2 = 83%).

*SIDE EFFECTS*

Participants increased their knowledge of DM side effects, including kidney damage (T1 = 83% to T2 = 88%), effects on toes, eyes, and heart (T1 = 83% to T2 = 88%), as well as chronic conditions such as stroke, heart attack, and sexual problems (T1 = 67% to T2 = 100%) as demonstrated by comparing the outcome of pre- and post-tests (Q10, 16, 20).

*MEDICAL CARE AND DIAGNOSIS*

Although participants were unsure of how DM was diagnosed (T1 = 22% to T2 = 53%), they realized how helpful a medical provider could be during checkups (T1 = 83% to T2 = 94%). This highlights the importance of the patient-provider relationship for Hispanic Americans who are pre-diabetic or diabetic to manage their disease (Q15, 19).

*PHYSICAL ACTIVITY RELATED TO DM*

Participants lost knowledge about the importance of physical activity for DM prevention and maintenance (T1 = 89% to T2 = 76%), however, participants understood the importance of losing weight to help better manage the body insulin levels (T1 = 78% to T2 = 100%) (Q4, 6).

*CONSIDERATIONS OF FOOD/DIET*

In recognition of the impact of food on DM, nine questions in the survey focused on participants' understanding of aspects of foods. Understanding the importance of fiber showed an increase of knowledge (T1 = 67% to T2 = 82%), however, participants misunderstood salt's impact on blood sugar (T1 = 56% to T2 = 47%). They understood and showed gains about the importance of a high protein with healthy fats (T1 = 72% to T2 = 89%), as well as the importance of decreasing carbohydrate intake (T1 = 72% to T2 = 77%). The majority of participants also understood where carbohydrates are found in certain foods (T1 = 83% to T2 = 88%) (Q2, 3, 5, 9, 11, 12, 13, 17, 18).

## **DISCUSSION**

It is concerning that participants experienced some loss of knowledge during the intervention (Q3, 4, 13, 14). These negative results may have been due to lack of attention during the intervention, unclear explanations by presenters, or misunderstanding the content delivered and should be explored. Future use of the survey with a larger sample size would allow for the survey to be tested for validity and reliability of questions and constructs.

Participants understood side effects related to damage to kidneys, heart, toes, eyes, and brain (Q10, 16, 20). Overall, the pre-test mean ( $M = 73.85$ ) improved at the post-test measure ( $M = 79.7\%$ ). This aligns well with the Model Outpatient Diabetes Education Program (MODEP) that had a similar intervention and showed similar gains from 82.9% to 87.7% on the post-test (Paulozzi et al., 1984). Another study by Rashed, Sabbeth, Younis, Kisa, and Parkash (2016) used a pre- and post-test to measure effectiveness among a group of Palestinian DM Type 2 adults of the community. Their 4-hour seminar discussed risk factors and dietary management and showed improvements from 60.6% to 78.1% by post-test (Rashed et al., 2016). Overall, the results of the studies show significant improvement in post-test results after educational interventions had taken place, even within different cultures and applying slightly different methods.

## **RECOMMENDATIONS**

### *KNOWLEDGE GAINED ABOUT STUDY DESIGN*

Several lessons were learned while designing and executing this intervention. Advertisement through social media, personal and professional contacts, and peer groups were shown to be effective recruiting methods for this population. We suggest presenting the information in the native language of the target population, as participants expressed appreciation for this consideration. When considering the scheduling of the event, a Friday night was an effective time frame that supported participants bringing a friend or family member to participate in the intervention. Providing food helped incentivize participation and was well received by participants. For study management, using electronic consent forms and surveys may prove to be more efficient throughout the study instead of using paper copies.

In the future, researchers should consider what constitutes an appropriate “start time” and allow for late arrivals to still participate using a flexible study design, in order to take advantage of participants’ willingness to be involved. We recommend securing a more accurate count of participants who will be attending the intervention in order to plan and ensure sufficient supplies and food. We also recommend participants being served their meal instead of offering it buffet style, since portion control can influence blood glucose levels. It is recommended researchers contact participants three to five days in advance of the intervention to encourage participation.

We encourage working closely with the presenters and offering the intervention in the participants’ native language, as we did in this study. Because of differences in rates of DM in Hispanic American subgroups, we feel it is important to target individual subgroups in future education interventions (Balfour et al., 2016) and where possible, offer the intervention to more individuals.

Based on the results of our study, Hispanic Americans were able to identify a health education need, were eager to receive education, and showed improvement in several areas during the intervention. It is unknown why certain questions showed a loss of knowledge from Time 1 to Time 2 (Q3, 4, 13, 14). A qualitative inquiry might be considered to inform the data regarding knowledge losses specific to those questions. Future studies could focus on other novel ways to engage this population to promote their personal health, including longitudinal studies to demonstrate knowledge retention over time.

## **LIMITATIONS**

The results from this study need to be interpreted with caution considering the non-experimental design of the study and the small sample size. A validated survey tool was not used. The current tool should be validated if it is used for future studies.

During the intervention, paper consent and pre- and post-tests were difficult to manage especially since some attendees arrived several minutes late. Some participants did not confirm they were planning to attend but attended anyway, much to our delight. Consequently, those that were

not there from the beginning missed parts of the education intervention but were still given the opportunity to fill out the post survey (however, this data was not included in the paired sample t-test analysis). Our sample would have been larger if we could have included all who attended the intervention. Designing an intervention that can be flexible to meet the needs and actions of the participants should be considered.

Lastly, even though participants were given the opportunity to sample diabetic-friendly foods during the intervention, some had multiple portions which is not consistent with intake recommendations and portion control. Reflecting on these limitations will help us as novice researchers improve our research skills in the future.

### **LEADERSHIP IN NURSING**

As newly graduated nurses, the Hispanic American population is often under our care. Through doing this research, we have identified that Hispanic individuals are interested in improving their health and will participate in activities designed to teach them more about specific risks they face. The role of the nurse is to lead out in communities and educate them on how to prevent DM. Therefore, nurses can be agents to lead minority communities on finding appropriate resources and receiving proper and correct health education.

### **CONCLUSION**

It is essential for newly graduated nurses to be leaders in their communities, in particular by focusing on increasing education and health outcomes for minorities. In light of the expected rise of Hispanic Americans developing DM, increasing Hispanic American DM educational needs is essential in order to help influence a better quality of life for this community. For this reason, this educational intervention explored methods that may be effective for future health promotion and education in the Hispanic community. Subjects showed overall improvement in the majority of areas, such as DM effects on body systems and dietary management, however, it would be important to more fully address areas such as racial predisposition and insulin resistance impacting DM. This study has shown that clinicians and novice educators can engage Hispanic

Americans with DM education that targets their socio-environmental factors, such as nutrition or social support, to manage the rise of DM in this population.

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**APPENDIX: DIABETES QUESTIONNAIRE**

- Q1:** Diabetes is caused by a problem with my skin.
- Q2:** A person with diabetes should buy only special diabetic foods at the grocery store.
- Q3:** Salt has the biggest effect on blood sugar.
- Q4:** Physical activity is not good for people who are prediabetic or diabetic.
- Q5:** Eating fiber helps people with prediabetes or diabetes keep their blood sugar more stable.
- Q6:** Losing weight helps my body use insulin more effectively.
- Q7:** Eating too much sugar and other sweet foods causes diabetes.
- Q8:** If I am diabetic, my children have a higher chance of being diabetic.
- Q9:** Eating a high protein, low carbohydrate diet with healthy fats helps blood sugar be more stable.
- Q10:** Diabetes can hurt my kidneys.
- Q11:** The way I prepare my food is as important as the foods I eat.
- Q12:** Olive oil and canola oil are considered healthy oils for cooking.
- Q13:** It really doesn't matter what foods I eat.
- Q14:** Hispanic people have a lower risk for diabetes than Asian or Caucasian people.
- Q15:** Regular check-ups with my doctor can help me spot early signs of diabetes.
- Q16:** Diabetes will not affect my eyes or toes or heart.
- Q17:** Eating more protein and fewer carbohydrates supports healthier eating.

**Q18:** Rice and flour are sources of carbohydrates.

**Q19:** Diabetes is diagnosed by a urine test.

**Q20:** Diabetes can lead to stroke, heart attack, and sexual problems.

(Lloyd, 2008; Garcia et al., 2001; American Diabetes Association, 2019)