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## Improving Self-Management of Diabetes with Culturally Sensitive Interventions

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**Improving Self-Management of Diabetes with Culturally Sensitive Interventions**

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NSC 994 DNP Project

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**Abstract**

Adult Latino patients with diabetes may require education and skills that are culturally appropriate to achieve optimum results. The purpose of this DNP project was to improve diabetes self-management among Latino and other at-risk adults. The project used an intervention bundle to streamline screening, education, and improve patients' self-confidence. Adult patients were screened during triage to obtain vital signs and blood glucose levels per the routine at the clinic and via phone to discuss management of diabetes. Implementation of the project included provision of culturally sensitive diabetes education material, culturally sensitive "traffic light" food guide in English and Spanish. The Diabetes Self-Management Questionnaire was the primary tool used before and after the implementation to determine the effect of the intervention. In total, 44 adults participated in the intervention. The results demonstrate a positive impact of the culturally sensitive "traffic light" food guide in participants' knowledge and selection of healthy food. The nurse practitioners, physician assistant, prelicensure and nurse practitioner students at the clinic were in favor of continued use of the materials. The findings support the use of culturally sensitive food guide to improve diabetes self-management in Latino and a culturally diverse patient population.

*Keywords:* diabetes, Latino, adults, self-monitoring, blood glucose, A1C

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### **Improving Self-Management of Diabetes with Culturally Sensitive Interventions**

Diabetes management involves routine behaviors that may be operationalized overtime to avoid poor health outcomes (Reininger et al., 2020). Patients may be at greater risk for poor management of diabetes if they experience language barriers, cultural barriers, and limited access to care which are common among the Latino population. Alsaedi and McKeirnan (2021) reported that providing culturally sensitive education tailored to patients' individual learning styles, spoken language, and individual needs can improve health outcomes and patients' trust of health care providers. The purpose of this DNP Project was to offer evidence-based guidance on diabetes self-management to at-risk population in the partnering organization. The goal was to realize an improvement of management of diabetes through utilization of culturally sensitive interventions.

#### **Background and Significance**

Adults in the United States (US) have a 40% chance of developing type 2 diabetes. Latino adults in the U.S. have a 50% greater risk (Centers of Disease Control and Prevention, 2022). National Institute of Diabetes and Digestive and Kidney Diseases (2020) indicated that an estimated 34.2 million people in the U.S have diabetes mellitus (DM). A report from 2018 by the Office of Minority Health (OMH) at the U.S Department of Health and Human Services (HHS) indicated that Latinos were 1.3 times more likely than non- Latino whites to die from diabetes, and that Latino adults have a 70 percent chance of being diagnosed with diabetes by a physician, compared to non- Latino whites.

### **Impact on Patients**

Failure to intervene may have a negative impact on patients. Complication of uncontrolled diabetes include diabetic ketoacidosis, hyperosmolarity, coma, renal disease, ophthalmic, neurological, and peripheral circulation disorders (Shrestha et al., 2019).

Proper diabetes related care comes with a cost to both the patient and the healthcare system.

Gu et al. (2020) found that it was crucial to prevent complications and reported that inpatients with a complication related to diabetes suffered from considerable impairment in health-related quality of life.

“Diabetes was the worst disease because you cannot eat what you want. You are always on a diet because your blood levels instantly rise when you step out of your diet. Even the slightest cut on your skin does not heal immediately. I have to keep extra insulin in my siblings’ and mother’s refrigerators so that I do not have to carry it with me, and it does not lose its effectiveness... I can’t take insulin with me to everywhere I go. Travelling was difficult for me because I have to store insulin at a cold temperature,” (Yilmaz et al., 2019, p.1810).

The chronic nature of diabetes, the expensive medications, attitudes and beliefs of patients contribute to diabetes management adherence level (Ishaq et al., 2021). People with a diagnosis of diabetes on average, have 2.3 times more medical expenditures compared to what it would be without diabetes (ADA, 2018). Patients with diabetes may have cultural practices and language barrier as determinants of health, leading to the need to address these barriers during management and delivery of care. Health literacy influences self- management of patients with diabetes due to the association of low-level health literacy with adverse health outcomes of



patients with chronic illness (Kim, 2021). Interventions for diabetes management should accommodate literacy levels for each patient and include translations as needed.

### **Impact on Healthcare System**

From a healthcare system perspective, the American Diabetic Association (ADA, 2018) reported that total costs of diagnosed diabetes were estimated at \$327 billion in 2017, an increase from \$245 billion. Willey et al. (2018) noted high and steadily increasing expenditures for diabetes management and suggested that estimation methods must be selected to effectively provide a comprehensive picture of the economic burden of diabetes. Diabetes care has a significant financial impact on individuals and the society, with an annual estimate of diagnosed diabetes in the U.S in 2017 at \$327 billion, and an increase of economic cost of diabetes by 26% from 2012 to 2017 (ADA, 2022). Campbell et al. (2021) indicated that individuals with a diagnosis of diabetes experiencing homelessness, need more support for improved nutrition and self- management while homeless and newly housed.

### **Impact on Community**

Managing type 2 diabetes is complex and situational, therefore health care providers should acknowledge the contextual factors that impact individual health beliefs when tailoring treatment plans (Sadlon et al., 2020). Community food security, care partners in self- care, and community opportunities for diabetes support were themes identified as narratives of barriers and facilitators that influence type 2 diabetes self-management (Jones et al., 2020). The community around the clinic will benefit from receiving a culturally sensitive food guide while learning diabetes self- management tips during follow up visits for diabetes management. Marsh et al. (2022) highlighted the importance of capitalizing on the strengths of well- integrated community-based interventions vital in improving diabetes and outcomes for older adults. The

providers at the clinic have limited time and may not always provide detailed patient-centered diabetes self-management education (DSME) to all patients who would benefit from the information. The DNP project piloted cultural and literacy appropriate DSME during triage and provided patients with culturally sensitive “traffic light” food guide (Appendix, A) and DSME handout (Appendix, C) to help reinforce diabetes management. The literature was a double-sided handout with culturally sensitive “traffic light” food guide on one side and the DSME on the other. The goal was to pilot a bundle of culturally appropriate interventions to improve diabetes related outcomes.

### **Standards of Care in Diabetes**

In an ideal world, what was the gold standard for diabetes related care? The American Diabetes Association produces a document called, “Standards of Care” regularly (2022). Regarding culturally appropriate care, it recommends that a patient-centered communication style that uses language unique to the person, active listening, acknowledgment of patient preferences, beliefs, literacy, numeracy, and potential barriers to care should be utilized for the achievement of optimum health outcomes and health related quality of life (ADA, 2022).

To summarize other key recommendations, individuals with diabetes should have an opportunity to receive screening and diagnosis. When diagnosed, there are certain key data points that are commonly monitored at office visits including, but not limited to, blood pressure, weight, waist circumference, fasting glucose, and A1C (ADA, 2022). Specific counseling was recommended for exercise and food intake. Patients should have a tracking mechanism in place to benchmark these outcomes (ADA, 2022). The Standards of Medical Care in Diabetes (ADA, 2022) recommended that interventions addressing low health literacy by focusing primarily on

patient education, self-care training or disease management in populations with diabetes could be effective in improving diabetes outcomes.

Most patients at Mission Arlington are Latino, uninsured and have low literacy levels. Current practice at the clinic does not have a standard patient education plan for patients. Providing diabetes self-management education material translated in Spanish language was beneficial for the patients. Providing culturally and literacy appropriate materials for diabetes education will lead to better management of diabetes at the clinic.

### **Importance of Self-Management**

Standards of care in diabetes indicates that self- management and support are essential in preventing acute complications and decreasing risks associated with long-term complications (ADA, 2022). Proper self- management of diabetes allows patients to identify concerning trends in their own health to seek medical care before experiencing severe complications. Provision of support and resources allows patients to have an adequate supply of medications and items necessary to manage diabetes. DSME was an essential component of diabetes management, which can be more effective if cultural factors that influence the development and progression of diabetes are considered (Aguayo et al., 2019). Without proper education on DSME and provision of resources for diabetes management, these patients could potentially experience worsening of diabetes and complications of poor health management. Interventions for diabetes management should promote self- management by enabling self- efficacy and improving medication access and use rates (Marquez et al., 2019).

Self-management support, community resources and policies, team-based delivery system design, evidence-based decision support, health systems with focus on quality and clinical information systems are core elements proposed by chronic care management model

(Center for Accelerating Care Transformation, 2022). A multidisciplinary healthcare team can achieve improved diabetes management in adults with diabetes by implementing care that is tailored to cultural beliefs of a diverse patient population and their support system.

### **Breaking Barriers and Bridging Gaps**

Health literacy varies among different patient populations. Latino patients who do not understand English may need resources translated in Spanish and visual aids for communication. Health care providers giving online health information should be aware of limited English literacy skills and Spanish language use as barriers for Latinos hence make information accessible to them (Millar et al., 2020). Cultural preferences like inclusion of family members and support system during provision of care should be acknowledged during provision of care to Latino patients. Burner et al. (2020) reported that social support intervention involving Latino patients' families and support system was highly acceptable and gave positive feedback for this approach.

Visual aids may help bridge gaps in health literacy. Utilizing visual aids to facilitate better comprehension of proposed nutritional choices and healthy lifestyle modifications may help reduce language barriers which adults with diabetes often experience. Use of visual aids like the culturally sensitive “traffic light” food guide and a pyramid representation of blood glucose and A1C ranges may assist with DSME among adults with diabetes. The Centers for Disease Control and Prevention (CDC) provides an action plan for asthma using “traffic light” colors (Appendix D). Green indicates that the patient is doing well, amber indicates that the patient is getting worse and red indicates a medical alert. In a final example, the Wellness Recovery Action Plan (WRAP) a “traffic light” handout is a mental health recovery education curriculum used as a visual aid of action planning during various stages of health (Appendix E). Similarly, a

“traffic light” visual aid with culture appropriate food guide and diabetes management helped bridge the gap of health literacy and language barriers for adults with diabetes.

### **Opportunity to Improve**

Testerman and Chase (2018) identified the need for customized DSME programs that meet the needs of patients, reduce the impact of diabetes, and consider the unique characteristics of target populations. Specific to this partnering organization, most patients at this clinic primarily speak Spanish and have low health literacy. The free clinic depends on donors, limited employed staff, students in health care programs and volunteers. There are only two permanent employees at the clinic and five volunteer providers who see a limited number of patients on specific or alternating days and limited hours. Most of the patients are seen by nurse practitioner and physician assistant students under the supervision of a nurse practitioner who is the director of the clinic. A high turnover of students and volunteers warrants the need for a standard resource for DSME to promote consistency and more effective patient education. Limited resources inhibit the provision of recommended supplies and culturally and literacy appropriate diabetes education.

Language barrier at the clinic leads to delay in care and potential miscommunication among patients and health care providers. Students on clinical rotations at the clinic, typically encounter patients during triage but do not have a consistent reliable tool for educating patients on medication adherence and DSME as they receive minimal orientation. Mbanda et al. (2021) provided a preliminary support for utilization of visual aids like pictograms or videos for persons with low literacy in health education, highlighting that the visual aids should be designed with input from the target population. A culturally sensitive “traffic light” food guide in English and

translated in Spanish for diabetes management, facilitated a universal process in educating diabetic patients at the clinic while bridging the gap of language barriers and low health literacy.

### **Proposed Evidence-Based Intervention and Purpose Statement**

Cultural influences and language barriers can have a negative impact on progression with diabetes management. An intervention bundle, using a “traffic light” approach, which included Spanish and English versions of patient education material on diabetes management (DSME) handouts on exercise, medication compliance, culturally sensitive “traffic light” food guide and 24-hour meal recall was used to improve compliance with ADA recommendations. Proper management of diabetes may be influenced by culture, cognitive status, economy, and other variables. The purpose of this DNP Project was to pilot a bundle of culturally appropriate interventions that would improve management of diabetes among Latino adults and other underserved patients at the partnering organization.

### **Review of Literature**

A formal review of literature (ROL) was conducted to answer the question, “Among Adults with diabetes (P), what strategies (I), improve management of diabetes as evidenced by lower glucose levels and lower A1C (O) over six weeks (T)?” The databases searched included CINAHL, PubMed and Cochrane library. The keywords used were diabetes, Latino, Adults, self-management, self-monitoring, A1C, and blood glucose. The findings were further narrowed by limiting the findings to publications in English, publications within the last five years, and academic journals. A total of 54 studies were found. After completing a hand search of the titles and abstracts, six studies were selected for inclusion. All evidence was appraised using the Melnyk-Fineout Overholt Rapid Critical Appraisal Forms (Appendix F & G).

**Relevant Studies***Evidence #1*

A systematic review (SR) and meta-analysis of 18 studies was done from five databases to determine the effectiveness of diabetes self- management education and research gaps in adult Latino population with diabetes type 2, indicating an overall reduction on A1C (Hildebrand et al., 2020). Consideration of cultural influences related to diabetes self- management education (DSME) and team-based approach could lead to better outcome for Latino patients. Hildebrand et al., (2020) reported that DSME provides knowledge necessary to enhance behavioral changes that improve glycemic control and can be compared to the effects of some type 2 diabetes medications.

This review included a combined total of 3969 Latino adults with type 2 diabetes, with findings indicating a moderate heterogeneity (Cochrane  $Q=30.977$ ,  $p =0.020$ ), thus rejecting the null hypothesis that the true effect size was identical in all the studies (Hildebrand et al., 2020). The researchers represented results through narratives, figures including funnel plots, flow diagram and tables. The meta- analysis of the 18 randomized controlled trials (RCT's) compared adult Latinos with type 2 diabetes randomly assigned to either DSME or usual care. The study examined duration of intervention, initial A1C of the intervention group, interventionist, and mode of DSME delivery (Hildebrand et al., 2020). Interventions in health care often involve cost, suggesting the need for financial analysis of anticipated cost associated with proposed implementation programs. This suggests a proposal that healthcare providers should plan to involve stakeholders or other financial support for ongoing DSME tailored towards Latino population. According to Hildebrand et al. (2020), researchers should influence stakeholders to

identify structural barriers to access and prescribe cost-effective proposals to improve access and health care outcomes for vulnerable populations.

The hierarchy of evidence for intervention studies ranks SR based on RCT's as the highest level of evidence, with increased validity and reliability (Melnik & Overholt, 2019). DSME with cultural strategies including use of bilingual staff was reported as a relevant intervention for adult Latino population aimed at improving management of diabetes evidenced by decreased A1C and blood glucose (Hildebrand et al., 2020). The SR's high level of evidence indicates feasibility to include DSME, a team-based approach and cultural strategies as part of the tool kit plus bundle of intervention approach to improve diabetes management in adult Latino population with diabetes.

### ***Evidence #2***

Burner et al., (2018) conducted a parallel, non-blinded randomized controlled feasibility study of 44 predominantly Latino patients (80%) with diabetes type 2 to determine the effect of using mobile health to improve social support for low- income Latino patients with diabetes type 2. Patients received a pre-existing mobile health curriculum called Text MED and FANS (family and friends network support). Patient care often involves other members of the patient's family who may impact their management of chronic diseases. Patients were randomized into interventions and followed for three months, which included FANS participants' return for post intervention interviews for qualitative analysis of data (Burner et al., 2018). A table was used to represent the intervention and control group patients with similar baseline A1C, social support, social connectedness, diabetes-related self-efficacy, physical activity, and diabetes self-care behaviors.



Preliminary diabetes -specific outcomes efficacy results reported by Burner et al., (2018) indicated that both groups experienced lower A1C at the follow-up, of which the intervention group had a higher drop in mean A1C from 10.4% to 9%, delta 1.4 [95% confidence interval; CI 2.3–0.4] compared to the control group's decrease in mean A1C from 10.1 % to 9.5%, delta 0.6 [95% CI 1.4 to -0.2],  $P = 0.296$ ). Burner et al., (2018) indicated that intervention including FANS, resulted in an increase in self-monitoring of glucose, with an increased mean frequency of self-monitoring of glucose increasing of 1.6 days/week compared to a decrease of 2 days/week, (CI 4–0.6,  $P = 0.02$ ).

Burner et al., (2018) reported that combining the mobile text in combination with FANS interventions could provide a solution that can facilitate scalability of mobile technologies enhanced with personal touch of social support. An emphasis on social support for Latino patients with diabetes and educating their family and friends about recommended diabetes self-management practices may increase behavior change and decrease barriers to healthy life choices (Burner et al., 2018).

The authors of this study classified the study as a randomized controlled feasibility study; however, the low sample size of 44 emergency room patients and components of the study ranks it as a level IV case-controlled cohort using Melnyk & Overholt (2019) hierarchy of evidence (see Appendix F). This study indicates the validity of including social support in mobile health (mHealth) texting of Latino patients with diabetes as part of DSME. The study reported that mHealth was a feasible and acceptable strategy to increase diabetes self-care resulting in better glycemic control and improved health awareness for the supporters too (Burner et al., 2018).

***Evidence # 3***

Reininger et al., (2020) conducted a 12-month RCT on 292 participants, to determine changes in A1C resulting from the effect of community led interventions among low-income Mexicans. Baseline A1C at the time of enrollment was  $\geq 9.0$  for SyV 1.0 and  $\geq$  for SyV 2.0. The control group in the Salud y Vida 1.0 (SyV 1.0) consisted of individuals with uncontrolled diabetes who received coordinated care in the clinic, at home and in the community (Reininger et al., 2020). Follow-up home visits and phone calls were made by a registered nurse, licensed vocational nurse, a research assistant, and an assigned community health worker (CHW). The intervention group Salud y Vida 2.0 (SyV 2.0) received SyV 1.0 enhanced with medication therapy management (MTM); behavioral health services; peer-led support groups; and additional community-based lifestyle programs which would include family (Reininger et al., 2020).

Reininger et al., (2020) reported a significant decrease in A1C values from baseline to 6 months follow up for the intervention and control groups ( $p= 0.001$ ) with the intervention group maintaining their A1C at 6 month follow up and the control group's adjusted mean A1C increasing from 9.83% at the 6 month follow up to 9.90% at the 12 month follow up. Some limitations of this study were reported as, limiting study to effectiveness of the intervention as a whole instead of evaluating the effectiveness of each specific component of the intervention (Reininger et al., 2020). Recommendations were made to conduct future research on the subject for a period longer than 12 months and to examine the effect of MTM and behavioral health supports individually (Reininger et al., 2020).

The study found that a combination of a variety of intervention strategies implemented under a chronic care management program over 12 months (Reininger et al., 2020). Involving a multidisciplinary team improved A1C outcomes at 6 and 12 months for low-income Mexican

American participants with persistent uncontrolled diabetes (Reininger et al., 2020). This RCT was ranked as a level II in Melnyk and Fineout-Overholt's (2019) hierarchy of evidence for intervention studies, therefore the findings are applicable for implementation strategies for improving diabetes management for Latino's with diabetes.

#### ***Evidence # 4***

Talavera et al., (2021) conducted a RCT culturally appropriate, team based primary care and behavioral health intervention in low income on 456 Latinos with type 2 diabetes and a HbA1c  $\geq 7.0\%$  [53.01 mmol/mol]. The study that lasted 6 months aimed at improving HbA1c, blood pressure, and lipids. The interventions included: four, same day integrated medical and behavioral co-located visits; (ii) six group DSME visits addressing the cultural dimensions of diabetes and lifestyle messages; (iii) and care coordination. The control group participants received standard diabetes care from primary care providers, with referrals to health education and behavioral health when necessary (Talavera et al., 2021).

A multi-level modeling analyses indicated a statistically significant Group x Time interaction for HbA1C ( $B = -0.32$ , where B=Results of multi-level models multi-level regression coefficients [ 95% (CI)] for the Group  $\times$  Time interaction. The outcome ( $\Delta\text{HbA1c} = -0.35$ ,  $p = < .05$ ) indicated statistically greater improvement in HbA1c for the intervention group (Talavera et al., 2021). A culturally appropriate model of highly integrated care provides strategies can facilitate self- management and disease management for Latinos with diabetes (Talavera et al., 2021). Findings in this RCT were presented in tables and figures.

Cultural competency was necessary to effectively provide care and education to Latino adults with type 2 diabetes. RCT are ranked second in Melnyk and Fineout-Overholt's (2019) hierarchy of evidence, the findings of this study are feasible in improving A1C levels for adults

with type 2 diabetes. Participants in the intervention group showed improved blood pressure and total cholesterol, although the change was only marginally significant. Intervention Between groups Group  $\times$  Time interaction B (95% CI) p value B (95% CI) p value B (95% CI) p value A1C (%)  $-0.02$  ( $-0.13, 0.09$ )  $0.72$   $-0.35$  ( $-0.49, -0.21$ )  $.5\%$ ), suggested the need to maximize cost and clinical benefit, where B represents unstandardized multi-level regression coefficients (Talavera et al., 2021).

### ***Evidence # 5***

Glantz et al., (2020) conducted a study evaluating the relationship between health insurance coverage, biological and psychosocial determinants of health. 106 Latino/ Latino adults with type 2 diabetes enrolled in the study between September 2017 and August 2018. Age, fasting glucose, waist circumference, systolic blood pressure, body mass index, relative fat mass and homeostatic model assessment for insulin resistance (HOMA-IR) were measured with some results being non-significant (Glantz et al., 2020). Health insurance was associated with better glycemic control due to sufficient access to preventative and maintenance health care.

Variations in significance level for some of the variables were reported; Age  $p=0.0008$ , A1C  $p=0.0307$ , fasting glucose  $p=0.0079$  and waist circumference  $0.0223$ , the rest of the variables' significance were listed as non-significant (Glantz et al., 2020). Physical activities, dietary modification, medication adherence and other factors may influence A1C for Latino patients with type 2 diabetes. Glantz et al., (2020) reported a significant difference between uninsured and insured for average steps per day and average steps per weekday measured by ActiGraph, of which uninsured reported more activity than insured participants, and no significance in difference in steps measured by Fitbit.

Glantz et al., (2020) compared the result of their cohort study with the results of a larger group, Latino Community Health Study/ Study of Latinos (HCHS/SOL) of 16,415. The authors did not find many associations between health insurance, the biological and psychosocial metrics. They reported the small sample size being a limitation for the application of the findings to a larger group (Glantz et al., 2020). The cohort study was ranked V1 per Melnyk and Fineout-Overholt's (2019) hierarchy of evidence. Some components of this study like physical activity, weight and other biological and behavioral determinants of health can be applied in the development of a tool kit and bundle of intervention for adults with type 2 diabetes.

### ***Evidence # 6***

Robinson et al., (2019) performed a 12-week study with an aim to promote the use of ADA guideline of care using the alphabet strategy (AS) on 34 uninsured patients with diabetes. Different studies with interventions targeting the increase of patient access to quality diabetes care were reviewed. Components of the alphabet strategy aligns with the recommendations of ADA. The interventions included advice, blood pressure, cholesterol, creatinine, diabetes, eye exam, foot exam and guardian drugs line ace inhibitors, aspirin, and statins (Robinson et al., 2019).

Some of the tests recommended by the alphabet strategy were substituted for similar tests, while others were sent out due to limited finances and resources at the free clinic. A comparison of the average completion rate before and after AS intervention for A1C, proteinuria, lipid panel, creatinine, foot, and eye exams, was made using a paired sample t test. Statistical significance was obtained only for A1C, proteinuria, foot exam and eye exam, however the authors did not specify values to illustrate the level of significance using p values (Robinson et al., 2019).

The ‘advice’ component of the alphabet strategy aligns with the intended intervention of providing DSME for Latino adults with diabetes. This study was ranked VI per Melnyk and Fineout-Overholt’s (2019) hierarchy of evidence. Limitations of the study included lack of financial resources to ensure provision of all tests, staff shortage, time constriction for providers to implement all interventions in one visit, small sample size and initial reluctance of providers to use the AIC due to limited time (Robinson et al., 2019).

### **Synthesis of Literature**

The formal review of literature of the six studies indicated statistical and clinical significance that support the interventions for educating adults with diabetes. All studies used AIC to measure the effect of interventions for samples studied. Emphasis on the use of interventions that are culturally tailored for Latino adults with diabetes was made by some of the studies. Barriers preventing proper management of diabetes in Latino adults with diabetes were lack of health insurance, language barrier and lack of knowledge. Education on management of diabetes may include analysis of AIC, review of food selection based on cultural preferences and ADA guidelines, medication adherence and physical activity.

The studies used a multidisciplinary team approach to implement interventions for better outcome. Visual aids, use of translation services and bilingual staff could promote better adherence to treatment plan. A diabetes monitoring tool kit with a record sheet for medications, weekly weight, and visual aid culturally sensitive “traffic light” food guide could be effective in improving A1C in adults with diabetes. The importance of social support was highlighted in some of the studies, due to better results noted among participants with good support from family and friends. Involving the patients’ support system would help hold the patients accountable of their health.

Cultural factors that influence the development, management, and progression of diabetes in patient populations should be considered to provide effective plans for management of diabetes in Latino population of the United States (Aguayo-Mazzucato et al., 2019). Promoting good patient and provider relationships will promote trust and result in adherence to treatment plan. Considerations of social determinants of health should be addressed to decrease barriers to health promotion. Patients should be equipped with sufficient education to avoid acute episodes of uncontrolled blood glucose and complications of diabetes.

### **Guiding Theory**

Albert Bandura (Appendix H) developed Social Cognitive Theory (SCT). Bandura (2006), explained in his autobiography that the word “social” in the theory acknowledges the social origins of much human thought and action, whereas the word “cognitive” acknowledges the influential contribution of cognitive processes to human motivation, affect and action. Peoples’ behaviors can be influenced by their association with their social network, their beliefs, and their perceptions. Bandura (2004) reported that helping people reduce health- impairing habits by health communication, requires emphasis on enabling individuals with self-management skills and self-beliefs necessary to take charge of their habits. Somsak et al., (2019) indicated the importance of considering the unique social aspects for individuals with any medication condition and how people obtain knowledge and sustain behavior while acknowledging their environmental influences.

Adults with diabetes may demonstrate self- management of diabetes and health seeking behavior based on internal and external factors, that health care providers should explore. Health care providers should establish relevant treatment or disease management plans after exploring factors that influence behavior Cultural factors can influence food choices which

may not align with recommended dietary conditions. Emphasis on social support in diabetes self-management can lead to improved metabolic control, achievement of self-management goals and foster psychological adjustment to diabetes (Somsak et al., 2019).

### **Organizational Description**

Mission Arlington Medical Clinic was established more than 20 years ago to provide quality health care at no cost to low-income Tarrant County, Texas residents. The clinic provides medication, primary care screening and limited patient education to patients, to promote long-term health choices. The Mission Arlington Medical Clinic report “looking-back-our-year-in-review” indicates that in 2021, the medical clinic treated 8,591 patients and provided over \$1.3 million worth of free health care and more than \$729,000 worth of free prescriptions. According to the same report, diabetes was listed as the top medical problem at the clinic, followed by hypertension. The clinic operates on donations and government funding and is always in need of volunteer health care providers (Personal communication A. Wilson, 2021). The clinic will be de-identified as an outpatient free clinic in Texas.

The clinic has a mission to provide quality health care at no cost to low-income residents in Tarrant County. The clinic has experienced an increase in the number of patients seeking free health care including management of chronic diseases over the years. The clinic facilitates access to community health programs, leading to better health management. Over 80% of patients seen at the clinic are Latino adults requiring long term management of chronic illness including diabetes. Care provided to this population should be culturally tailored to achieve optimal outcomes.



**Relevant Policy**

National Standards for Diabetes Self- Management Education and Support (DSMES, 2022) indicated the need to provide person-centered services that embrace cultural differences, social determinants of health (SDOH), and the dynamic technological systems (Davis et al., 2022). At the state level, the Texas Diabetes Council under the Texas Department State of Health Services has a vision of, “a Texas free of diabetes and its complications and a mission to effectively reduce the health and economic burdens of diabetes in Texas.” The state of Texas recommends specific initiatives to improve outcomes and minimize barriers that impact diabetes care and to improve delivery of care leading to increased access and high quality, affordable, effective, and effective care of diabetes and coordination of state services (Texas Health and Human Services, Jan 10, 2022).

At the county level, Tarrant County public health department does not have any policies specific to diabetes. However, the division of chronic disease prevention provides free classes on demand. A certified health education specialist, a health educator, or a certified diabetes educator teach classes. The curriculum can include explanation of the meaning of diabetes, complications, risk factors, data relevant to the targeted community and prevention specific to diet and exercise (Tarrant County, Texas). Finally, the organization does not have any specific policy relevant to management of diabetes.

**Stakeholders****Organizational Stakeholders**

Stakeholders include the church leadership through which the clinic was established, donors, church members, community members, under-insured families, health care providers and

volunteers at the clinic. Nursing schools, physician assistant schools, high schools and medical schools rely heavily on the clinic for clinical rotations.

### **Intervention Group**

The intervention group consisted of adults with diabetes seeking follow up care at the organization. This project provided interventions tailored toward improving DSME among adults with diabetes and allowing health professions college students to engage in culture specific diabetes education.

### **Impact Population**

The DNP project impacted adults with diabetes and their family members. The DNP project allowed Latino adults to express their challenges to adhering to healthy food choices through translators who assisted with discussion of DSME handout and the “traffic light” food guide. The DNP project influenced the health professional students’ approach in providing culturally tailored diabetes education to diverse populations in the future. The culturally sensitive “traffic light” food guide was authorized for continued use at the clinic.

### **Organizational Assessment**

A strength, weaknesses, opportunities, and threats (SWOT) analysis indicated a need for interventions that can improve management of diabetes in adults. The community, donors, volunteers and the recognition of the need for free healthcare are strengths for this organization. Weaknesses include lack of sufficient staff to serve patients, lack of enough supplies, language barriers and lack of sufficient space for conferences and patient education.

Opportunities at this organization include willingness of patients to follow guidelines for diabetes management, ability to utilize undergraduate nursing students’ expertise to educate patients on diabetes and obtain vital signs, patients’ height, weight, waist circumference and

blood glucose during triage. Nurse practitioner, physician assistants and medical students can perform point of care A1C testing during visits. Threats at the organization may include patients failing to return for follow up appointments due to lack of transportation, lack of consistent staff and patients' inability to afford healthy food due to limited finances.

### **Congruence of DNP Project**

Testing done for all patients includes blood glucose and A1C, only for patients with previous diagnoses of diabetes or patients with elevated blood glucose. Most of the patients that come to the clinic lack education about management of Diabetes. The clinic's mission of providing quality care aligns with the DNP project's aim of improving diabetes management in adults with diabetes. Latino patients comprise over 80% of the population at the clinic, therefore interventions should be customized to serve the needs of most patients served by the clinic.

### **Statement of Mutual Agreement**

A statement of mutual agreement (Appendix I) was obtained from the director of the clinic allowing the DNP project to be implemented.

## **Methodology**

### **Aims and Objectives**

The proposed DNP Project was a quality improvement initiative that collected and analyzed pre and post intervention data. The aim was to offer culturally appropriate diabetes care to improve outcomes. To achieve this aim, the following objectives were outlined:

**Objective 1:** Adapt teaching materials to appropriate health literacy level and translate food choices to a "traffic light" food guide.

**Objective 2:** 100% of diabetic patients in clinic will receive the materials.

**Objective 3:** Evaluate outcomes and document a 10% reduction in each: A1C, waist circumference and weight.

**Objective 4:** Self-management tool reflecting improved diabetes management and self-confidence in 20% of the participants.

**Objective 5:** Implementation resulting in adaptation of the culturally sensitive “traffic light” food guide per objective .

### **Design, Implementation Framework & Plan**

The Institute of Healthcare Improvement Model (IHI) was used for the DNP project. Stages in the IHI model include Plan, Do, Study and Act (PDSA). The ‘Plan-stage’ mentioned poor diabetes management as the problem and an intervention bundle for DSME as the proposed solution. The plan included a list of the outcomes to be measured at least two weeks before the project. Hard copy consents were reviewed with patients and patients were allowed to ask any questions before receiving the “traffic light” food guide. The DNP project included a culturally sensitive “traffic light” food guide, for providers and health professions students to use for diabetes self-management patient education.

A one-page document including culturally sensitive food options grouped in traffic colors (green, amber, and red) was used to promote diabetes self- management during triage and follow up phone calls. Foods included in the culturally sensitive “traffic light” food guide were selected through review of recommendations of food selection per ADA, and review of foods consumed by Latino adults as well as some food commonly consumed by patients from other cultural backgrounds. DSME was a handout which emphasizes medication management, food selection and exercise as already included in care of patients with diabetes at the clinic.

The ‘Do-stage’ started at the first contact where BP, blood glucose and A1C was obtained. Participants were educated on healthy food selection using a traffic-light” food guide, DSME handout (Appendix H), 24-hour food recall and encouraged to exercise at least three times a week for at least 30 minutes each time. Copies of the “traffic-light” food guide and DSME handout were reviewed with patients and placed in patient examination rooms, and triage room. Patients were instructed to record their food choices, exercise frequency using smart apps or on a record sheet. The same process was repeated for four weeks.

During the ‘Study-stage,’ outcomes were compared with the initial benchmark to determine if implementation of the plan met goals. The results were analyzed to establish statistical significance. ‘Action-stage’ were determined by validated results and the need to replicate the interventions. A decision to place the culturally sensitive “traffic light” food guide and DSME in folders plastic inserts to protect the materials overtime. A decision was made that patients with diabetes will be allowed to take pictures of the culturally sensitive “traffic light” food guide due to unsustainability of color printing at the clinic. The ‘study- stage included review of patients’ food preferences and lifestyles influenced by culture. The tools used for the DNP project were translated in Spanish and volunteer translators used to cater for most patients at the clinic.

### **Institutional Review Board, Ethics, and Consent**

Eastern Kentucky University’s Institutional Review Board was used for the DNP project. All information about the project were disclosed to the participants prior to the start of the project. Participants were informed that they could opt out of the study anytime and their decision would not impact the services they received at the clinic. Written informed consents will be obtained prior to the start of the study. A Spanish version of the informed consent was

available to cater for patient preference.

Provision of free medical care to a diverse patient population aligns with beneficence. American Nurses Association (ANA) code of ethics for nurses, reports that nursing includes the protection, promotion, and restoration of health and well-being, prevention of illness and the relief of suffering in the care of patients, their families, communities, and commitment to social justice. The DNP project provided education resources to patients at the clinic, aimed at improving their well-being and alleviating suffering from potential complications overall.

**Data**

**Data Collection Process**

The plan for data collection was outlined in the table below. All clinical data was standard of care. However, the goal was to streamline a more consistent process given the continuous rotation of clinical staff.

*Table 1.0 Data Collection Plan*

Overall Project Design								
1 <sup>st</sup> 2 weeks before study Select charts for Diabetic patients	BP, Pulse	BG	Weight	A1C				Demographic Questionnaire
2 <sup>nd</sup> Initial encounter with patient  Implementation begins	BP, Pulse	BG	Weight		Waist (Inches)	24-hour food recall	Activity- miles, minutes	Validated tool-DSMQ Traffic light Food guide DSME handout
3 <sup>rd</sup> Comparison made with previous results	BP, Pulse	BG	Weight		Waist (Inches)	24-hour food recall	Activity- miles, minutes,	
4 <sup>th</sup>	BP, Pulse	BG	Weight	A1C	Waist (Inches)	24-hour	Activity-	Validated tool-DSMQ

Comparison made with previous results						food recall	miles, minutes,	Process Eval
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A series of tools and instruments were used to collect data. Each was described here. A description of analysis will follow in the next section.

***Demographic Questionnaire***

A demographic questionnaire (Appendix K) was used to obtain each participant’s information on the first visit. Culturally appropriate culturally sensitive “traffic light” food guide was given to patients at the beginning of the DNP project. All materials reviewed weekly during follow up visits and over the phone. Volunteer translators and google translator were used as customary to the process at the clinic.

***Diabetes Self-Management Questionnaire (DSMQ)***

A validated instrument Diabetes Self-Management Questionnaire was given to participants for pre and post evaluation of themes of patients’ perception of DSME pre and post intervention. Schmitt et al. (2013) reported validity of DSMQ as a 16-item questionnaire for assessing self- care activities related to glycemic control. The tool was developed based on theoretical factors and a process of empirical improvements.

***Benchmarks Related to DM Outcomes***

Participants’ A1C, blood glucose, weight, BP, and pulse were obtained from chart reviews at least two weeks before the start of the project. During the weekly visits or follow up phone calls, outcomes including blood glucose and weight were collected and compared with previous results. Getting waist circumference was not possible due to the limited space in the triage room, often prompting the need to have two patients in the triage room at a time. AIC was collected before the start of the project in September 2022 and at the end of the project for those who had drawn in January 2023.

***Process Evaluation***

Evaluation of the process for the DNP project involved consultation with the clinical director to determine how well the patients responded to the implementation process. The process of implementing the project took longer than anticipated due to limited resources and language barrier. Implementation was interrupted on several occasions due to turn over of volunteer Spanish translators at the clinic. Records of time spent, patients' response and resources used or needed was analyzed to determine how the process should be improved in the future. A decision was made that patients would be introduced to the culturally sensitive “traffic light” food guide and allowed to take pictures of the culturally sensitive “traffic light” food guide to review with their households.

**Data Analysis Plan**

The demographic information was analyzed using descriptive statistics. The open-ended questions were reviewed by one investigator and coded for themes. The validated instrument DSMQ was used for the pre-test/post-test and the findings were analyzed first with descriptive statistics and then with inferential statistics, particularly the paired-sample t-test. The Cohen D, for effect size was run. Comparison of measured outcomes (AIC) was made by getting the average change at the pre and post points of the DNP project.

**Storage and Security of Data**

Data was collected from participants' charts before initial contact with participants at the clinic, as part of the participant selection process. Patient information was de-identified by labelling participants as numbers. Additional participants' data was collected during office visits or follow up calls. Data will be stored in ECU Google Drive. Pre and post DSMQ results were used to determine themes for outcomes.



### **Timeline, Resources, and Budget**

The DNP project was implemented over six to eight weeks. Patients were randomly selected over two to three weeks and contacted during their visit at the clinic or via phone calls. Majority of the participants received weekly follow up phone calls, while some received in-person follow up if they were scheduled to return to the clinic per their provider's advice. Elements of the budget included direct labor, direct materials, stationery, office space and travel. The only actual cost specified was printing, purchase of folders, binders and plastic paper inserts to protect the materials given or used for patient teaching. Color copy print per page costed \$ .15 at the local public library, black and white copies were \$.10 per page. Total cost for printing was about \$100 for the "traffic light" food guide, DSME handout, DSMQ and demographic questionnaires. The binders, folders and paper inserts costed about \$50. The DNP project would have required an estimate of \$1,175 (Appendix L).

### **Results**

A total of 44 patients volunteered for this project which was represented about a third of the patients seen at the clinic every week. The results of the project are presented and discussed in sections 1) results of *demographics survey*; 2) results of the *DSMQ prior to the intervention and after implementation*; 3) result of the *evaluation of the intervention*. Qualitative and quantitative results will be presented where applicable in each section. Recruitment, data collection and intervention started October 3, 2022 and continued over selected dates until data collection from patients was completed on December 8, 2022. An extension was requested due to inclement weather interference and thanksgiving break. An extension was granted until January 31, 2023. This extension allowed collection of post intervention A1C values from the patients'

charts. At the end of the project the DSMQ was given to participants to determine the impact of the “traffic light” food guide. Data was analyzed using excel to determine effect size.

### **Recruitment**

Subjects for the DNP project were adults with diabetes who were established patients at the clinic. Inclusion criteria recruited adults (18 years and older), diabetic patients and those ability to make it to follow up appointments or those who provided phone numbers for follow up. Exclusion criteria included failure to attend provider appointments, failure to answer follow up phone calls and lack of reliable transportation to clinic. The goal was to recruit 50 adult patients with a diagnosis of diabetes, 44 adults were recruited over a period of 2- 3 weeks. Recruitment flyers (Appendix J) were distributed to the clinic a week before the start of the project.

### **Results of the Demographic Questionnaire**

The demographic questionnaire was completed by 44 patients (N=44) with a diagnosis of diabetes. Quantitative statistical data analysis was done to measure central tendency. The mean age for the participants was 53, median 54 and mode 50. These findings indicated that majority of the participants were in their 50s. Majority of the participants (n=36, 81.8%) spoke Spanish as their preferred language of communication, validating the need to have education materials translated in Spanish. Most of the participants (n=39, 88.6%) reported that they rely on (family or friends) or vouchers to get to the clinic for follow up appointments. Participants mentioned poor food choices, lack of exercise and inability to afford medication refills as challenges on health. Some of the participants were accompanied by their family members to the clinic. The primary investigator (PI) noticed that some participants (n=12, 27.2%) were accompanied by have support of their family and friends in management of health.

### Results of the *DSMQ*

To review, the DSMQ is a 16-item questionnaire which was given to patients at the beginning of the project and at the end of the project. The DSMQ questionnaire is a 4-point Likert scale validated tool which consists of both positively and negatively worded statements (Márkus et al.,2022). The DSMQ four subscales; five items for glucose management, four items (item numbers 2, 5, 9 and 13) on dietary control, three items on physical activity. Three items on health care use and one general statement (Márkus et al., 2022). The four points for the Likert scale were, *does not apply to me (0)*, *applies to me to some degree (1)*, *applies to me to a considerable degree (2)* and *applies to me very much (3)*. Selection of DSMQ items (items 2, 5, 9 and 13) under dietary control subscale, indicated an improvement in dietary management after the intervention (see table 2.0). Items 5 and 13 responses had p values of 0.01235 and 0.01364 respectively indicating statistical significance. Items 2 and 9 ( $p= 1.820, 1.7762$ ) did not indicate statistical significance. The results indicated that most of the patients struggle with consumption of high calorie foods and food binges. There was an overall improvement in participants responses reflecting a positive outcome for the DNP project which emphasized on food selection.

*Table 2.0 DSMQ Dietary Control Items Subscale*

<b>Item #</b>	<b>DSMQ Dietary Control Items Subscale</b>	<b>Percentage Positive Change in Responses</b>	<b>P- Value</b>
<b>2</b>	The food I choose to eat makes it easy to achieve optimal blood sugar levels.	54.6	1.82078
<b>5</b>	Occasionally I eat lots of sweets or other foods rich in carbohydrates.	20.5	<b>0.01235</b>
<b>9</b>	I strictly follow the dietary recommendations given by my doctor or diabetes specialist.	36.4	1.7762
<b>13</b>	Sometimes I have real ‘food binges’ (not triggered by hypoglycemia).	9.1	<b>0.01364</b>

### **Result of the Evaluation of the Intervention**

The culturally sensitive “traffic light” food guide was reviewed with 44 participants at the beginning of the DNP project. All the 44 participants accepted to take the culturally sensitive “traffic light” food guide with them and was informed of the planned follow up. Patients who did not understand A1C values and how to maintain a healthy lifestyle were referred to the DSME handout. One out of the 44 participants indicated that she did not want to participate as she did not believe she had diabetes.

There was an attempt to call the remaining 44 participants for follow up and to determine if they were using the “traffic light” food guide. Most of the patients who responded all indicated better food choices, medication adherence and increased physical activity. Responses from participants during the follow up calls were analyzed for themes including medication adherence, physical activity and food choices. Results were represented in a table labelled “Qualitative Table Showing Outcome” (see appendix M).

### **Benchmarking Patient Outcomes**

A comparison was made between the A1C values obtained at the start of the project (October) and the A1C values obtained after completion (January 2022) of the project. The A1C values were obtained from the chart and may have been taken at different intervals for each of the participants. Out of 44 participants, the P.I was only able to obtain 17 values after completion of the intervention compared to 44 A1C values obtained at the beginning of the study. The A1C values had been ordered per patient needs and health care provider discretion. Results were analyzed to determine effect size Cohen's  $d = 0.411986$ , Glass's  $\delta = 0.380243$  and Hedges'  $g = 0.396508$  (see table 3.0).

Table 3.0 A1C Difference Pre-Post Implementation

	AGE	A1C Sept- October 2022 N=44	A1C Jan 2023 n= 17	Blood Glucose
MEAN	53	8.45909091	7.770588	194.5
MEDIAN	54	8.15	7.9	159
MODE	50	8.1	7.9	184
STANDARD DEVIATION	9.2253901	1.81240149	1.520594	104.544527

Cohen's  $d = (7.77 - 8.459) / 1.672385 = 0.411986$ .

Glass's  $\delta = (7.77 - 8.459) / 1.812 = 0.380243$ .

Hedges'  $g = (7.77 - 8.459) / 1.737669 = 0.396508$ .

An effect size of 0.5 indicates medium effect of the intervention and 0.2 effect size indicates small effect of the intervention. The DNP project had a close to medium effect on the participants.

### Discussion

The DNP project was initiated by recruiting 44 participants who received the “traffic light” food guide. It was not feasible to give the culturally sensitive “traffic light” food guide to 100% of diabetic patients at the clinic per objective 2. A1C was checked on 44 participants pre-implementation, however, A1c was available for 17 of the participants post implementation. Weight and waist circumference were not checked post implementation as most of the follow up was done via phone. Majority of the patients reported better food choices and using the culturally sensitive “traffic light” food guide to select food frequently.

Patients with diabetes may experience different challenges which can be attributed to social determinants of health including educational opportunities, employment status, insurance status among others. Frier et al (2022) indicated that education on diabetes could be more personalized when there is significant understanding of how their social situations influence their

motivation to self- manage diabetes. The participants were mostly Latino and preferred communication in Spanish (n=36, 81.8%). Family and friends’ support was identified as important for most of the participants (n=39, 88.6). These findings are consistent with the literature.

The DSMQ was completed by participants at the beginning and at the end of the project to show changes in perception and behavior relating to the culturally sensitive “traffic light” food guide usage. Majority of the participants verbalized using the culturally sensitive “traffic light” food guide and reported improved dietary choices. Participants (n=43) reported use of the culturally sensitive “traffic light” food guide as verbalized during follow-up. One participant refused to follow up, reporting that she did not believe she had diabetes. The percentage improvement in pre-post positive responses for the DSMQ dietary control items ( 2, 5, 9 & 13) were 54.6, 20.5, 36.4 and 9.1 respectively, indicating improvement in dietary choices related to use of the culturally sensitive “traffic light” food guide. The mean AIC at the end of the project was lower (n= 17, 7.77) compared to (n=44, 8.459) at the beginning.

DSME tailored to specific patient needs is supported by literature reviewed for this project (Hildebrand et al., 2020; Burner et al., 2018; Reininger et al., 2020; Talavera et al., 2021; Glantz et al., 2020; Robinson et al., 2019). The review of literature suggested that DSME facilitates behavioral changes that improve management of diabetes (Hildebrand et al., 2020). Social cognitive theory guided the basis of this project as it highlighted the interaction between the patient, environmental factors, knowledge, personal, behavior and social factors as potential influences on an individual’s perception of health and decision to follow a treatment plan (Bandura, 2006).

Limitations of findings included language barrier which was a challenge due to the large

population (greater than 80%) of Latino patients seen at the clinic. Bilingual volunteers translated communication between patients, providers and explained the DSMQ to patients as much as there were Spanish and English versions of the documents used during implementation of the project. During translation, intended communication may have been altered because the translators were not certified and were volunteers at the clinic or bilingual health care professionals. Bias could not have been eliminated during the process of translation especially when patients were on the phone. Google translate and Microsoft translation tool were used as needed, however, these are not approved as reliable tools for translation for medical purposes, thus leading to potential misinterpretation.

Limited handsets at the clinic delayed follow up calls due to the need for use of the two available handsets for daily operation at the clinic. Some of the participants had low literacy levels and felt challenged understanding written Spanish and English words. Questions and instructions were repeated multiple times for patients to understand the recommendations per DSME. Patients' 24 hour- meal recall and exercise regimen narration were not consisted for patients due to low literacy level and language barriers for most of the participants. Most of the patients said they could not remember most of what they ate or said they ate similar food items most of the time adding vegetables and fruits during follow up calls.

Color printing is not available at the clinic and is expensive, therefore practitioners will have to review the culturally sensitive "traffic light" food guide with patients and have them take pictures of the tool for future use. Some of the patients did not have smart phones for taking photos, hence may have missed out on having the images of the culturally sensitive "traffic light" food guide for reference.

### **Implications**

The DNP project had implications in clinical practice, policy, education, quality and safety as recommended by American Association of Colleges of Nursing essentials (AACN, 2015). These are discussed below.

#### **Clinical Practice**

Providing participants at the clinic with a culturally sensitive food guide (“traffic light” food guide) and a DSME hand out containing basic information on diabetes including food choices, exercise and medication adherence, resulted in mostly positive outcome. The health care providers at the clinic were exposed to the culturally sensitive food guide and they were willing to implement its use at the clinic. The healthcare profession students doing their clinical rotation verbalized confidence in talking to patients about management of diabetes while allowing them to review the culturally sensitive “traffic light” food guide which was culturally sensitive and listed foods common to the large Latino patient population at the clinic. Five folders with both English and Spanish versions of the culturally sensitive food guide were placed in patient care rooms for health care providers to review with patient and allow patients to take pictures of the tools.

Based on the positive impact of the “traffic light” food guide, I recommend that clinics use standardized culturally sensitive tools for educating diverse populations. Clinics should evaluate patients’ cognitive and cultural needs while creating materials to be used for patient education on diabetes. Healthcare providers’ communication using cultural competence during patient interaction, promotes empowerment, and indicates that lives can be positively impacted gradually with the anticipation of major changes in the future (Maness & McCauley, 2020). I



recommend that health care practitioners empower patients to use DSME materials and use qualified translators or translation resources to ensure accurate transmission of content.

### **Education**

Participants verbalized using the culturally sensitive food guide to select their groceries and to make better choices of food to better manage their diabetes. Most participants were excited to see some of their cultural food items listed on the tool. Since majority of the participants spoke Spanish as their first language, they appreciated the Spanish versions of the tools. The culturally sensitive food guide was also presented to nursing students at the triage room and instructed to teach patients with diabetes about food selection using the “traffic light” food guide, and health care management to improve management of diabetes.

New healthcare providers, volunteers and health professions’ students should be oriented to the needs of clients and educated on the importance of using culturally sensitive strategies for DSME. The new health care providers at the clinic will be oriented to the culturally sensitive “traffic light” food guide and instructed to allow patients to take pictures of the tool. Patients will have an opportunity to report their use of the “traffic light” food guide. Based on the DSMQ results, patients with diabetes should be taught on healthy low-calorie snacks to curb food binges.

### **Quality and Safety**

The project focusses on improving self-management of diabetes among adults using the “traffic light” food guide, which promotes health food choices with a focus on diverse culturally sensitive food options. Selection of relevant patient-specific interventions for management of diabetes allows health care professionals to communicate better with patients. Patients at the clinic accepted the culturally sensitive “traffic light” food guide and were made aware of the

connection between healthy lifestyle and quality of life. Proper management of diabetes prevents complications of diabetes like retinopathy, which affects patient safety. Poor vision can be associated with chronic poor management of diabetes and can lead to unsafe living. The time take to review the culturally sensitive “traffic light” food guide was part of delivery of quality and safe health care. Care delivered safely leads to quality care. Quality care requires that health care interventions be delivered safely, effectively, timely, efficiently equitably and person centered (AACN, 2015).

Failure to provide culturally appropriate interventions for diabetes management would widen the gap of disease management for certain groups of patients. Culturally appropriate interventions allow patients to relate to the information provided by health care providers improving patient-provider relationships overtime. Good health outcomes could be noted as patients implement recommended health promotion and management options recommended by their health care team. Cost of health care management decreases with better management of health and improved outlook of health. Lack of culturally appropriate interventions for

### **Policy**

The clinic provides quality health care using limited resources since it is a charity health organization. Texas Health and Safety code, section 103.013 recommends the development and implementation of a state plan for diabetes treatment, education and training. The plan should address individual family needs and health care provider needs assessment to meet those needs (State Plan for Diabetes and Obesity Treatment, 2021). The DNP project aligned with the policy advocating for inclusion of individuals, families and health care professionals needs by making information available in Spanish and English to serve a diverse population. The color and culturally themed culturally sensitive “traffic light” food guide was applicable to patients with different food

preferences. The patients had a chance to identify foods that they should reduce, stop or increase in their food selection.

Currently, the organization does not have a policy specific to diabetes education or standard literature that is culturally sensitive to cater for the culturally diverse patient population. Practice should align with policies to foster better management of resources. If the organization established policies which guide culturally sensitive care delivery, more patients would benefit and be empowered to better manage their health at home. The organization should clearly communicate policies and procedures relating to DSME and update the policies regularly to adapt to change in the organization and in health care. Outdate policies may fail to meet benchmarks created for better operation of the health care industry.

### **Feasibility for Sustainability**

The DNP Project was sustained by the constant rotation of health care professions students at the organization, and the high rate of poorly managed diabetes among patients at the clinic. Availability of the “traffic light” culturally sensitive food guide to complement any other diabetes education materials available at the clinic provided a standard “script” for any of the health care professions students to use for patient teaching. The clinic often has more students than the available triage and filing duties, having the culturally sensitive “traffic light” food guide available gave them an opportunity to engage in health promotion for a diverse and underserved population.

Sustainability of the DNP project was feasible because of the increasing trend in diabetes diagnosis and insufficient knowledge exhibited by patients at the organization. Implementation of the DNP project was anticipated to be supported by the need of patients and the availability of health professions students consistently rotating at the clinic. Copies of required education

material are available in treatment rooms in Spanish and English. A note was placed on the folders with the culturally sensitive “traffic light” food guide for health care providers to review content with patients and to allow patients to take pictures of the “traffic light” food guide.

### **Future Scholarship**

I plan to disseminate this information to other healthcare professionals nationally and globally through publication in journals like American Journal of Nursing. A poster presentation at my work place is an opportunity I will explore in the future. The findings of this project will be disseminated to participants’ family and friends. The results indicated that patients could benefit from DSME that addresses elements of life specific to cultures. The health care professions students doing their clinical rotation at the clinic will have access to the culturally sensitive “traffic light” food guide and may continue using it at this organization and at other clinical locations as students and as future health care professionals. Volunteers at the clinic will interact more with patients through the delivery of DSME per the organization’s guidelines and available education material like the “traffic light” food guide.

Literacy level varied among the participants, therefore future tools intended for patient education at the clinic should include pictures of some of the common food types to allow patients to make better visual connection between recommended food options and better health outcomes. The P.I will consider cognitive and cultural variables while creating an education tool for a patient population that has a significant number of immigrants. It may be important to seek funding from stakeholders to finance the cost of printing colored education materials for the clinic. Future scholarship should include review of SDOH to promote inclusion of aspects affecting specific patient populations. The organization could be supported in seeking

partnership with printing companies with the community; like staples, Office Depot and FedEx to donate or sponsor printing materials meant to promote patient education.

### **Conclusion**

Diabetes management involves cooperation between health care providers, patients, and their support system. The DNP Project was implemented to improve self-management of diabetes in adults. The DNP Project aimed to improve patients' understanding of dietary modifications and lifestyle changes that may lead to better management of diabetes. A culturally sensitive approach facilitated outcomes. The problem identified for this project was poor self-management of diabetes among adults. More than 80% of the population at the organization are Latino and needed to get education on diabetes management with specification on culturally sensitive food selection guide. The culturally sensitive "traffic light" food guide complemented the diabetes self-management education that the clients were already receiving at the clinic. The culturally sensitive culturally sensitive "traffic light" food guide caught most of the participants attention as they could relate to some of the listed items like "jarritos"(Mexican soda), "paratha" (Indian- bread), "puff puff" (African doughnut). Results of the project indicated that patients' food selection was healthier at the end of the project as compared to what it was at the beginning of the project.

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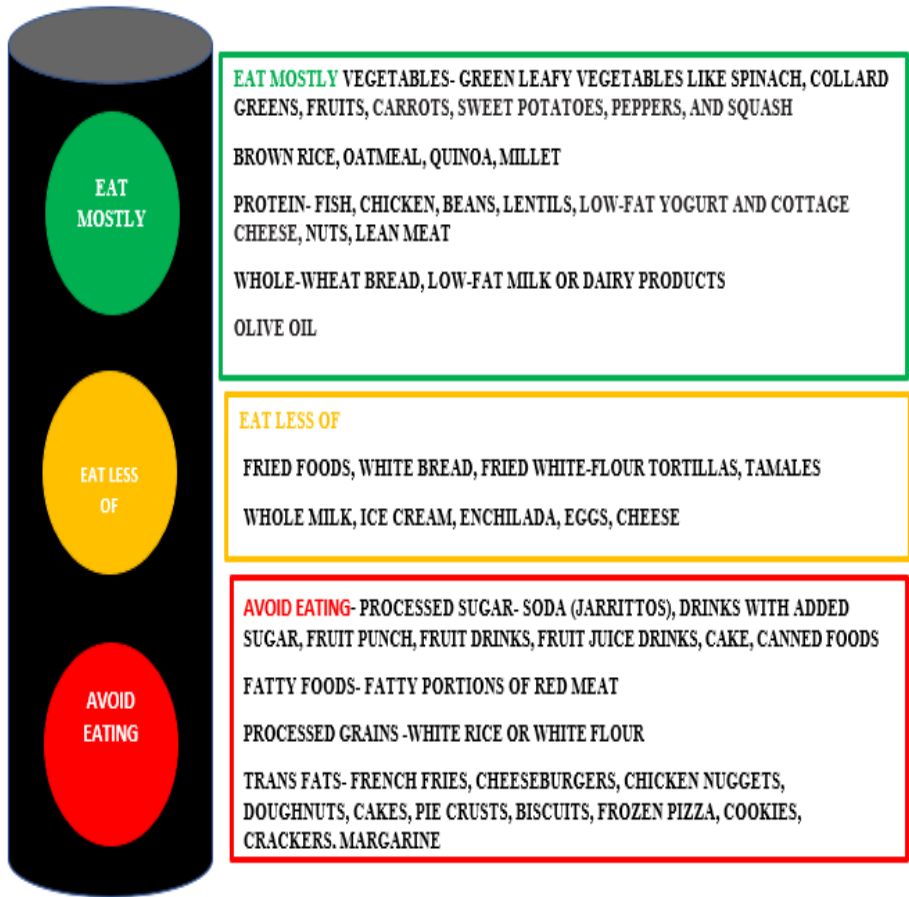
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### Appendix A

#### Culturally Sensitive “Traffic light” Food Choice Guide



**Appendix B**  
**Validated Instrument – DSMQ**

Diabetes Self-Management Questionnaire (DSMQ)

**The following statements describe self-care activities related to your diabetes. Thinking about your self-care over the last 8 weeks, please specify the extent to which each statement applies to you.**

	<b>Applies to me very much</b>	<b>Applies to me to a considerable degree</b>	<b>Applies to me to some degree</b>	<b>Does not apply to me</b>
1. I check my blood sugar levels with care and attention. <input type="checkbox"/> <i>Blood sugar measurement was not required as a part of my treatment.</i>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
2. The food I choose to eat makes it easy to achieve optimal blood sugar levels.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
3. I keep all doctors' appointments recommended for my diabetes treatment.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
4. I take my diabetes medication (e. g. insulin, tablets) as prescribed. <input type="checkbox"/> <i>Diabetes medication / insulin was not required as a part of my treatment.</i>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
5. Occasionally I eat lots of sweets or other foods rich in carbohydrates.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
6. I record my blood sugar levels regularly (or analyze the value chart with my blood glucose meter). <input type="checkbox"/> <i>Blood sugar measurement was not required as a part of my treatment.</i>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
7. I tend to avoid diabetes-related doctors' appointments.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
8. I do regular physical activity to achieve optimal blood sugar levels.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0

**The following statements describe self-care activities related to your diabetes. Thinking about your self-care over the last 8 weeks, please specify the extent to which each statement applies to you.**

	<b>Applies to me very much</b>	<b>Applies to me to a considerable degree</b>	<b>Applies to me to some degree</b>	<b>Does not apply to me</b>
9. I strictly follow the dietary recommendations given by my doctor or diabetes specialist.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
10. I do not check my blood sugar levels frequently enough as would be required for achieving good blood glucose control. <input type="checkbox"/> <i>Blood sugar measurement was not required as a part of my treatment.</i>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
11. I avoid physical activity, although it would improve my diabetes.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
12. I tend to forget to take or skip my diabetes medication (e. g. insulin, tablets). <input type="checkbox"/> <i>Diabetes medication / insulin was not required as a part of my treatment.</i>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
13. Sometimes I have real 'food binges' (not triggered by hypoglycemia).	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
14. Regarding my diabetes care, I should see my medical practitioner(s) more often.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
15. I tend to skip planned physical activity.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
16. My diabetes self-care was poor.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0

Appendix C

**Diabetes Self-Management Education Handout**

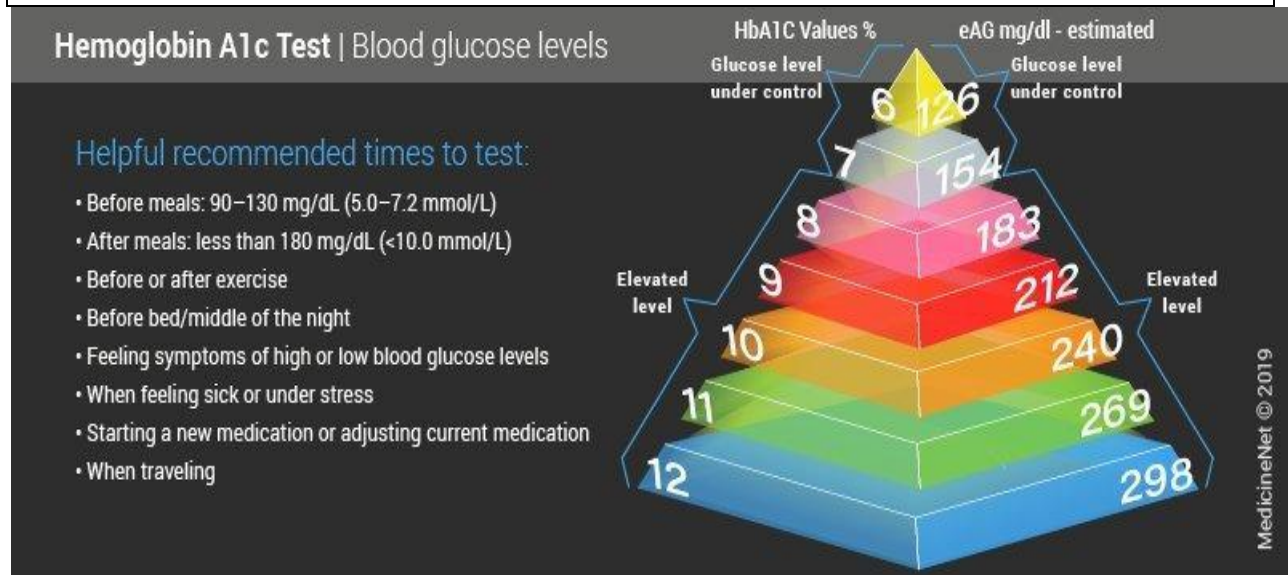


**Normal Blood glucose- Before a meal -80 to 130 mg/dL. Diabetes- A Hemoglobin A1c (Hb A1c) level greater than or equal to 6.5**

**Exercise- 30 minutes at least three times every week. Check your blood glucose prior to exercise. Snack before exercise. Exercise can include brisk walking, jogging, running, riding bicycles, playing basketball, soccer, baseball, dance- Zumba**

**Food- Eat mostly vegetables, fruits (vitamins) and protein. Avoid high carbohydrates and processed sugar**

**Medication-Bring your medications in their prescription bottles to all doctor visits. Take medications as prescribed. Follow the health care provider’s instructions and notify the health care provider of any significant side effects from medications.**



<https://www.cdc.gov/diabetes/managing/manage-blood-sugar.html>

**Lippincott Advisor for Education-** <https://advisor-edu.lww.com/lna/document.do?bid=4&did=1064770>



Appendix D

Asthma Action Plan to Demonstrate “traffic light” Colors

**Asthma Action Plan** Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Doctor's Name: \_\_\_\_\_ Main Emergency Contact: \_\_\_\_\_  
 Doctor's Phone Number: \_\_\_\_\_ Backup Emergency Contact: \_\_\_\_\_

**Red Zone: EMERGENCY!** Very short of breath, or quick-relief medicines have not helped, or symptoms are the same or worse after 24 hours in the Yellow Zone. Or, if you cannot do any of your usual activities.

**Severe Symptoms Emergency**

Take this medicine	How much to take		
(Quick-relief)	_____ Puffs Can repeat every ____ minutes, up to ____ times	<b>OR</b>	<input type="checkbox"/> Nebulizer: Can repeat every ____ minutes, up to ____ times
(Oral steroid)	Take _____ mg.		

**After you take your medicine, call your doctor right away!**  
 If you're still in the Red Zone after 15 minutes and have not reached your doctor, go to the hospital or call 911!

If you have these **DANGER SIGNS**: trouble walking or talking due to shortness of breath or your lips or fingernails are blue, pale, or gray, take \_\_\_\_\_ puffs of your quick-relief medicine and **GO to the hospital or call 911 NOW!**

These **DANGER SIGNS** mean you need help right away. Don't wait to hear back from your doctor.  
**GO to the hospital or call 911 NOW!**

If you use a peak flow meter you can use these scores to determine your current zone:

Your best score	Your green zone	Your yellow zone	Your red zone
_____	_____ or higher (80% of best score)	_____ to _____ (50 to 80% of best score)	_____ or lower (50% of best score)

Source: [CDC Asthma Action Plan](#)







Appendix E

Traffic Light Wellness Recovery Action Plan (WRAP)

Wellness Recovery Action Plan (WRAP)

Traffic Light

WRAP® is a mental health recovery education curriculum authored by Mary Ellen Copeland. This "Traffic Light" handout was created as a visual illustration of Action Planning during different stages of health. Please visit [www.mentalhealthrecovery.com](http://www.mentalhealthrecovery.com) to learn more about WRAP®.


	<b>Daily Maintenance Plan:</b> This is a description of what I am like when I am well. It includes a list of 3-5 things I can do each day which are most important to my wellness.
	<b>Triggers &amp; Action Plan:</b> These are events or circumstances that may make us feel different than we usually feel. The Action Plan is a list of things we can do when we experience triggers to help us feel better.
	<b>Early Warning Signs &amp; Action Plan:</b> These are subtle signs of change indicating we may need to take action before they worsen. Early Warning Signs can only be measured by the person experiencing them. We also need an Action Plan for Early Warning Signs.
	<b>When Things Are Breaking Down &amp; Action Plan:</b> Despite our best efforts, things may progress to the point where they are very serious. This is an important time and we need to take immediate action to prevent a crisis. An Action Plan is needed.
	<b>Crisis Plan:</b> In spite of your best planning and assertive action on your own behalf, you may find yourself in a situation where others will need to take responsibility for our care. It is important to have a plan that you can share with your supporters.
	<b>Post Crisis Plan:</b> This part of the plan is different because it is constantly changing as you heal. For example, you may feel much better two weeks after a crisis than just one week after a crisis. Therefore, your action plan for daily activities may change.
<a href="http://www.sacredcreations.org">www.sacredcreations.org</a>	<b>The goal of Action Plans is to get back to "Me Well."</b>

Inspired by Nanette Larson, developed and designed by Amy Foster and AJ French.

Wellness Recovery Action Plan (WRAP)

Traffic Light

WRAP® is a mental health recovery education curriculum authored by Mary Ellen Copeland. This "Traffic Light" handout was created as a visual illustration of Action Planning during different stages of health. Please visit [www.mentalhealthrecovery.com](http://www.mentalhealthrecovery.com) to learn more about WRAP®.

	Daily Maintenance Plan:
	Triggers & Action Plan:
	Early Warning Signs & Action Plan:
	When Things Are Breaking Down & Action Plan:
	Crisis Plan:
	Post Crisis Plan:
<a href="http://www.sacredcreations.org">www.sacredcreations.org</a>	<b>The goal of Action Plans is to get back to "Me Well."</b>

Inspired by Nanette Larson, developed and designed by Amy Foster and AJ French.

Source: [wrap.trafficlighthandout3\(pathways2promise.org\)](http://wrap.trafficlighthandout3(pathways2promise.org))

## Appendix F

### Hierarchy Table

*Table 1.0 Hierarchy Table of Evidence*

Melnyk Level	Evidence 1 (Hildebrand et al., 2020)	Evidence 2 (Burner et al., 2018)	Evidence 3 (Reininger Et al., 2020)	Evidence 4 Talavera et al., 2021)	Evidence 5 (Glantz et al ., 2020)	Evidence 6 (Robinson et al., 2019)
I	X					
II			X	X		
III						
IV		X			X	
V						
VI						X
VII						

Note. Selected studies, classified by the level of evidence using the Melnyk System of Hierarchy of Evidence for Intervention (2019).

**Appendix G**

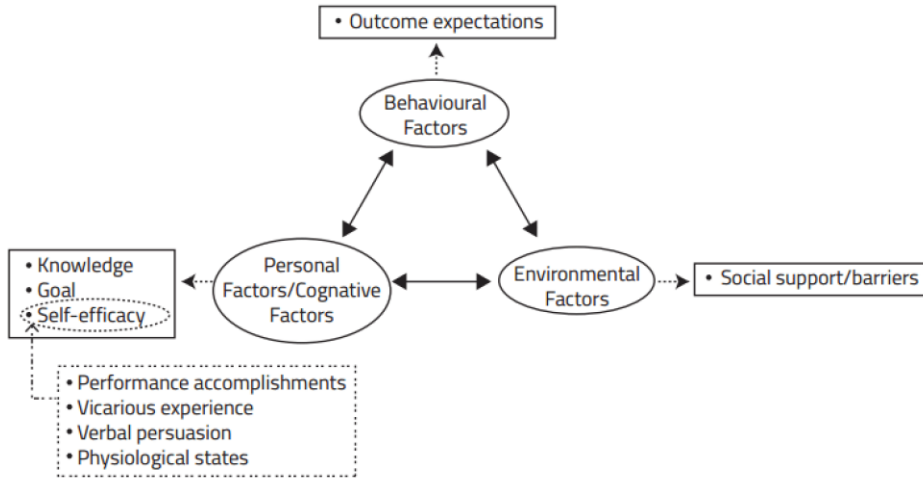
**Intervention Table**

*Table 2.0 Intervention Table*

Intervention details	Evidence 1 (Hildebrand et al., 2020)	Evidence 2 (Burner et al., 2018)	Evidence 3 (Reininger et al., 2020)	Evidence 4 (Talavera et al., 2021)	Evidence 5 (Glantz et al., 2020)	Evidence 6 (Robinson et al., 2019)
DSME intervention	X					
Text-MED, FANS, Mailed pamphlet of same information (control)		X				
Integrated team-based care intervention			X	X		
Insurance status					X	
Alphabet strategy- (AS)						X

**Appendix H**

**Social Cognitive Theory Model**



**Social Cognitive Theory** Albert Bandura 1989

Retrieved from <https://www.besci.org/models/social-cognitive-theory>

**Appendix I**

**Statement of Mutual Agreement**

**Eastern Kentucky University  
 Doctor of Nursing Practice (DNP) Program  
 Statement of Mutual Agreement**

The purpose of this document is to describe the nature of the agreement for the Doctor of Nursing Practice (DNP) Project between:

**Student Name: JANET MAKORI**

**Partnering Organization Name: MISSION ARLINGTON MEDICAL CLINIC**

This statement of mutual agreement is completed in the DNP Project planning phase as a precursor to the Institutional Review Board (IRB) and to show general organizational support for the DNP Project.

General Information:

DNP Project Title:	<b>Improving Self-Management of Diabetes with Culturally Sensitive Interventions</b>
Partnering Organization:	MISSION ARLINGTON MEDICAL CLINIC  210 W. South St., Arlington, TX 76010.
Preceptor	ANDREA WILSON, CFNP

Brief Description of the Project:

Identified Problem/Gap:	Poor management of diabetes among adults.
Proposed Intervention(s):	Improving Self-Management of Diabetes with Culturally Sensitive Interventions- "Traffic light" culturally sensitive food guide.
Proposed Evaluation of: <ul style="list-style-type: none"> <li>● Outcomes</li> <li>● Process</li> </ul>	Decrease in average blood glucose, A1C. Decrease in weight and waist circumference, better healthy food selection using a "traffic light" culture appropriate food selection guide.
Description of On-Site Activities: <ul style="list-style-type: none"> <li>● Student's Role</li> <li>● Meetings</li> <li>● Access to Data</li> </ul>	Review charts to select patients previously diagnosed with diabetes. Meet with patients during triage or during visit to review diabetes management materials including culture appropriate stop light food selection guide, check vital signs, blood glucose, A1C, waist circumference. Patient visits/ follow up phone calls- At least four times- weekly. Student will be present at the site more than 6 times to implement study.
Intellectual Property: <ul style="list-style-type: none"> <li>● Ownership</li> <li>● Plans for Dissemination</li> <li>● Non-disclosure</li> </ul>	Student will have ownership of study results and rights to publication as authorized by organization.  All patient information will be de- identified.

Appendix I

Statement of Mutual Agreement

expectations • Publication Plans	*** All EKU DNP Projects will require at minimum a de-identified abstract to be uploaded into the digital repository as a marker of academic work.
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Institutional Review Board:

EKU is the IRB of Record	The organization agrees to let EKU be the IRB of Record. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other: (Explain) <input type="checkbox"/>
Organization is the IRB of Record	The organization prefers to be the IRB of Record. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Other: (Explain)

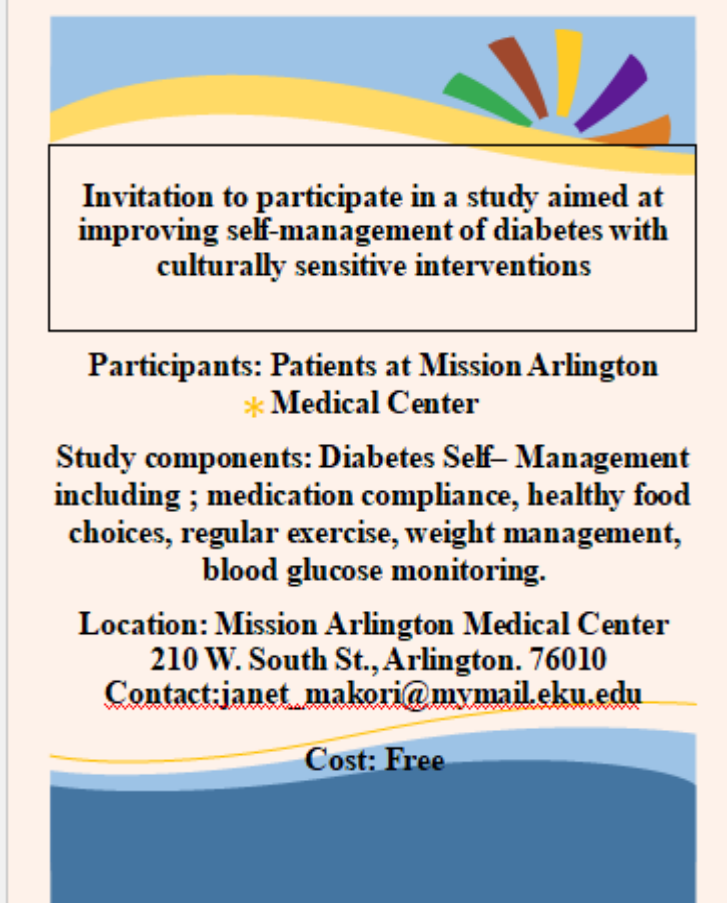
Other elements for clarification prior to implementation of the DNP Project. Describe.

DNP Student Signature: *Justina*  
 Date: 4/26/2022

Partnering Organization's Signature: *Andrew*  
 Date: 4/26/2022



**Appendix J**  
**Recruitment Flyer**



The flyer features a decorative header with a blue sky, a yellow sun, and colorful rays. The main text is enclosed in a white box with a black border. Below the box, the text is centered and includes details about participants, study components, location, contact information, and cost. The footer has a blue wavy background.

**Invitation to participate in a study aimed at improving self-management of diabetes with culturally sensitive interventions**

**Participants: Patients at Mission Arlington  
\* Medical Center**

**Study components: Diabetes Self- Management including ; medication compliance, healthy food choices, regular exercise, weight management, blood glucose monitoring.**

**Location: Mission Arlington Medical Center  
210 W. South St., Arlington. 76010  
Contact: [janet\\_makori@mymail.eku.edu](mailto:janet_makori@mymail.eku.edu)**

**Cost: Free**



**Appendix K****Demographics Questionnaire**

1. What was your age group?  
 18 -25    25 - 35    35 - 45    45 - 55    56 - 65    65+
2. Have you been diagnosed with diabetes?  Yes    No
3. What was your preferred language for communication?
4. Do you have transportation means to the clinic?  Yes    No
5. What was the biggest challenge you have with your health condition?
  
6. Who are the other family members (spouse, siblings, children, relatives) or friends that can help you manage your health?

**Appendix L****Budget**

ITEM	TIME/COST BREAKDOWN	TOTAL ESTIMATE
Direct labor – Individuals interacting with patients, printing materials and documenting outcome.	15 minutes (T) per patient T in hours- $15 \times 4 = 1$ hour for 4 patients 4 pts per hour 50 pts per 12.5 hours Cost (C) per 15 minutes - \$10 Cost per hour = $10 \times 4 = \$40$ 50 patient= 12.5 hours x \$40	<b>\$500</b> Per week for 50 patients receiving intervention once a week.
Direct material/ Stationery	Printing paper – 1 ream= \$20 Pencils- 1 dozen = \$5 Pens- 1 dozen = \$5 Printer toner = \$100 Binders/Folders \$20 Posters x5 @ \$15= \$75	<b>\$225</b>
Utilities- at facility	Electricity, water consumption, Phone – handset \$ 100 per month	<b>\$100</b>
Office space	Shared office space- \$100 per month	<b>\$100</b>
Travel – Personnel implementing project	Fuel- \$ 10 per individual \$50 for 5 individuals	<b>\$50</b>
Miscellaneous		<b>\$200</b>
<b>TOTAL</b>		<b>\$1,175</b>

Appendix M

Qualitative Table Showing Outcome

	Participants given traffic light food guide (TLFG) and DSME handout Asked about Challenge managing diabetes	1st week follow up Patients asked about Challenge managing diabetes  Asked about progress using the traffic light food guide	2 <sup>nd</sup> week follow up	3 <sup>rd</sup> week follow up
1	Poor diet, not taking meds	+Using TLFG for food selection +Eats more vegetables + Got med refills – taking meds daily	Did not answer phone	+Using TLFG for food selection +More vegetables and walking daily – 30 m
2	Skipping meds, eats a lot of bread.  “I don’t understand diabetes”	+Using TLFG for food selection +Taking insulin & oral diabetes meds, exercising daily. Reduced bread	+Using TLFG for food selection +Eating more veges, better understands healthy foods	+Using TLFG for food selection +Used to taking insulin eating healthy snacks nuts
3	Nothing	+Using TLFG for food selection +Eating healthy, more protein	Did not answer phone	Did not answer phone
4	Poor diet- “ I eat a lot of potatoes.” Stopped taking medication months ago	+Using TLFG for food selection +Got medication refills, getting help from son	+Using TLFG for food selection +“No mas papas” No more potatoes	+Using TLFG for food selection +Exercising two times Eating more beans instead of red meat
5	“jarritos” (Sodas)	+Using TLFG for food selection +Stopped drinking sodas, drinking mostly water and tea. Eats more veges	+Using TLFG for food selection +Drinking mostly water and tea. +Eats more veges. +Exercises	+Using TLFG for food selection +No more sodas. Drinking water. Feeling good. +Eating more veges
6	Forgets medication sometimes	+Using TLFG for food selection +Using a pill box. Eating salads for lunch mostly and healthy breakfast. +Set alarm for medication	+Using TLFG for food selection +Still using pill box and alarm for meds. +No fast food.	+Using TLFG for food selection +Walking with sister sometimes for 30-40 minutes

7	Lack of exercise	<u>+Did not answer call</u>	<u>+Doing exercise at home per YouTube.</u> <u>+Eating mostly vegetables and grilled chicken</u>	<u>+Walks some evenings, exercises at home when cold outside.</u>
8	Poor diet No transportation to appointments	<u>+Using TLFG for food selection</u> <u>+“Trying to eat better”</u> <u>Eating more vegetables and white meat.</u>	<u>+Did not answer the phone.</u>	<u>+Using TLFG for food selection</u> <u>+Has discovered more healthy recipes on YouTube</u>
9	None	<u>+Using TLFG for food selection</u> <u>+Eating less jollof rice, eating more fish instead of pork. Walking in the evenings</u>	<u>+Using TLFG for food selection</u> <u>+Makes fruit smoothies for breakfast. Avoiding sodas</u>	<u>+Using TLFG for food selection</u> <u>+Avoiding sodas, drinking more water.</u>
10	Loves sweets and fried food. Less vegetables	<u>-Did not answer the phone.</u>	<u>-Did not answer the phone.</u>	<u>-Did not answer the phone.</u>
11	Does not understand food groups (high versus low carbohydrate) Eats a lot of pastry and chicken	<u>+Has a picture of TLFG on phone.</u> <u>+Talks to family members about better food choices.</u> <u>Eating more fruits</u>	<u>+Avoids fast food.</u> <u>+Using TLFG for food selection</u> <u>+Cooking more and doing meal prep</u>	<u>+Continuing to exercise to eat healthier.</u> <u>+Using TLFG for food selection</u>
12	Nothing	<u>+Eating salads sometimes.</u>  <u>+Drinking plenty of water</u>	<u>+Following the food guide sometimes.</u>	<u>-Ran out of medication. Will call for refills</u>
13	Lack of diabetes medication refill	<u>+Refilled meds for 90 days.</u> <u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u> <u>+Using pill box</u>	<u>+Using TLFG for food selection</u>
14	Lack of exercise. Eats late at night due to night shift. Eats “anything” to stay awake at work.	<u>+Using TLFG for food selection</u>  <u>+Doing healthy meal preps</u>	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u>

15	“Eating too much jollof rice”	+Using TLFG for food selection  +Tried brown rice	+Using TLFG for food selection  +Substituted white rice with brown rice and sweet potatoes	+Using TLFG for food selection
16	None	-Did not answer phone	-Did not answer phone	-Did not answer phone
17	none	+Using TLFG for food selection  +Eating more green leafy vegetables. Avoiding sodas	+Using TLFG for food selection  +Taking BP and Diabetes medication daily	+Using TLFG for food selection  +Added walks to routine  Does not like exercising when its cold
18	Eats white bread and rice daily	-Did not answer phone	+Using TLFG for food selection	+Using TLFG for food selection
19	Eats out mostly due to work schedule	+Cooking at home at least two times a week. +Using TLFG for food selection	+Using TLFG for food selection.  +Exercising for 30 minutes on off days	-Did not answer phone
20	None	+Using TLFG for food selection	+Using TLFG for food selection	+Using TLFG for food selection
21	None	+Using TLFG for food selection	+Using TLFG for food selection	+Using TLFG for food selection
22	None	+Using TLFG for food selection	+Using TLFG for food selection	+Using TLFG for food selection
23	“ I should eat more vegetables”	+Using TLFG for food selection  +Eating more fruits and vegetables	+Using TLFG for food selection	+Using TLFG for food selection
24	None	-Did not answer phone	-Did not answer phone	-Did not answer phone
25	None	+Using TLFG for food selection  +Eating more fruits and vegetables	+Using TLFG for food selection	+Using TLFG for food selection
26	None	+Using TLFG for food selection	+Using TLFG for food selection	+Using TLFG for food selection
27	“I like bread”	+Using TLFG for food selection  +Stopped buying bread	+Using TLFG for food selection  +Exercising twice a week when off	+Using TLFG for food selection  +Drinks water, exercise couple of times a week

28	None	<u>+Using TLFG for food selection</u> <u>+Avoiding biryani and paratha</u>	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u>
29	None	<u>+Using TLFG for food selection</u> <u>+Avoiding fried foods.</u> <u>Drinks a lot of water</u>	<u>+Using TLFG for food selection</u> <u>+Eating more vegetables and fruits</u> <u>+Goes on walk in the evenings</u>	<u>+Using TLFG for food selection</u> <u>+Eating more vegetables and fruits</u> <u>+Goes on walk in the evenings</u>
30	None	-Did not answer phone	-Did not answer phone	-Did not answer phone
31	Forgets to take medication. Does not like to exercise	<u>+Using TLFG for food selection</u> <u>+Using pill box and alarm clock for medication times.</u> <u>-Does not like to exercise</u>	<u>+Using TLFG for food selection</u> <u>+Using pill box and alarm clock for medication times</u>	<u>+Using TLFG for food selection</u> <u>+Using pill box and alarm clock for medication</u>
32	No exercise and eats anything that is cooked at home.	<u>+Using TLFG for food selection</u> <u>+Family is eating healthier- mostly grilled foods with less fat</u>	<u>+Using TLFG for food selection</u> <u>+Family trying new healthier recipes</u>	<u>+Using TLFG for food selection</u>
33	None	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u>
34	Does not like vegetables	<u>+Using TLFG for food selection.</u> <u>+Does home exercise sometimes.</u> <u>+Eating more lean meat and fruits</u> <u>+Taking meds as scheduled</u>	<u>+Using TLFG for food selection</u> <u>+Eating more lean meat and fruits</u> <u>+Exercises sometimes</u>	<u>+Using TLFG for food selection</u> <u>+Eating more meat and fruits</u> <u>+Exercises sometimes</u>
35	None “ I only eat once a day by choice. I don’t believe I have diabetes.”	N/A Refused at follow up	N/A	N/A
36	None	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u>

		<u>+Doing healthy meal prep</u> <u>+Walking three times a day</u>	<u>+Doing healthy meal prep</u> <u>+Walking three times a day</u>	<u>+Doing healthy meal prep</u> <u>+Walking three times a day</u>
3 7	None	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u>
3 8	Poor diet, eats mainly chicken and potatoes.	<u>+Using TLFG for food selection</u> <u>+Eats more vegetables.</u> <u>+Goes to the apartment gym twice a week</u>	<u>+Using TLFG for food selection</u> <u>+Goes to the apartment gym twice a week</u>	<u>+Using TLFG for food selection</u> <u>+Avoiding potatoes, more home cooked m</u>
3 9	Ran out of medication, does not have a ride, no insurance, no refills	<u>+Using TLFG for food selection.</u> <u>+Got medication refills, taking insulin twice a day.</u>	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u> <u>+Eating more beans</u>
4 0	None “ I eat mainly African food like rice, fish and puff puff”  Puff puff-doughnut	<u>+Using TLFG for food selection</u> <u>+Understands healthy food options.</u>	<u>+Using TLFG for food selection</u> <u>+Stopped making puff puff. Eats wheat bread twice a week</u>	<u>+Using TLFG for food selection</u>  <u>+Eats grilled foods m</u>
4 1	None- Doing well with management of health	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u> <u>+Walking three times a week</u>	<u>+Using TLFG for food selection</u> <u>+Has not been able to exercise due to cold v</u>
4 2	Legally blind, unable to prepare food and insulin. Eats anything available whenever hungry	<u>+Unable to read TLFG but tries to eat healthy snacks like nuts and saltin crackers</u>	<u>+Received insulin drawn up at clinic for a month.</u> <u>+Unable to take walks due to safety</u>	<u>+Drinking water inst juice.</u> <u>+Using refilled insu syringes.</u>
4 3	None	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u>	<u>+Using TLFG for food selection</u>
4 4	None	<u>+Using TLFG for food selection</u>  <u>+Started playing soccer once a week with friends</u>	<u>+Using TLFG for food selection</u>  <u>+Eating more salad. Reduced alcohol</u>	<u>+Using TLFG for food selection</u>  <u>+Eating healthier, d more water</u>

**Green**- Patients verbalized using the traffic light food guide.

**Gray**- Patients verbalized changes in food choices.

**Red**- Patients verbalized medication use for managing diabetes.

**Black** -Patient verbalized exercising.

**Yellow**- No answer

**Positive (+) sign, *Italicized, underlined*- Positive outcome at follow up.**  
**Negative (-) sign- No change or negative outcome at follow up.**



