Type Two Diabetes Management in the Latino Community

Valerie Bass, BSN, RN and Brenda Cooper BSN, RN

Doctor of Nurse Anesthesia Program, AdventHealth University

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Dr. Amanda Bracken

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Abstract

The Latino community makes up 31.1% of the population in the Central Florida region, and is disproportionately affected by diabetes mellitus (DM) (U. S. Census Bureau, 2019). Proper glycemic control is pivotal to the surgical management of this patient population. Poorly controlled glycemic levels impact the perioperative state and are associated with an increased risk of surgical site infection, embolic events, poor wound healing, postoperative nausea and vomiting, sepsis, and death. There is also an increased risk of further organ damage, such as end-stage renal disease, affecting medication metabolism and excretion (Dreisbach et al., 2009). Type 2 diabetes mellitus (T2DM) patients have shown to have similar surgical outcomes as their non-diabetic counterparts with proper glycemic management (Dagogo-Jack & Alberti, 2002; Tidy & Cox, 2016; Wukich, 2015). Previous quantitative improvement initiatives show a direct correlation between culturally tailored diabetes self-management education (DSME) and a reduction in hemoglobin A1C (HbA1C) (Brown et al., 2011; Chrvala et al., 2016; Fortmann et al., 2017; Garcia et al., 2015; Hildebrand et al., 2020; Hu et al., 2016; Palmas et al., 2014; Pérez-Escamilla et al., 2014; Rosal et al., 2011; Rotberg et al., 2016; Spencer et al., 2018; Weinstock et al., 2011). While this correlation has been proven, no improvement projects found utilized education primarily through an online format nor include an educational focus on disease management's long-term impact. Due to stated deficits, a quantitative improvement project was formulated to address the shortcomings and assess the correlation between DSME and HbA1C.

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More than half of the diabetic population will need one or more surgeries in their lifetime. The metabolic changes created by surgery place these patients at a greater risk of experiencing complications. Poorly controlled glycemic levels, HbA1C >7%, in diabetic surgical patients are associated with increased risk of infection, embolic events, sepsis, and death (Dagogo-Jack & Alberti, 2002; Kotagal et al., 2015; Tidy & Cox, 2016; Wang et al., 2019; Wukich, 2015). A HbA1C <7% has proven to have a lower 5-year mortality rate following surgery (Duggan et al., 2017; Wang et al., 2019). DSME improves HbA1C, particularly in the Latino community (Brown et al., 2011; Hu et al., 2016; Rosal et al., 2011; Spencer et al., 2018). In the Central Florida region, where the Latino community makes up 31.1% of the population, DSME may be vital in improving surgical outcomes (Brown et al., 2011; Florida Health, 2019; Hu et al., 2016; Rosal et al., 2011; Spencer et al., 2018).

Significance and Background of Clinical Problem

The United States has the highest prevalence of DM consisting of 34.2 million people, with minorities being disproportionately affected (Centers for Disease Control and Prevention [CDC], 2020b; Fortmann et al., 2017). The Latino community experiences higher rates of DM at 12.1% and shows poor glycemic control, higher incidence of diabetes-related comorbidities, and increased mortality (CDC, 2020a; Fortmann et al., 2017; Palmas et al., 2014; Pérez-Escamilla et al., 2015; Rosal et al., 2011; Spencer et al., 2018). For the certified registered nurse anesthetist (CRNA) working with this demographic, DM management is vital due to the surgical complications that can arise, such as poor wound healing, postoperative nausea and vomiting, delayed extubation, ischemic events, and increased mortality (Dagogo-Jack & Alberti, 2002; Wang et al., 2019).

DSME provided in a culturally tailored manner is directly correlated to a decrease in HbA1C and improved knowledge (Brown et al., 2011; Hu et al., 2016; Rosal et al., 2011; Spencer et al., 2018). However, ease and disruption of patient participation and continuous access to education are constant limitations (Brown et al., 2011; Fortmann et al., 2017; Garcia et al., 2015; Hu et al., 2016; Palmas et al., 2014; Pérez-Escamilla et al., 2014; Rosal et al., 2011; Rotberg et al., 2016; Spencer et al., 2018; Weinstock et al., 2011). As patient access to care and education material is a continuous deficit for this demographic, the intended purpose of this quantitative improvement project was to fill the gap between the underserved Latino diabetic consumer and culturally tailored resources. This project offered online education to adult Latinos with T2DM and evaluated the participants' retention of knowledge along with self-reported HbA1C levels within a three-month period.

PICOT Evidence Review Questions

In Problem Intervention Comparison and Outcome (PICO) format, two questions guided a systematic review of the literature and assisted in the innovation formulation. The first question addressed a clinical problem, and the second question drove the education innovation.

1. In adult Latinos with type 2 diabetes (P), how does education for self-management of the individual's diabetes (I) affect glycemic control (O)?

2. In a three-month period (T), do adult Latinos with type 2 diabetes at All Florida Family & Sports Medicine clinic (P) experience retention of knowledge, and a decrease in HbA1C (O) in contrast to their baseline knowledge and HbA1C (C) when provided interactive education on diet, exercise, long-term effects, and blood glucose management (I)?

Search Strategy/Results

The search strategy included three electronic databases: The US National Library of Medicine, PubMed, and CINAHL. A total of 62 articles were initially retrieved, of which 10 met the criteria. After reviewing the articles' titles and abstracts, articles not clearly defining ethnicity, not performed in the United States, and not focusing on education were excluded. Key search terms included: Latino OR Hispanic AND education AND type 2 diabetes AND HbA1C OR glycemic control OR A1c. MESH terms included: adult, Hispanic Americans, diabetes mellitus, Type 2 / blood. Search limits included the following: published within ten years, English, United States, adult, abstract available, linked full text, peer-reviewed, and human participant.

GRADE Criteria

The quality of the literature regarding T2DM management was evaluated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) criteria. The initial GRADE level was high four, as the involved studies were predominantly randomized control trials with two quasi-experimental designs. The material was graded down one for risk of bias as all the studies had a high level of attrition. Not all were double-blinded, nor did they specify how they retrieved their lab values. The body of literature was also graded down one for lack of directness. Multiple studies involved phone call or text message programs that could not adequately count participant interaction. Therefore, the GRADE level was decreased to low two. However, the literature was subsequently increased to a moderate three due to the large magnitude of effect in which all studies showed a decrease in overall HbA1C in a three-month time frame. Based on the quality of evidence available and the high magnitude of effect, a high recommendation can be made to implement culturally tailored DSME to improve HbA1C.

Literature Review and Synthesis of Evidence

This literature review includes a description of all operational definitions, theoretical framework, and literature review. Topics discussed in the literature review include a) depth of impact of T2DM on the Latino population in the United States, b) the type of information utilized for DSME, c) the impact of DSME on HbA1C, blood pressure, lipid panels, weight or body mass index, and diabetes-related knowledge, and d) inconsistencies found throughout the reviewed literature.

Operational Definitions and Objectives

Diabetic Self-Management Education

Diabetic self-management education is education provided in a culturally tailored manner on how to manage diabetes and the correlated conditions. The objective of DSME is reducing HbA1C levels, preventing or minimizing diabetic complications, improvement in quality of life, and lowering overall medical expenses. DSME focuses on meeting these outcomes by administering personalized education (CDC, 2018).

Latino

For this improvement project, *Latino* is defined as any individual self-identifying having Latino heritage. The Latino demographic has been selected as it is heavily represented in the Central Florida area. Approximately 7.2% of Florida's Latino population are diabetic, and a deficit has been identified in the availability of intervention (Florida Health, 2019).

HbA1C

HbA1C is a blood test that can provide a picture of glycemic control over the previous 90 days, with the normal range of 4%-5.6%. HbA1C has been chosen as the primary measurement

because of its ability to depict diabetic control. It is primarily used as a tool to judge how well an outlined treatment plan is working (American Diabetes Association, 2021).

Literature Review

The Latino demographic is the fastest-growing minority group in the United States, currently comprising 17.1% of the total population, and is disproportionately affected by T2DM (Fortmann et al., 2017; Palmas et al., 2014; Pérez-Escamilla et al., 2015; Rosal et al., 2011; Rotberg et al., 2016; Spencer et al., 2018). The Latino community faces multiple obstacles in acquiring medical care, including inadequate access to health insurance, lower socioeconomic status, and lack of health-related knowledge (Brown et al., 2011; Palmas et al., 2014; Rotberg et al., 2016; Weinstock et al., 2011). DSME presented in a culturally sensitive manner has shown to bridge this socioeconomic gap, decrease HbA1C, and increase overall diabetic knowledge (Brown et al., 2011; Hu et al., 2016; Rosal et al., 2011; Spencer et al., 2018).

Education Utilized

The primary methodology employed for the delivery of DSME was in-person education by healthcare workers, most commonly during home visits, while community centers and churches were used to a lesser extent for group education (Brown et al., 2011; Garcia et al., 2015; Hu et al., 2016; Palmas et al., 2014; Pérez-Escamilla et al., 2014; Rosal et al., 2011; Rotberg et al., 2016). Educational tools were based on recommendations from the American Diabetes Association and were culturally tailored to meet the needs of the Latino population (Brown et al., 2011; Fortmann et al., 2017; Garcia et al., 2015; Hu et al., 2016; Palmas et al., 2014; Pérez-Escamilla et al., 2014; Rosal et al., 2011; Rotberg et al., 2016; Spencer et al., 2018; Weinstock et al., 2011).

Outcomes and Results

The primary outcome was decreased HbA1C; secondary outcomes included effects on blood pressure, lipid panels, weight or body mass index, and diabetes-related knowledge. Outcomes were measured at three-month intervals with varying time frames ranging from three months to five years (Brown et al., 2011; Fortmann et al., 2017; Garcia et al., 2015; Hu et al., 2016; Palmas et al., 2014; Pérez-Escamilla et al., 2014; Rosal et al., 2011; Rotberg et al., 2016; Spencer et al., 2018; Weinstock et al., 2011). The most consistent finding was a decrease in overall HbA1C, directly correlated to patient attendance and active participation, with the greatest changes at three- and six-month intervals (Pérez-Escamilla et al., 2014; Rosal et al., 2011; Spencer et al., 2018). Past these time frames, changes in HbA1C lost clinical significance. The only secondary outcome consistently identified as positively impacted by the provided education was the retention of diabetes knowledge (Brown et al., 2011; Fortmann et al., 2017; Garcia et al., 2015; Hu et al., 2016; Palmas et al., 2014; Pérez-Escamilla et al., 2014; Rosal et al., 2011; Rotberg et al., 2016; Spencer et al., 2018; Weinstock et al., 2011).

Inconsistencies and Deficits

Although there was a notable decrease in HbA1C in participants that attended in-person education, significant attrition rates were the most common limitation (Brown et al., 2011; Fortmann et al., 2017; Garcia et al., 2015; Hu et al., 2016; Palmas et al., 2014; Pérez-Escamilla et al., 2014; Rosal et al., 2011; Rotberg et al., 2016; Spencer et al., 2018; Weinstock et al., 2011).

Applicability to Practice

Surgery can cause a metabolic stress response that negatively impacts pancreatic beta-cell function and impairs natural insulin function, which may be detrimental to a patient with a HbA1C >7% (Dagogo-Jack & Alberti, 2002; Kotagal et al., 2015; Wukich, 2015). The metabolic

stress response potentiates an increase in blood glucose, ketoacidosis, and hyperosmotic states, as well as dangerous electrolyte imbalances, and impaired wound healing (Dagogo-Jack & Alberti, 2002; Wang et al., 2019). Proper diabetic management can result in similar surgical outcomes as that of a non-diabetic patient. Surgical outcome improvements include a decrease in the prevalence of complications, future surgeries related to perfusion disorders, likelihood of infections, end-stage renal disease, and plaque buildup (Dagogo-Jack & Alberti, 2002, Wukich, 2015; Tidy & Cox, 2016). Diabetes management is of particular importance to the CRNA as the anesthetic plan may be complicated by electrolyte abnormalities, increased risk of cardiovascular disease, decreased gastrointestinal motility, impaired immune function, and diabetic kidney disease (Daryabor et al., 2020).

It was theorized that retention of T2DM knowledge and a decrease in HbA1C will improved when DSME is provided through an online format with the inclusion of long-term complications. It was also anticipated that providing education through an online format would alleviate attrition issues. This quantitative improvement project intended to expand upon the participant's baseline knowledge on diabetic management and its effect on body systems.

Methodology

Project Aims

The investigators aimed to improve diabetic knowledge and decrease HbA1C in a three-month time frame to prevent the negative impact of poor glycemic control. Three primary objectives were involved in this quantitative improvement project: identifying Latino patients attending the All Florida Family & Sports Medicine clinic in Kissimmee, Florida, with T2DM, measuring the participant's knowledge by providing one questionnaire administered at three

different times within the project period, and requesting that the participant's self-report their HbA1C levels at the beginning and end of the project for analysis.

Methods

After Scientific Review Committee (SRC) approval, a correlative quantitative approach was conducted using a single group of participants of Latino heritage with T2DM. This method aided in determining if the independent variable, education, affected the dependent variables of diabetic knowledge and HbA1C. The sample methodology was in a purposive sample format, as participants had to meet the inclusion criteria, which entailed self-identifying as Latino and having a diagnosis of T2DM. Exclusion criteria included any participant that does not speak English or Spanish, any participant who did not have access to the internet, and any participant deemed by their primary care physician to be unsafe to adopt proposed lifestyle changes.

The investigators used G*Power to conduct a priori power analysis to calculate the sample size. For a power of 0.80 with an alpha of 0.05 and a moderate 0.5 effect size, it was determined that a sample of 26 participants is needed. An additional 20% was added to account for attrition, bringing the total sample needed to 31 participants.

Participants were required to self-identify as meeting the outlined inclusion criteria with final approval to engage in this project by their primary care provider. Participants were recruited over eight weeks at the All Florida Family & Sports Medicine clinic; the project was presented through a recruitment flyer in English and Spanish at the check-in desk. The presented information included the type of participant desired, the expected outcomes, the type of education presented, and the requirements of computerized questionnaires. A quick response (QR) code and website was provided on the flyer with the next steps for the participant to take for project involvement. An email to contact the investigators was provided to the participants

through the voluntary participation form should any questions arise. Details on the knowledge assessment, how to access the educational content, and how to complete the project was provided through both the voluntary participation form and the recruitment flyer. No additional potential risks or vulnerable populations were identified in the formulation of this project. Benefits for participants included a decreased HbA1C and an increased understanding of the disease process and management through DSME.

HbA1C results were self-reported by participants. No identifying participant data was shared between the clinic staff and investigators. No identifying information was included in the final project presentation, nor any content divulged to anyone other than clinic staff and the investigators. Following approved participation by their primary care provider, participants were responsible for accessing the online content. All questionnaires and education were provided through an online format. The education included one fifteen-minute PowerPoint presentation with a voiceover. Participants accessed this content through the QR code or website provided on the recruitment flyer. Participants were asked to provide their phone number or email address but were able to choose their preferred method of contact for their reminder of the three-month post-questionnaire requirement. The participants were asked through the online questionnaire if they had been recently hospitalized since their last HbA1C. The diabetic knowledge questionnaire administered to the participants' included questions about general meal planning, proper glucose management, recommended activity levels, and long-term effects of poorly managed diabetes. The diabetic knowledge questionnaire was administered before education, directly after education, and at three months after education. The diabetic knowledge questionnaire was formulated based on content provided by the American Diabetes Association (ADA).

Face validation was completed by peer review in succession. Face validated content included, educational PowerPoint titled 'Diabetes & You', a recruitment flyer, and a ten question diabetic knowledge questionnaire. The content was reviewed by three student registered nurse anesthetists (SRNAs) currently enrolled in AdventHealth University's (AHU) doctor of nurse anesthesia practice (DNAP) program; an end-user who is a nurse practitioner of Latino heritage living with T2DM, and two faculty members of AHU's DNAP program. The last required reviewer was Mrs. Charlotte Henningson, an AHU faculty member outside of the DNAP program. Finally, all content was assessed for a Flesch-Kincaid score. The respective scores were as follows: ten diabetic knowledge questions, 60-fairly easy to read, recruitment flyer, 71-fairly easy to read, and educational PowerPoint, 73- fairly easy to read.

It was proposed that an AdventHealth statistician would use Statistical Package for the Social Sciences (SPSS) software version 21.0 to complete statistical analysis of the data. A correlation coefficient would be computed to assess for a relationship between the first and final HbA1C values as well as the first, second and final diabetic knowledge questionnaire results to determine knowledge retention using the traditional alpha value. The investigators exchanged all identifying information for a numbered system before statistical analysis by an AdventHealth statistician. Results were stored within a Microsoft teams' workspace that is password protected and automatically deleted after five years.

Planning and Procedures

Planning

Multiple key stakeholders were identified as vital in the progression and formulation of this project; all were selected based on their roles and applicability to the project. They were chosen as follows: Dr. Amanda Bracken, nurse anesthesia program faculty at AHU; Mrs. Magaly Hernandez, adjunct faculty at AHU specializing in nutrition; and Mr. Mohammed Khan, Nurse Practitioner at the All Florida Family & Sports Medicine clinic in Kissimmee, Florida.

Implementation

This project was implemented in the clinical setting in the spring of 2022. The content was delivered in English and Spanish through culturally tailored educational videos. A short questionnaire was made to assess the participants' understanding of the main points of the education. Recruitment took place over eight weeks. Participants were asked to self-report a HbA1C if they had one completed within the past three months. Participants created a personal identifier consisting of their mother's maiden name and the participants' favorite color. Participants took the questionnaire to assess baseline knowledge, watched the educational video, took the same questionnaire immediately after to assess for any new knowledge, and again at three months to evaluate for retention. At the three months follow-up, participants were asked to self-report any recent HbA1C measurements.

Barriers and Facilitators

The All Florida Family & Sports Medicine clinic acted as a facilitator throughout this process. Anticipated barriers included lack of access to the internet and comorbidities that may impact glycemic control. This project did not focus on any other comorbidities and the researchers acknowledge that results can be swayed from extenuating circumstances caused by

said comorbidities. The largest barrier anticipated was attrition. Participants were reminded via email or phone regarding the post-questionnaire.

Procedures to Sustain

To increase adherence with clinic staff, investigators met with Mr. Khan, clinic nurse practitioner, and clinic office manager. Flyers and educational content were reviewed with the clinic staff along with explanation of goals and anticipated findings. All questions were answered and recruitment flyers were strategically placed in the front check-in area, and given directly to Mr. Khan to be handed to participants during their previously scheduled appointments.

Project Timeline

A request for participation from key stakeholders was completed in June of 2021. Agreement to use the site for the project was attained by August 2021. A proposal was submitted to the SRC in October of 2021. Project implementation post data collection began with SRC approval in November 2021. Upon approval, participant selection began in the spring of 2022. The three-month time frame for completion continued through the summer of 2022. Analysis of all gathered quantitative findings was conducted in the fall of 2022. Dissemination was completed in the spring of 2023. Refer to Appendix F for the final timeline of the project.

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Results

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Due to poor attrition no meaningful data was collected, and statistical analysis was unable to be performed. Five individuals started the initial education and pre-questionnaire. Out of the five individuals, only one individual completed the required education and initial questionnaire. Two did not complete any of the pre-questionnaires, one individual only completed the initial questionnaire without the final questionnaire, and another did not self-identify as Latino. The one participant that completed the first questionnaire did not complete the three-month follow-up.

Discussion and Implications

The Latino community in Central Florida is disproportionately affected by poorly managed T2DM. Inadequate glycemic control leads to detrimental changes that lead to increased health risk and poor perioperative outcomes. The purpose of this project was to implement a culturally tailored DSME through an online format discussing T2DM management's long-term impact on the body. As well as assessing the correlation between DSME and HbA1C effects.

The innovation PICOT explored retention of knowledge and a decrease in HbA1C in adult Latinos with T2DM during a three-month period after being provided education on modifiable lifestyle choices. The independent variable of education was assessed for its impact on the dependent variables of diabetic knowledge and HbA1C. The investigators aimed to improve diabetic knowledge and decrease HbA1C in a three-month time to prevent the negative impacts of poor glycemic control. Three primary objectives were instituted, these included identifying Latino patients with T2DM, measuring the participant's knowledge by administering a questionnaire on three separate occasions during the project period, and acquiring the participants' HbA1C results at the beginning and end of the project. Due to a lack of participant involvement, the administration of the questionnaire on three separate occasions and the participants' self-reported HbA1C was unable to be statistically analyzed.

Overall, there was an inadequate amount of collected data to have a significant contribution to literature or to healthcare. Not a single participant completed the project in its entirety. As anticipated, attrition was the biggest barrier. An unanticipated outcome for the project included extending the recruitment period from four weeks to eight weeks. This occurred due to a lack of participant interest in initiating the questionnaire and reporting their HbA1C.

While the results were statistically insignificant, several recommendations for future improvement can be made. With attrition as the largest barrier, including more clinic sites, and a larger participant pool, has the potential to lead to an increase in statistically relevant data. Funds could be sought out to provide the participants with a device to complete the questionnaire while in the clinic prior to leaving their appointment. Monetary incentives may also increase attrition, this was a barrier as AHU does not incentivize participation in scholarly projects due to institutional policies and state lottery laws.

Stakeholders were also interviewed regarding their recommendations for future replication of this project. Mr. Khan recommended that while he did not see any barriers firsthand, that asking participants to complete the education as well as the pre-questionnaire in the clinic during their visit may improve adherence. The end-user recommended including more clinics to improve the attrition size.

While the previously identified problem of poorly managed T2DM in the Latino population in Central Florida continues to be an issue, a lack of initiative for self-education was identified as another barrier. Unfortunately, due to a lack of applicable data, no findings can be applied to clinical practice. While potential participants have shown a lack of eagerness to make changes to avoid the long-term effects of T2DM, the anesthesia provider still plays an essential role in providing appropriate education to this population and applying applicable interventions in the perioperative period. While this project could not have a profound impact on the knowledge base of our target population, it has outlined areas for improvement in future attempts at implementation.

Conclusion

Limitations

The primary limitation of this scholarly project was the small sample size. As a result, the collected data was not statistically analyzable. Due to this, the found data could not be generalized within other sample groups, and the focus was shifted to create recommendations to limit perceived barriers and facilitate replicable data collection.

Conclusion

A lack of attrition greatly disrupted the applicable results of this scholarly project. While education has been shown to impact health outcomes in previously instituted projects, the investigators were unable to replicate these results for this specific project. The created educational content and questionnaire can be applied in future attempts with the outlined recommendations. The investigators stand by the outlined PICOT and believe meaningful changes can occur in a participants lifestyle and HbA1C if appropriately applied to their daily habits.

Dissemination Plan

An AHU dissemination PowerPoint and poster will be presented in spring of 2023 at AHU in Orlando, Florida. Due to poor attrition, the scholarly project will be redesigned with limitations and barriers taken into consideration. Another DNAP group of investigators will continue this project in the hopes of attaining meaningful data.

Budget

This scholarly project's total budget was $416.19. Printing of the flyers was $32.19, and the Survey Monkey subscription was $384.

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Appendix A

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Fortmann, A. L., Gallo, L. C., Garcia, M. I., Taleb, M., Euyoque, J. A., Clark, T., Skidmore, J., Ruiz, M., Dharkar-Surber, S., Schultz, J., & Philis-Tsimikas, A. (2017). Dulce Digital: An mHealth SMS-Based Intervention Improves Glycemic Control in Hispanics With Type 2 Diabetes. *Diabetes Care*, *40*(10), 1349–1355. https://doi.org/10.2337/dc17-0230

Purpose	Variables	Setting/Subjects	Measurement and Instruments	Results	Evidence Quality
Study 1: Explore the feasibility of adding a nurse case manager to Diabetes Self-Management Education (DSME). Study 2: Investigating the glycemic benefit and acceptability of a culturally tailored, SMS-based DSME and support intervention (Dulce Digital) among underserved Hispanics with poor control. **Design** Study 1: Two group pre-test, post-test control group. Study 2: Randomized, nonblinded, parallel-groups clinical trial.	Study 1: Primary Outcome: HbA1C Secondary Outcome: Fasting blood glucose, lipids, blood pressure, diabetes-related knowledge, health behaviors, and body mass index Study 2: Primary outcomes: HbA1c Secondary outcomes: Lipids, blood pressure, and BMI	Study 1: Setting: Starr country on the Texas-Mexico border Subjects:165, 35-70 y/o, diagnosed type 2 diabetic with verification by 2 FBG > 140 mg/dL, or taking insulin or hypoglycemic medications for more than one year. Study 2: Setting: San Diego and Riverside county Subjects: 126, Hispanic men and women, 18–75 years of age, who were uninsured or underinsured type 2 diabetes and poor glycemic control (as indicated by an HbA1c level of $\geq$7.5%).	Study 1: Weights and blood pressure were taken by office field staff. Study 2: A physical assessment with fasting venous blood draw and study questionnaires were completed at baseline, month 3, and month 6.	Study 1: The control group had a greater clinical improvement in HbA1C. Study 2: A statistically significant time-by-group interaction effect indicated that the Dulce Digital group achieved a significantly greater reduction in HbA1c over time compared with usual care. **Implications** Study 1: The DSME is an effective strategy for improving glycemic control, but only partial support for NCM. Study 2: Text message-based mHealth approaches such as Dulce Digital have the potential to achieve a significant benefit.	Study 1: Methodological flaws: No description of how FBG or HbA1c was attained. Participants were pulled from rosters of ongoing studies from one of the authors. Inconsistency: none Indirectness: none Imprecision: There were multiple issues with severe weather that impacted participation. Publication bias: none Study 2: Methodological flaws: Unknown how many texts were received and reviewed. Inconsistency: none Indirectness: none Imprecision: Large confidence interval of 95%. 10.3% of participants were lost Publication bias: none

Garcia, A. A., Brown, S. A., Horner, S. D., Zuniga, J., & Arheart, K. L. (2015). Home-based diabetes symptom self-management education for Mexican Americans with type 2 diabetes. *Health Education Research*, *30*(3), 484–496. https://doi.org/10.1093/her/cyv018

Hu, J., Amirehsani, K. A., Wallace, D. C., McCoy, T. P., & Silva, Z. (2016). A Family-Based, Culturally Tailored Diabetes Intervention for Hispanics and Their Family Members. *The Diabetes Educator*, *42*(3), 299–314. https://doi.org/10.1177/0145721716636961

Purpose	Variables	Setting/Subjects	Measurement and Instruments	Results	Evidence Quality
Study 1: Evaluate an innovative diabetes symptom awareness and self-management educational program for Mexican Americans. Study 2: To test efficacy of a family-based, culturally tailored intervention for Hispanics with type 2 diabetes and their family members. **Design** Study 1: Randomized controlled trial Study 2: Quasi-experimental design	Study 1: Primary outcomes: HbA1c Secondary outcomes: Blood pressure, symptoms and their severity, lipid levels, & BMI. Study 2: Primary outcomes: HbA1C Secondary outcomes: Diabetes knowledge, family support, self-efficacy, self-management, physical activity, health-related quality of life.	Study 1: Setting: Urban and rural communities in Central Texas. six Subjects: 72, Mexican American adults aged 25-75 years with type 2 diabetes Study 2: Setting: Six clinical sites including clinics, physician offices, and churches in rural counties in central North Carolina. Subjects: 186 participants that were community dwelling, Hispanic, $\geq$ 18 y/o, type 2 diabetic, and had an adult family member.	Study 1: HbA1c, triglycerides, total cholesterol, HDL and LDL blood samples were analyzed by a licensed laboratory. Blood pressure was taken with AHA guidelines and an average of three readings was used. Study 2: HbA1C by finger stick with a A1CNow+ test. Spoken Knowledge of Diabetes in Low Literacy Patients with Diabetes (SKILLD) Chronic Illness Resources Survey (CIRS) Stanford Diabetes self-efficacy (DSE) Revised Summary of Diabetes Self-Care Activities (SDSCA).	Study 1: Significant decrease in HbA1c from baseline, improvements in symptoms, symptom severity, diabetes knowledge, self-efficacy, empowerment, total and LDL cholesterol levels. Study 2: There were significant changes over time in A1C. **Implications** Study 1: Diabetes symptom self-management education is a new way to motivate patients to take steps necessary to achieve and maintain glucose levels within a normal range. Study 2: Including families may improve glycemic control, diabetes knowledge, self-efficacy and physical health-related quality of life.	Study 1: Methodological flaws: Questionnaires were translated and back-translated, creating room for error. Inconsistency: 37% of pilot participants completed all eight sessions, 62.5% completed seven visits and 9% completed fewer than half Indirectness: none Imprecision: none Publication bias: none Study 2: Methodological flaws: Only 35 patients were utilized in the final data due to attrition rates and missing data. Inconsistency: none Indirectness: none Imprecision: Large confidence interval of 95%. Publication bias: none

Palmas, W., Findley, S. E., Mejia, M., Batista, M., Teresi, J., Kong, J., Silver, S., Fleck, E. M., Luchsinger, J. A., & Carrasquillo, O. (2014). Results of the Northern Manhattan Diabetes Community Outreach Project: A Randomized Trial Studying a Community Health Worker Intervention to Improve Diabetes Care in Hispanic Adults. *Diabetes Care*, *37*(4), 963–969. https://doi.org/10.2337/dc13-2142

Pérez-Escamilla, R., Damio, G., Chhabra, J., Fernandez, M. L., Segura-Pérez, S., Vega-López, S., Kollannor-Samuel, G., Calle, M., Shebl, F. M., & D'Agostino, D. (2014). Impact of a Community Health Workers–Led Structured Program on Blood Glucose Control Among Latinos With Type 2 Diabetes: The DIALBEST Trial. *Diabetes Care*, *38*(2), 197–205. https://doi.org/10.2337/dc14-0327

Purpose	Variables	Setting/Subjects	Measurement and Instruments	Results	Evidence Quality
Study 1: Whether a community health worker (CHW) intervention improved clinically relevant markers of diabetes care in adult Hispanics. Study 2: Examine impact of the Diabetes Among Latinos Best Practices Trial (DIALBEST), a CHW led intervention for improving glycemic control among Latinos with type 2 diabetes. **Design** Study 1: Randomized controlled trial. Study 2: Parallel, community based RCT.	Study 1: Primary outcomes: HbA1c Secondary outcomes: Systolic and diastolic blood pressure, & LDL cholesterol levels. Study 2: Primary outcomes: HbA1C Secondary outcomes: Fasting blood glucose, lipid panel, blood pressure, & weight.	Study 1: Setting: North Manhattan, NY Subjects: 360, Hispanics aged 35–70 years, receiving care at primary care practice sites affiliated with CUMC. Last HbA1c measurement (performed in the preceding 12 months) was > 8.0% Study 2: Setting: Hartford County, CT. Patients attended community based ambulatory primary care clinics. Subjects: 211, Latino adults with type 2 diabetes that were aged > 21 years old, had a documented diagnosis of type 2 diabetes > 12 months, had HbA1C levels > 7%, and self-identified as Hispanic/Latino.	Study 1: HbA1c was measured using a latex agglutination assay. Cholesterol levels were measured using enzymatic colorimetric methods. LDL cholesterol was calculated using the Friedewald Equation. Study 2: Blood collection home visits were conducted using the A1cNow POC. Venous blood was collected for Lipid panel. Body weight, height, waist circumference, and blood pressure were all measured by trained interviewers that were blinded to the study.	Study 1: Nonsignificant trend toward improvement in HbA1c levels in the intervention group. Study 2: DIALBEST intervention led to a net reduction HbA1c difference from baseline of 20.42% at 3 months, a net reduction difference of 20.47% at 6 months, 20.57% at 12 months, and 20.55% at 18 months in favor of the CHW group. **Implications** Study 1: Greater intervention may achieve better glycemic control. Study 2: DIALBEST is an effective intervention for improving blood glucose control, CHWs proved to be essential for patient management.	Study 1: Methodological flaws: Adherence to intervention protocol varied greatly. Inconsistency: none Indirectness: none Imprecision: 13 participants lost. Publication bias: none Study 2: Methodological flaws: Not possible to gauge the impact that the patient's providers had on their results. Inconsistency: none Indirectness: none Imprecision: Overall dropout rate was 29.9%. Their data was not excluded in the baseline data. Large CI of 95%. Publication bias: none

Rosal, M. C., Ockene, I. S., Restrepo, A., White, M. J., Borg, A., Olendzki, B., Scavron, J., Candib, L., Welch, G., & Reed, G. (2011). Randomized Trial of a Literacy-Sensitive, Culturally Tailored Diabetes Self-Management Intervention for Low-Income Latinos: Latinos en Control. *Diabetes Care*, *34*(4), 838–844. https://doi.org/10.2337/dc10-1981

Rotberg, B., Greene, R., Ferez-Pinzon, A. M., Mejia, R., & Umpierrez, G. (2016). Improving Diabetes Care in the Latino Population: The Emory Latino Diabetes Education Program. *American Journal of Health Education*, *47*(1), 1–7. https://doi.org/10.1080/19325037.2015.1111177

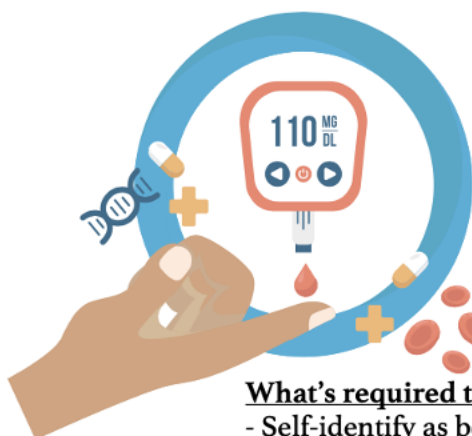| Purpose	Variables	Setting/Subjects	Measurement and Instruments	Results	Evidence Quality
Study 1: Test if a theory-based, literacy, and culturally tailored self-management intervention (Latinos en Control) improves glycemic control among low-income Latinos with type 2 dm. Study 2: Test the impact of a culturally tailored, literacy-sensitive DSME intervention on improving clinical indicators of care. **Design** Study 1: Randomized Control Trial. Study 2: Pre-post quasi-experimental design	Study 1: Primary outcome: HbA1C Secondary outcomes: Diet, physical activity, blood glucose self-monitoring, diabetes knowledge and self-efficacy, lipids, blood pressure, and weight Study 2: Primary outcomes: HbA1C Secondary outcomes: Blood pressure, BMI, increasing risk reduction examinations, improving diabetes related behaviors.	Study 1: Setting: 5 community health centers in Massachusetts. Subjects: 252 patients with Latino ethnicity, $\geq$ 18 y/o, type 2 diabetes, HbA1c within 7 months $\geq$ 7.5 Study 2: Setting: 7 primary care clinics in Georgia, home base of Grady Memorial Hospital in Atlanta. Subjects: 142 Spanish speakers that identified as Latino or Hispanic, age 18 or over, with type 2 diabetes.	Study 1: Fasting blood samples for HbA1C and lipid panel. Glucose data was downloaded at each intervention station. Blood pressure was taken by using the mean of two measurements. Height, weight, and waist circumference were determined by using the mean of two measurements. Study 2: Questionnaires that were specifically developed for the Emory Latino Diabetes Education Program (ELDEP). HbA1C, blood pressure, waist circumference, height, weight and BMI were measured at baseline and at the 3 months follow up.	Study 1: A difference in HbA1c was seen at 4 months, this difference decreased and lost statistical significance at 12 months. Study 2: Decrease in A1C from 9.1% to 7.0%. Both systolic and diastolic blood pressure decreased, and participants lost on average 2 pounds and 1 inch from their waist circumference. **Implications** Study 1: Culturally tailored interventions can improve diabetes control among Latinos. Study 2: Exploring culturally appropriate, community-based interventions to foster engagement in follow-up care may be useful in improving diabetes self-management in Latinos.	Study 1: Methodological flaws: Only 68% of the intervention group attended > 6 of 12 weekly sessions. Only 18% attended > 4 of 8 monthly sessions. Results were not separated. Inconsistency: none Indirectness: none Imprecision: Large CI of 95%. Publication bias: none Study 2: Methodological flaws: No control group was used. Only tested over 3 months. Inconsistency: none Indirectness: none Imprecision: Started with 810 participants, only 142 came to the follow-up. Only their data was included. Large CI of 95%. Publication bias: none

Spencer, M. S., Kieffer, E. C., Sinco, B., Piatt, G., Palmisano, G., Hawkins, J., Lebron, A., Espitia, N., Tang, T., Funnell, M., & Heisler, M. (2018). Outcomes at 18 Months From a Community Health Worker and Peer Leader Diabetes Self-Management Program for Latino Adults. *Diabetes Care*, *41*(7), 1414–1422. https://doi.org/10.2337/dc17-0978

Weinstock, R. S., Teresi, J. A., Goland, R., Izquierdo, R., Palmas, W., Eimicke, J. P., Ebner, S., & Shea, S. (2011). Glycemic Control and Health Disparities in Older Ethnically Diverse Underserved Adults With Diabetes: Five-year results from the Informatics for Diabetes Education and Telemedicine (IDEATel) study. *Diabetes Care*, *34*(2), 274–279. https://doi.org/10.2337/dc10-1346

Purpose	Variables	Setting/Subjects	Measurement and Instruments	Results	Evidence Quality
Study 1: Effectiveness of a community health worker diabetes self-management education program, followed by two different approaches to maintain improvements in HbA1c. Study 2: Examine the effectiveness of telemedicine in diabetes management, for 5 years in ethnically diverse older adults. **Design** Study 1: Randomized control trial. Study 2: Large, randomized trial.	Study 1: Primary outcomes: HbA1c Secondary outcomes: Blood pressure, lipid levels, diabetes distress, depressive symptoms, understanding of diabetes self-management, and diabetes social support. Study 2: Primary outcomes: HbA1c Secondary outcomes: BMI, urine microalbumin-to-creatinine ratio, and questionnaires.	Study 1: Setting: Community Health and Social Services Center (CHASS) in southwest Detroit, Michigan. Subjects: 222, ≥ 21 years old and self-identified as Latino with type 2 diabetes. Study 2: Setting: Federally designated Medically Underserved or Health Professional Shortage Areas. Subjects: 1,665 ethnically diverse underserved older adults on Medicare.	Study 1: Baseline questionnaires and assessments were conducted at baseline and at a 6, 12, and 18 months. HbA1c was measured with a Bayer DCA 2000+ analyzer. Total cholesterol, LDL, and HDL were tested using the Cholestech LDX POC machine. Study 2: HbA1c performed by Medstar laboratory. Completion of the SHORT-Comprehensive Assessment, Referral Evaluation depression scale, and general health short Form, Charlson Comorbidity Index, Lubben Social Network scale, and general health short form.	Study 1: Participants in the CHW intervention at 6-months had greater decreases in HbA1c. CHW-only maintained improvements in diabetes distress at 12 and 18 months. Study 2: The Hispanic telemedicine group compared with the usual care group had significantly lower HbA1c levels at the end of 5 years. The difference was statistically significant. **Implications** Study 1: There is effectiveness of a 6 month CHW intervention on key diabetes outcomes. Study 2: Telemedicine has the potential to help reduce disparities in diabetes management.	Study 1: Methodological flaws: Results limited to Detroit population. Psychological data was self-reported. Inconsistency: none Indirectness: none Imprecision: Large CI of 95%. Out of 222 initial participants 108 finished. Publication bias: none Study 2: Methodological flaws: Unable to state if females or males faired better from the intervention. Unable to assess intensification of medications. Inconsistency: none Indirectness: none Imprecision: : Large CI of 95%. Publication bias: none

Chrvala, C. A., Sherr, D., & Lipman, R. D. (2016). Diabetes self-management education for adults with type 2 diabetes mellitus: A systematic review of the effect on glycemic control. *Patient Education and Counseling*, *99*(6), 926–943. https://doi.org/10.1016/j.pec.2015.11.003

Hildebrand, J. A., Billimek, J., Lee, J., Sorkin, D. H., Olshansky, E. F., Clancy, S. L., & Evangelista, L. S. (2020). Effect of diabetes self-management education on glycemic control in latino adults with type 2 diabetes: A systematic review and meta-analysis. *Patient Education and Counseling, 103*(2), 266-275. https://doi.org/10.1016/j.pec.2019.09.009

Purpose/Objectives	Search Strategy	Number and Type of Studies in the Review Including Sample Sizes	Results	Conclusions/ Implications	Evidence Quality
Study 1: Evaluate the impact of DSME compared with usual care or a minimal educational intervention on A1C levels in adults diagnosed with T2DM. Study 2: Evaluate the effectiveness of DSME in reducing A1C levels in adult Latinos with type 2 diabetes.	Study 1: Search strategy used the National Library of Medicine Medical subject headings including "type 2 diabetes," "self-care education," "self-management," and "behavior change." All relevant articles were reviewed. Time selected was 1/1/97-12/21/13. Study 2: MeSH terms: diabetes, type 2 diabetes mellitus, self-management education, selfcare, A1C, Latino, Latina, Hispanic, Spanish-speaking, or Mexican American. Search was limited to journals between 1/1997- 3/2019.	Study 1: Randomized Control Trials involving participants 18 years or older. Required report of A1C outcomes, and to meet the definition of DSME. 120 studies were included in the systematic review, with 11,854 and 11,093 participants. Study 2: Adult Latinos with T2DM; usual care included standard primary care or minimal educational intervention. The inclusion of quasi-experimental studies. Each study that was included in the review had to report baseline and endpoint A1C values. Total of 23 studies were reviewed with a total of 3,969 participants.	Study 1: The overall mean reduction in A1C for all participants randomized to DSME was 0.74 (SD, 0.63) with a range of 0.6 to 2.50 and a median of 0.60 versus a mean decrease of 0.17 (SD, 0.50), range 1.5 to 1.7, and median of 0.12 for all CG participants. Combination DSME was associated with the greatest change in A1C. Study 2: The greatest reduction in A1C was in studies that were ≤ 6 months. Studies with initial A1C values higher than 8.5% reported greater A1C reductions. Participants assigned to a team approach experienced greater A1C reductions.	Study 1: Conclusion: All methods of DSME, delivered by either by a solo or team provider achieved greater reductions in A1C compared with CG participants. Implications: Quality diabetes care should include engagement in DSME because it enhances the glycemic control seen with usual care. Study 2: Culturally tailored DSME interventions significantly reduce A1C in Latinos with type 2 diabetes despite heterogeneity in the studies.	**Methodological flaws:** Study 1:Lack of binding assessor, healthcare providers, and participants; potentional for contamination between IG and CG. Study 2: Inconsistency with the educational material provided to participants could sway the results of A1C reduction in either direction. **Inconsistency:** Study 1: None Study 2: None **Indirectness:** Study 1: None Study 2: None **Imprecision:** Study 1: Confidence Intervals of reviewed studies not outlined. Study 2: 95% confidence interval = -0.345, **Publication bias:** Study 1: None Study 2: None

Appendix B

Budget heading	Total budget allocated	Expenditure this reporting period	Total expenditure to date
	USD	*USD*	*USD*
Printing of Flyers	$0	$32.19	$32.19
Survey Monkey	$0	$384	$416.19
TOTAL			$416.19

Appendix C

Are you a Latino living with type 2 diabetes?

# Are you interested in learning how to control your diabetes?

What's required to be in the study?
- Self-identify as being Latino
- Must have type 2 diabetes
- Must have access to the internet either through your phone or home
- Speak/read English or Spanish
- Have your doctor clear you to participate in this study

How does the study work?
- This study involves diabetes education and a HbA1C assessment
- If you have not had a HbA1C drawn within three months, you will have one drawn at your appointment
- After following the QR code on this brochure you will:
- Take a diabetic knowledge test
- Watch a short educational video
- Take the same diabetic knowledge test
- In three months, you will have a HbA1C taken and take the same diabetic knowledge test
- If a HbA1C test is not covered by your insurance, funds will be provided so you can take this test free of charge
- If you are unable to complete the bloodwork, you can still participate in the diabetic education
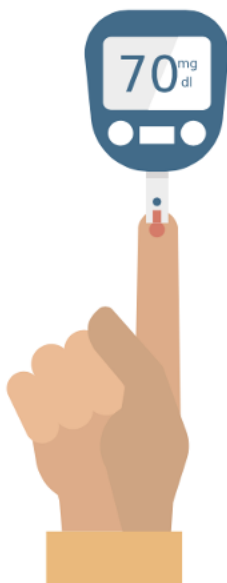
To be a part of this study:
1. Open the camera on your phone
2. Hover over the QR code shown below
3. Follow the prompts to complete the diabetic knowledge test and watch a 15-minute educational video
- If you are unable to use the QR code please access the content through this web address:
_____
- Keep this flyer with you so you can access this content whenever you like

Appendix D

Diabetes & You Questions:

1) What test will your doctor order to track how well your blood sugar has been controlled over the last two to three months?
   a. Fasting blood sugar
   b. Glucose tolerance test
   c. <mark>Hemoglobin A1C</mark>
   d. Random glucose

Content in PowerPoint: Slide #3
Corresponding objective: How to manage their blood sugar.
Source: American Diabetes Association. (2021d). *Diagnosis | ADA*. Diabetes.
    https://www.diabetes.org/a1c/diagnosis

2) Maria ate dinner based on the plating tip from the American Diabetes Association. Her dinner included carrots, green beans, brown rice, and chicken. Which item from Maria's dinner is a starchy vegetable?
   a. <mark>Brown Rice</mark>
   b. Carrots
   c. Chicken
   d. Green beans

Content in PowerPoint: Slide #5
Corresponding objective: How to eat better for diabetic management.
Source: American Diabetes Association. (2021f). *Where Do I Begin?* Diabetes.
    https://indd.adobe.com/view/865c24ce-4a14-4b91-9ea7-
    da718b987f10?loc=LWT2D_signupform_thankyou_bk&mkt_tok=MTAzLVFDRi0zMT
    EAAAF_l7_T8-8fY1NWxeSu8QhrXdwZxcb80--MS8pRW4pzLv5vHoxMlu8U-
    C8D1p1f8XLxrD2AiwAfiMseyWtxuAJFAqSRTQ4-cExteB742UF1kAM

3) Which food item is a non-starchy vegetable?
   a. <mark>Green beans</mark>
   b. Pinto Beans
   c. Potatoes
   d. Tortillas

Content in PowerPoint: Slide #5
Corresponding objective: How to eat better for diabetic management.
Source: American Diabetes Association. (2021f). *Where Do I Begin?* Diabetes.
    https://indd.adobe.com/view/865c24ce-4a14-4b91-9ea7-
    da718b987f10?loc=LWT2D_signupform_thankyou_bk&mkt_tok=MTAzLVFDRi0zMT
    EAAAF_l7_T8-8fY1NWxeSu8QhrXdwZxcb80--MS8pRW4pzLv5vHoxMlu8U-
    C8D1p1f8XLxrD2AiwAfiMseyWtxuAJFAqSRTQ4-cExteB742UF1kAM

4) What hormone is your body lacking when you have type 2 diabetes?
   a. Estrogen
   b. <mark>Insulin</mark>
   c. Glucagon
   d. Testosterone

Content in PowerPoint: Slide #3
Corresponding objective: What the diagnosis of type two diabetes means.
Source: American Diabetes Association. (2021f). *Where Do I Begin?* Diabetes.
   https://indd.adobe.com/view/865c24ce-4a14-4b91-9ea7-
   da718b987f10?loc=LWT2D_signupform_thankyou_bk&mkt_tok=MTAzLVFDRi0zMT
   EAAAF_l7_T8-8fY1NWxeSu8QhrXdwZxcb80--MS8pRW4pzLv5vHoxMlu8U-
   C8D1p1f8XLxrD2AiwAfiMseyWtxuAJFAqSRTQ4-cExteB742UF1kAM

5) Which is a symptom of type 2 diabetes?
   a. Anemia
   b. <mark>Blurry vision</mark>
   c. Diarrhea
   d. Hearing loss

Content in PowerPoint: Slide #3
Corresponding objective: What the diagnosis of type two diabetes means.
Source: American Diabetes Association. (2021e). *Type 2 Diabetes - Symptoms, Causes,*
   Treatment | ADA. https://www.diabetes.org/diabetes/type-2

6) What is the maximum number of alcoholic beverages that you can drink without having
   an increase in blood sugar?
   a. None
   b. One
   c. <mark>Three</mark>
   d. Five

Content in PowerPoint: Slide #4
Corresponding objective: How to improve exercise and live a healthier lifestyle.
Source: American Diabetes Association. (2021b). *Alcohol and Diabetes | ADA*. Diabetes.
   https://www.diabetes.org/healthy-living/medication-treatments/alcohol-diabetes

7) According to the American Diabetes Association, how much exercise is suggested?
   a. <mark>30 minutes a day, 5 times a week</mark>
   b. 45 minutes a day, 5 times a week
   c. 60 minutes a day, 3 times a week
   d. 90 minutes a day, 3 times a week

Content in PowerPoint: Slide #4
Corresponding objective: How to improve exercise and live a healthier lifestyle.

Source: American Diabetes Association. (2021f). *Where Do I Begin?* Diabetes.
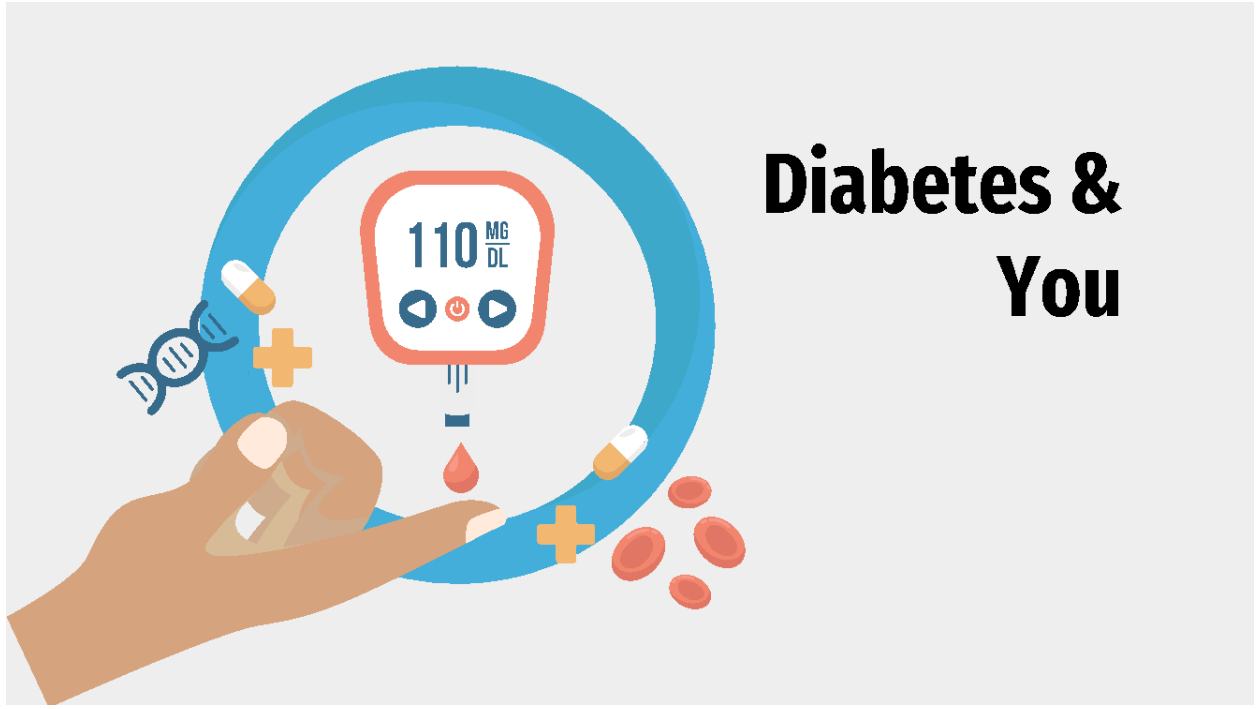   https://indd.adobe.com/view/865c24ce-4a14-4b91-9ea7-
    da718b987f10?loc=LWT2D_signupform_thankyou_bk&mkt_tok=MTAzLVFDRi0zMT
    EAAAF_l7_T8-8fY1NWxeSu8QhrXdwZxcb80--MS8pRW4pzLv5vHoxMlu8U-
    C8D1p1f8XLxrD2AiwAfiMseyWtxuAJFAqSRTQ4-cExteB742UF1kAM

8) Which is a long-term effect of type 2 diabetes?
    a. Abdominal pain
    b. Asthma
    c. Nerve damage
    d. Tooth loss

Content in PowerPoint: Slide #7
Corresponding objective: Long-term effects of type 2 diabetes.
Source: American Diabetes Association. (2021c). *Diabetes Complications | ADA*. Diabetes.
    https://www.diabetes.org/diabetes/complications

9) What is the minimum weight loss suggested by the American Diabetes Association to positively impact your diabetes?
    a. lose 5 pounds
    b. lose 10-15 pounds
    c. lose 25-30 pounds
    d. lose 50 pounds

Content in PowerPoint: Slide #8
Corresponding objective: How to improve exercise and live a healthier lifestyle.
Source: American Diabetes Association. (2021d). *Diagnosis | ADA*. Diabetes.
    https://www.diabetes.org/a1c/diagnosis

10) Complications of diabetes can be improved by eating healthy, exercising, and managing blood sugar.
    a. True
    b. False

Content in PowerPoint: Slide #7
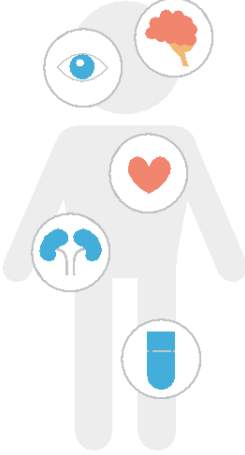Corresponding objective: Long-term effects of type 2 diabetes.
Source: American Diabetes Association. (2021c). *Diabetes Complications | ADA*. Diabetes.
    https://www.diabetes.org/diabetes/complications

Appendix E

Diabetes & You

Expected Outcomes

What is Type 2 Diabetes?

Let's talk about what this means and the signs & symptoms.

Exercise & Healthy Living

We'll review simple ways to add activity and healthy habits into your life.

Long-term effects

Diet

We'll talk about a proper diet in a way that's easy to apply to your daily life.

Blood Glucose Management

We'll simplify how to manage your blood glucose, also known as blood sugar so it isn't so daunting.
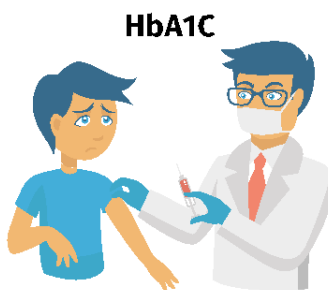
What is Type 2 Diabetes?

What is type 2 diabetes?

If you have type 2 diabetes, your body isn't producing enough insulin to manage your blood sugar.
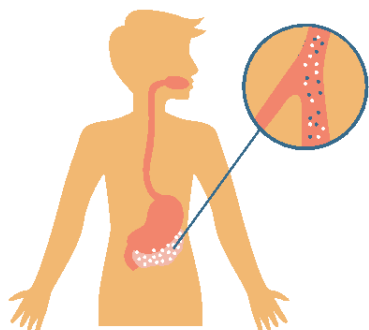
How is it diagnosed?

Your doctor probably ordered blood work because you had symptoms.

HbA1C

What are the symptoms?

Fatigue

Tingling

Slow healing

Feeling hungry

Exercise & Healthy Living

Weight Loss
Losing a little can help a lot
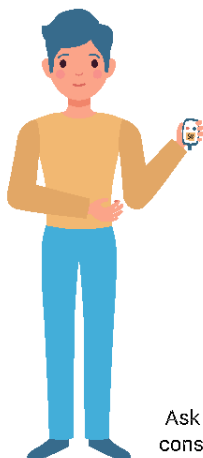
Adequate Sleep
Getting enough sleep will help you perform

Keep Active
Get moving any way you can!

Keep up with your visits
Many healthcare professionals may be involved in your care.

Advocate
If you feel something, tell someone!

Don't Smoke & limit alcohol
Ask your doctor if alcohol is safe to consume while on your medications and tips on how to quit smoking.

So, what should your diet look like?

Limit

Sugar

Baked goods, sweet tea, sodas

Starchy Vegetables

Brown rice, tortillas, pinto beans, potatoes

Fruit & Dairy

Mango, papaya, melon, banana
Fat-free, skim or 1% milk,
& low-fat yogurt

Enjoy

Nonstarchy Vegetables

Canned vegetables, carrots, green beans, onions & tomatoes

Proteins

Chicken, turkey, fish, other seafoods, lean beef & pork

Water

Replace high sugar beverages with water

Blood Glucose Management

HbA1C
This will tell your doctor how well your current plan is working.

Oral Medications
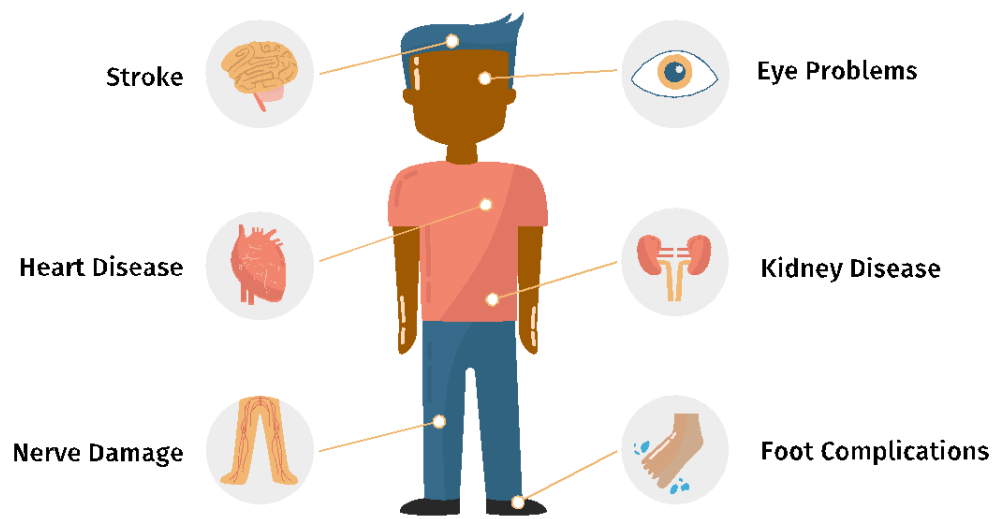Some diabetics can be controlled with oral medications.

Checking Blood Sugar
Knowing your blood sugar keeps you in control.

Treating your Blood Sugar
Some diabetics require insulin to stay on track.

Overall Health
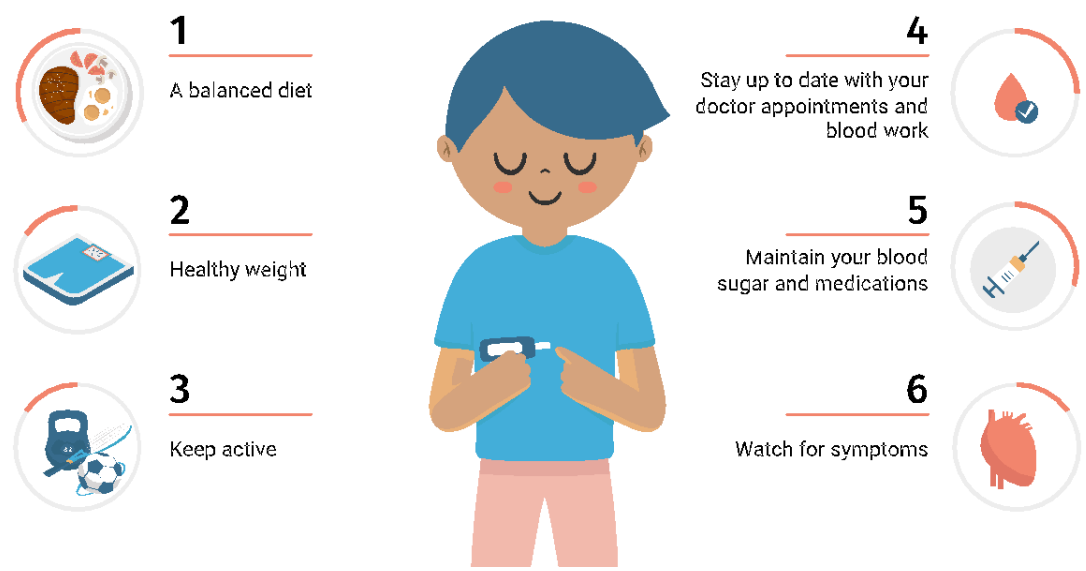Diabetes can affect more than just your blood sugar.

End Result
You have the power to control your blood sugar!

Long-term Effects

Stroke

Eye Problems

Heart Disease

Kidney Disease

Nerve Damage

Foot Complications

i

Bringing it all together

1

A balanced diet

2

Healthy weight

3

Keep active

4

Stay up to date with your doctor appointments and blood work

5

Maintain your blood sugar and medications

6

Watch for symptoms

What happens next?

Diabetic knowledge

Test now and in three months.

Apply this education

Take what you've learned and use it in your daily life.

HbA1C

Have your HbA1C tested in three months.

5.8

References

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Appendix F

SRC Approval: 11/2/21

- originally planned for 10/27/21

IRB Approval: 12/9/21

- originally planned for 12/10/21

Clinic Staff Education on Project: 1/5/ 2022

Recruitment Period: 1/10/22- 3/7/22

- originally planned for 1/10/22- 2/10/22

Implementation: 5/9/22-8/12/22

- Analyze data

- Compare initial survey analysis with follow-up survey analysis

- Update limitations to accurately depict difficulties with recruitment

- Using data, show if any correlation was found between project engagement and retention
  of knowledge or HbA1C

- Make recommendations for future use of education to increase recruitment

- Incorporate all data points, limitations, and recommendations into final manuscript

Dissemination: 9/6/22 – 04/07/23

- Finalized project presentation/manuscript

- Completion of Scholarly Project Final Manuscript Approval Form

- Submission Scholarly Project Final Manuscript Approval Form to DNAP faculty

- Completion of research report for full review by chair (Dr. Bracken)

- Creation PowerPoint presentation to represent scholarly project in full