

THE EVALUATION OF A DIABETES SELF-MANAGEMENT PROGRAM  
DELIVERED IN A COMMUNITY HEALTH CLINIC

by

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A DNP Project Submitted to the Faculty of the

COLLEGE OF NURSING

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF NURSING PRACTICE

In the Graduate College

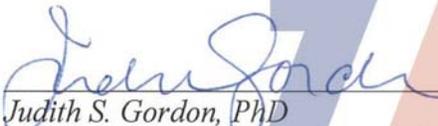
THE UNIVERSITY OF ARIZONA

2019

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As members of the DNP Project Committee, we certify that we have read the DNP project prepared by *Tamara N. Sumler*, titled *The Evaluation of a Diabetes Self-Management Program Delivered in A Community Health Clinic* and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

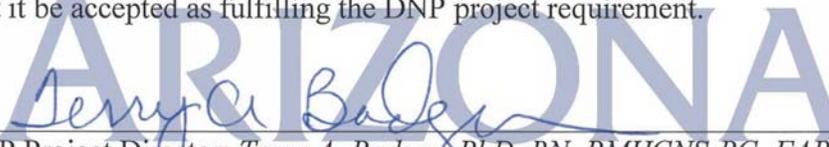
  
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Final approval and acceptance of this DNP project is contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College. 

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.

  
  
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## DEDICATION

This DNP Project Paper is dedicated to two family members who passed away over the course of my doctoral program, my Aunt Betty and Cousin Lorenzo. Despite their unexpected deaths in the last 1½ years of my program, it is their love and memory that propelled me to get through the remaining semesters, and they will forever be my guardian angels.

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## ABSTRACT

**Background:** The prevalence and incidence of type 2 diabetes are steadily increasing in the United States. Diabetes self-management education (DSME) programs seek to improve delivery of diabetes care and education. The end result of diabetes self-management education is behavior change towards successful self-management of diabetes and improved outcomes.

**Aims:** Aims of project are to assess whether project site's existing DSME program meets evidence based standards for diabetes self-management education, to explore potential variables that reflect existing diabetes self-management program, and to obtain perceptions about existing program, barriers and facilitators to class attendance, and ideas for program improvement from self-management class participants and class facilitators.

**Methods:** The project was implemented in a large Federally Qualified Health Care (FQHC) clinic using a descriptive study design. A sample of 20 adult diabetic patients who attended at least one diabetes self-management class between months of July, August, and September, 2018 was obtained. Additionally, I attended two diabetes self-management classes to distribute surveys to both self-management class participants and class facilitators.

**Results:** Among the sample of adult diabetic patients, 75% were women. Mean age was 60.7 years old. Mean number of classes attended among sample was 7.35, the mean A1C was 8.7%. The project site's diabetes self-management education program met six out of 10 of National Standards for Diabetes Self-Management Education and Services (evidenced-based tools for health care providers and health care organizations who provide diabetes education). Eleven class participant surveys were returned and demonstrated that the majority of class participants were satisfied with existing self-management program, including current method of education

(face-to-face group education). Barriers for self-management classes were transportation, distance between home and clinic where classes are held, time that classes are held, and conflicting appointments during time classes are held. Facilitators to attending class were vouchers for fresh fruits and vegetables given as incentive for attending classes, being provided with transportation to classes, and social interaction that occurs from attending classes. Class facilitators most enjoyed opportunities class participants had to ask more questions pertaining to diabetes self- management. Limited class offerings in English language and time restraints were identified among class participants as least enjoyed aspect of existing self-management program. Both class participants and facilitators suggested addition of an exercise segment and cooking demonstration to existing diabetes self-management program.

**Conclusion:** Project findings suggest while the sample utilized diabetes self-management education classes conducted at the clinic, they demonstrated poor glycemic control and thus poor self-management of diabetes. Continuous quality improvement measures should be initiated to ensure the existing program is meeting evidence-based standards, while delivering diabetes self-management education and services that are patient centered, effective in meeting and sustaining glycemic control, and improve outcomes subsequently. A significant project limitation was low class attendance among diabetes self-management class participants during time of data collection. Lack of medical provider stakeholder input regarding project site's existing diabetes self-management program was an additional limitation in this project. These conclusions must be reviewed cautiously in light of identified project limitations.

## INTRODUCTION

Over 9% of adult Americans have type 2 diabetes mellitus, making it one of the most common metabolic disorders in the United States(U.S.) (Centers for Disease Control and Prevention [CDC], 2017). It is estimated that one in three Americans will develop type 2 diabetes by the year 2050 (American Diabetes Association, 2015). Diabetes is defined as an ineffective use of insulin. Additionally, type 2 diabetes mellitus is the most prevalent form of the disease compared to type 1, with a rapidly growing incidence in both children and adults (World Health Organization [WHO], 2017). One non-modifiable risk factor for type 2 diabetes is a family history of the disease, while modifiable risk factors include excess weight and a sedentary lifestyle. In the United States, type 2 diabetes accounts for approximately 1.6 million deaths among adults and is projected to become one of the leading causes of death in the years to come. The CDC (2018), reports over \$300 billion dollars are spent on medical care and resources for diabetic patients in the U.S. each year, creating a significant financial burden to individuals and society.

Every year increasingly more Americans receive a diagnosis of diabetes, but a diabetes diagnosis is not the only problem. It is the lack of diabetes self-management education and support that is a contributing factor among those who exhibit poor glycemic control and are at greater risk for microvascular and macrovascular complications (Lau, Campbell, Tang, Thompson, & Elliott, 2014). Ongoing education that promotes self- management or self-care is an integral part of any chronic illness, and diabetes is no exception (Haas et al., 2012). Implementing a diabetes self-management education program can increase patients' knowledge on self-care behaviors that can significantly impact their glycemic control and contribute to the

global health initiatives of improving outcomes in diabetic patients (Chrvala, Sherr, & Lipman, 2016).

### **Background**

Although education is one of many approaches for managing chronic disease, the American Diabetes Association (ADA) deems diabetes self-management education (DSME) an essential component of diabetes care (Powers, 2016). Diabetes self-management education programs are regarded as tools that improve self-efficacy through disease knowledge and behavior modifications (Vanderbosh et al., 2018). Research shows that effective self-management not only improves clinical outcomes and quality of life, but also aids in decreasing the U.S. healthcare system's financial burden (Powers et al., 2015). Because diabetes is a chronic disease with preventable complications, education on self-management of the disease is necessary and should be offered to diabetic patients at the time of diagnosis and thereafter (Beck et al., 2017). The goal of the healthcare team in helping patients self-manage diabetes is to provide education and services that are continuous, timely, of high quality, and patient centered. Such care should be evidence-based and collaboration should occur using an integrated health team approach to reach long term goals of DSME. Such goals are to improve outcomes, improve quality of life and decrease costs associated with diabetes complications (Beck et al., 2017).

In 2017, the American Diabetes Association (ADA) and American Association of Diabetes Educators (AADE) formed a task force to revise the already existing standards of care for diabetes self-management education and support programs (DSMES). The 10 evidence-based National Standards (Standards) serve as a tool for program evaluation by assessing access to services, utilization rates, cost effectiveness, and clinical outcomes (Beck et al., 2017) (Table 1).

TABLE 1. *National standards for evaluation of diabetes self-management education programs.*

<b>Standard</b>		<b>Definition</b>
1	Internal Structure	The DSME service provider's identification and documentation of its mission, goals and structure.
2	Stakeholder Input	Identifying and obtaining ideas from internal and external stakeholders regarding program utilization, quality, outcome measures, and sustainability for planning and continuous quality improvement purposes.
3	Evaluation of Population Served	The surveying of the target population and community to determine the needs and ensure that DSME services align with those needs.
4	Quality Coordinator Overseeing DSMES	A designated individual who collects and analyzes data pertaining to the utilization, effectiveness, and quality of the services provided with the DSME team and stakeholders.
5	DSMES Team	Healthcare professionals that demonstrate competency in DSME services such as a registered nurse, registered dietitian, pharmacist or other health care professional with certification in diabetes education or diabetes management. Diabetes paraprofessionals (medical assistants, community health workers) who have undergone training in DSME services may serve as DSME team members as well.
6	Curriculum	DSME content that is current, evidenced-based, and individualized. Content must evolve with the needs of the population and be adaptable to various methods of education and settings. Content should include core content areas, education on the AADE's 7 self-care behaviors, include supplemental education resources and support, and include guidelines for measuring outcomes.
7	Individualization	Patient-centered DSME education and support that takes into consideration specific needs, age, cultural preferences, and participant priorities.
8	Ongoing Support	The provision of internal and external educational resources and support services to sustain the acquired self-management skills.
9	Participant Progress	Tracking participant progress towards meeting personal goals and clinical outcomes. Evaluation of participant progress should occur using validated measurement tools at specific measures. Results should be shared with the participant and stakeholder groups.
10	Quality Improvement	The continual development and employment of strategies to improve quality, sustainability, and participant outcomes.

The national standards for diabetes self-management education and support outline the key elements that should be implemented in a DSME program. These standards also aid diabetes

educators, clinicians, and healthcare institutions in providing quality, evidence-based self-management education and services to the diabetic population and those at risk for developing diabetes (Beck et al., 2017). Furthermore, the 10 Standards for diabetes self-management education serve as a tool for program evaluation in the areas of program access and utilization, cost effectiveness, and clinical outcomes, and are recognized and accredited by the American Diabetes Association and American Academy of Diabetic Educators (Powers et al., 2015). The standards recommend diabetes self-management curriculum that consists of standardized diabetes core content such as disease pathophysiology, diet, exercise and medical treatment, behavioral and psychosocial support such as decision making, problem solving, and coping skills, and prevention and recognition of disease related complications. The inclusion of content that is culturally relevant and individualized based on language and literacy level, age appropriateness, and the use of trained interpreters when deemed necessary and appropriate are additional factors to consider when evaluating diabetes self-management programs (Beck et al., 2017).

The Standards also favor evaluating a DSME program's outcomes and quality data. Such data helps to identify gaps in diabetes self-management program utilization, and to identify areas of improvement. Outcome measurement is recommended to evaluate the effectiveness of existing practices and yield important information for program improvement (Beck et al., 2017).

In addition, the Standards also call for diabetes self-management education programs to offer ongoing support to its participants. The Standards define ongoing support as a patient-centered approach to sustaining acquired self-management knowledge and skills beyond the initial improvements in outcomes that occurred immediately or shortly after participation in

diabetic self-management classes (Beck et al., 2017). It is recommended that diabetes self-management education programs offer self-management resources and services within and outside of the practice/organization to support behavior changes that occur as a result of successful self-management of diabetes. The Standards recommend offering ongoing support through the use of technology and urge self-management education programs to embrace technology as an innovative means for patient engagement (Beck et al., 2017). This method of ongoing support increases access to information and facilitates continued awareness and patient and provider engagement in diabetes care and management (Urowitz et al., 2012).

Lastly, the Standards support conducting a periodic assessment of patient needs as they change along with patient circumstances over time. It is recommended that an evaluation of the current diabetes self-management education program take place to track patient outcomes before and after undergoing self-management classes. The Standards recommend tracking outcomes in the areas of disease knowledge/awareness, behavior changes, and clinical outcomes such as the A1C, cost effectiveness, patient satisfaction, and quality of life using validated measurement tools (Beck et al., 2017). Based on the literature, tracking patient outcomes is not only a necessary component of continuous quality improvement, but it serves as documentation on benefits of diabetes self-management education. Tracking positive patient results or outcomes can then be used for marketing and funding purposes (Beck et al., 2017).

### **Barriers and Facilitators**

Diabetes self-management education has shown to be beneficial in the areas of cost effectiveness, decreased risk for complications, increased self-efficacy, decreased diabetes distress which influences decision making, improvement in coping skills, and improvement in

quality of life (Chrvala, Sherr, & Lipman, 2015). However, despite the benefits of diabetes self-management education, underutilization still exists. Lack of access to diabetes self-management programs and services in close proximity to the patient's home or community serves as one of many barriers that exist (Chomko, Odegard, & Evert, 2016). The absence of perceived benefit among diabetic patients is another identified barrier in the utilization of diabetes self-management education (Schwennesen, Henriksen, & Willaing, 2016). Patients or referring medical providers who disagree with the self-management education content or view such as unnecessary may influence patient participation. Additionally, confusion about when to refer to a diabetes self-management education program serves as a barrier to access and can result in underutilization of diabetes self-management education (Powers, 2016).

Insurance reimbursement can be an additional barrier in self-management utilization. Of newly diagnosed diabetic patients, only 6.8% of those with private insurance participated in self-management programs, while only 4% of those newly diagnosed patients with Medicare participated (Powers et al., 2015). This raises the question that if reimbursement rates are low, will health care providers be less inclined to refer patients to self-management programs? If so, the underutilization of self-management programs may persist.

On the contrary, a significant facilitator of diabetes self-management education programs is the positive impact it yields on clinical measures such as the hemoglobin A1C (Chrvala, Sherr, & Lipman, 2015). Additionally, diabetes self-management education is both cost effective and cost efficient and has shown to be beneficial in increasing self-empowerment. Thus, increased self-empowerment has a positive effect on quality of life and health outcomes among diabetics (Peros, James, Nolan, & Meyerhoff, 2016). In general, diabetes self-management classes are free

to attend. Voluntary class attendance and an extended invitation to the patient's family and/or support system to attend class can be influential factors in program utilization. Furthermore, self-management education and services offered in the patient's primary care medical home (PCMH) in which the patient is familiar with the health care team, facilitates enhanced communication and patient engagement in diabetes care (Chomko, Odegard, & Evert, 2016).

### **Purpose, Aims and Objectives**

The goals of this project were to: 1) assess whether the existing program meets evidence-based guidelines for diabetes self-management education programs; 2) assess the potential variables that reflect the current diabetes self-management program; and, 3) survey self-management class participants and class facilitators to obtain their perceptions about the existing program, barriers and facilitators to class attendance, and 4) ideas for program improvement.

The barriers to class attendance that will be discussed include: a) the day of the week that classes are held; b) the time that class is held; c) location of class (which is currently face-to-face at the clinic); d) duration of class (too long/too short); and, 3) transportation issues that limit or prohibit class participation. This type of quality improvement project in this setting has not been conducted previously. A large percentage of the patients who receive treatment in my department have type 2 diabetes, thus this project is necessary to inform future improvements in the diabetes self-management education program in this practice setting.

The identified stakeholders are the established clinic patients/family with type 2 diabetes, clinic health care providers who comprise the multidisciplinary care team (i.e., medical providers, dietician, behaviorist, & clinical pharmacist), clinic administrators, the quality assurance team, and the community partners. A primary task in this project will be to evaluate

the project site's existing diabetes self-management education format and structure, and the organization's need and readiness for change based on program evaluation and stakeholder input.

### **THEORETICAL FRAMEWORK**

One of frameworks that support the inquiry of the clinical problem is Dorothea Orem's self-care theory. The theory employs the idea that if individuals/families are equipped with the tools to effectively perform self-care behaviors to manage a chronic illness, they will then possess a sense of fulfillment and motivation to continue such behaviors, especially if the outcome or results are positive. Diabetes self-management education programs are one of many effective approaches that teach the patient/family how to manage their chronic condition through self-care behaviors of diet, physical activity, pharmacologic therapies, coping skills and prevention of disease related complications (CDC, 2017). The self-care theory suggests patients who are able to perform self-care behaviors and consequently exhibit positive outcomes such as improved glycemic control, will be more inclined to continue such behaviors in order to sustain the benefit it provides.

Moran and Conrad (2014) state theory can be used to inform practice, and it "can be used to help understand antecedents to health events that negatively impact a population" (Moran & Conrad, 2014, p. 99). Lack of self-management of disease negatively impacts the diabetic population by increasing the risks of acquiring diabetes-related complications and death (Lau, Campbell, Tang, Thompson, & Elliott, 2014). Dorothea Orem's self-care theory is illness oriented and incorporates concepts of health promotion and health maintenance through self-care. Orem's theory assumes patients should be responsible for their care and if one is unable to meet self-care needs, the healthcare provider and healthcare team can assist the patient in

carrying out self-care activities when needed. The healthcare team teaching diabetes self-management education and offering of self-management services is an example of assisting patients with identifying and performing self-care activities (Nursing Theory, 2016b)

Orem's concept of self-care is defined as self-initiated activities that promote health and well-being. The concept of self-care agency is one's ability to engage in self-care, while the self-care demand concept is defined as actions performed to meet self-care needs such as engaging in self-management classes. Self-care requisites or requirements are actions that are directed towards the provision of self-care and consist of three categories: universal requisites, developmental requisites, and the health deviation requisites (Nursing Theory, 2016b). Universal requisites are described as basic needs of food, water, rest and social interaction. Developmental requisites are those that are associated with a developmental process, illness, or event. Health deviation requisites are self-care activities that derive from a condition or illness such as seeking medical assistance, adherence to medical treatment for a condition, or seeking knowledge on the disease pathophysiology. These self-care requisites are those that should be incorporated in diabetes self-management classes. The activities of seeking medical assistance, seeking knowledge on disease process, treatment adherence, and learning how to adjust or live with a chronic condition such as diabetes are self-care activities that comprise self-management and can contribute to a state of optimal wellness and outcomes (Powers et al., 2015).

Literature supports diabetes self-management education as a health promoting activity that fosters patient engagement and empowerment to manage chronic disease and prevent complications associated with poor disease management (Chrvala, Sherr, & Lipman, 2015). Nola Pender's Health Promotion (Health Promotion) theory is yet another theoretical framework that

can be applied to diabetes self-management education. The theory views health as a dynamic state in which engagement in health promoting activities such as disease self-management is the desired outcome. The Health Promotion theory states behavior modification and health promotion is shaped by individual experiences, prior experiences, and behavioral cognitions, affect, and outcomes (Nursing Theory, 2016a). Personal characteristics and prior behaviors whether acquired or inherited influence the likelihood an individual will display health promoting behaviors. The theory also posits that one's engagement in health promoting behaviors or activities are driven by four factors: the perceived susceptibility to disease complications, perceived severity of disease, perceived benefits of self-promoting behavior, and perceived barriers of self-promoting behaviors (Nursing Theory, 2016a). One of the theory's assumptions is that individuals seek to control their behavior. Participation in a diabetes self-management education program affords the opportunity to learn what behavior changes are necessary to achieve higher levels of wellness and improved outcomes (Beck, 2017).

Another theoretical framework that is appropriate for the project topic is the Quality Improvement (QI) framework. The proposed practice change involves evaluating the existing face-to-face diabetes education format including assessing barriers and facilitators to class attendance, and then making recommendations for practice change. The QI framework is one of the most widely recognized frameworks used to improve health care delivery on an organization level (AHRQ, 2013). Developed by the International Health Institute (IHI), the framework utilizes the Plan-Do-Study-Act (PDSA) cycle. The cycle begins with developing a plan to test the proposed practice change. The next phase of the cycle involves testing the practice change on a smaller scale before disseminating the proposed practice change among the larger organization.

The study phase occurs next and involves analyzing the data from the small scale implementation through data analysis. The last phase of the cycle consists of making necessary revisions to the implementation plan based on what was learned from the small scale implementation. The PDSA cycle can be repeated as often as necessary, as it is a tool for continuous improvement (AHRQ, 2013). The QI framework aligns with the project goals of determining how well the existing self-management classes are received, how well they are utilized, and the impact on glycemic control by evaluating hemoglobin A1C values among class participants. The end goal is not only to improve quality of care but also improve outcomes among diabetics, which requires a continuous cycle of quality improvement efforts (Finkelman, 2018). These outcomes are hemoglobin A1C and program utilization.

### **Concepts**

A primary goal of type 2 diabetes disease management is glycemic control. Successful disease management not only requires an awareness and acceptance of the disease or condition, by an attainment of knowledge and skills necessary to self-manage and prevent complications. In this project diabetes self-management class utilization (attendance), hemoglobin A1C levels of class participants, and the class content/program curriculum was measured. These variables were measured to evaluate the project site's existing self-management education program and the patient outcomes of those who participate in such. Class participants were surveyed to determine the level of satisfaction with the current education program, barriers to participating, and their preferred method of delivery of self-management education. The clinic's registered dietitians, behavioral health consultants, and diabetic community health worker who are facilitators of the

diabetes self-management classes, were surveyed on their perception of the current program and suggestions for program improvement as well.

The CDC classifies diabetes self-management and support education as instrumental in improving health outcomes among type 2 diabetics (CDC, 2017). Diabetic education is an evidence based clinical intervention that provides knowledge on self-care through diet and lifestyle modifications, prevention, and support from the health care team (CDC, 2017). Additionally, both traditional modalities and innovative technologies have been successful in engaging diabetic patients in self-management of chronic disease (Pal et al., 2018).

Current research shows diabetes self-management classes in general are efficacious. Despite low utilization as a whole, diabetes self-management programs prove to be a cost effective approach to improve health outcomes among diabetic patients (Powers et al., 2017). Collectively, the American Diabetes Association, American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics have developed national Standards for diabetes self-management programs. Such programs should be continuous, collaborative, and aim to increase disease knowledge and self-care behaviors, thus improving the quality of life among the diabetic population (Powers et al., 2017). Notably, evidence demonstrates participation in self-management education classes can be just as effective as some medications and when used in conjunction with medication can result in improvements in hemoglobin A1C values by as much as one percent (Powers et al., 2017).

At the clinic where the DNP project was conducted, the existing face-to-face group-based classes were held once weekly for one hour in English language and one hour in Spanish language. The project site's current program consists of four classes each month with varying

topics pertaining to diabetes self-management such as nutrition, physical exercise, diabetic-related complications and how to prevent such, and emotional health. Each month, the standard four class topics are repeated, giving new participants opportunity to join and previous participants a review of diabetes education previously learned. The project site's diabetes self-management program offers the classes to established diabetic patients and their families free of charge. The class schedule is maintained throughout the year from January to November.

Glycemic control is defined as a hemoglobin A1C value of less than 7% by the American Diabetes Association (ADA, 2015). As stated previously, suboptimal glycemic control has been linked to microvascular and macrovascular complications that can be prevented. Suboptimal glycemic control not only creates a global economic burden, but has also been attributed to poor or lack thereof self-management education at time of diagnosis and during the disease course (Crowe et al., 2016). Barriers such as language, socioeconomic status, and low health literacy levels may have a negative impact on self-care behaviors and can be associated with poor glycemic control (Crowe et al., 2016). Such barriers were found to exist in the project site's existing diabetes self-management program. Therefore, this data will be included in the executive summary that will be presented to the provider stakeholders for program improvement purposes.

### **Synthesis of Evidence**

A literature search was conducted to find the association between diabetes self-management programs and glycemic control, demonstrated by the clinical measure of the glycated hemoglobin, also known as hemoglobin A1C test. The electronic databases that were searched were the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and

PubMed. The search was employed by first using general search terms of diabetes education program and self-management searched separately. Subsequent searches for literature using CINAHL contained the Boolean operators: self-management and type 2 diabetes, self-management education and type 2 diabetes and glycemic control, self-management, type 2 diabetes, and web-based, and finally self-management education, type 2 diabetes, and group-based. My inclusion criteria included full text studies, studies conducted in the last five years, English language, and adults. The published studies that were excluded were systematic reviews and studies that did not demonstrate relationship between diabetes education and glycemic control. The initial search revealed 349 results. After limiting the results based on the above mentioned criteria, 28 studies were relevant to the project.

Of the reviewed studies pertaining to the self-management of type 2 diabetes, most of the literature focused on the relationship between self-efficacy and improved glycemic control. Dizdar et al., (2016) found that hemoglobin A1C levels decreased by over 1% after three months of participating in a diabetes self-management education program. Similarly, Aponte, Jackson, Wyka, and Ikechi (2017) demonstrated a decrease in hemoglobin A1C levels in the intervention group after participating in a diabetes self-management education program conducted by community health workers compared to the control group. This is significant to my project because one of the objectives is to evaluate the impact of the existing program on hemoglobin A1C results among those that participate in the diabetes self-management program.

There have been many studies conducted on the impact of cultural awareness and sensitivity on disease management and outcomes (Choi & Rush, 2012). One study in particular assessed the effectiveness of a culturally-sensitive diabetes education program. The study

findings revealed that diabetic patients demonstrated improved self-care behaviors, including glycemic control when enrolled in culturally-competent community -based programs. Study participants were more engaged, satisfied or highly satisfied and likely to recommend such a program to others (Choi & Rush, 2012). This is significant to my project because there is a large minority population that obtains health care services at the clinic in which the project will be carried out. Consequently, it would be ideal to offer self-management education that is culturally oriented to elicit behavior change. Additionally, providing diabetes self-management education that is culturally tailored does meet the national Standards for diabetes self-management education and support (Beck et al., 2017).

Overall, the strengths of the literature reviewed support ongoing education as essential in the long-term management of chronic illnesses such as type 2 diabetes. The literature reveals that patient participation in a diabetes education program is beneficial in that it allows for identification of knowledge deficits and the identification of barriers such as cultural differences, language, and socioeconomic factors that may impact diabetes management (Choi & Rush, 2012). While such educational programs vary in setting, duration, and facilitators, it is evident that general diabetes knowledge improves self-efficacy and improves patient confidence in disease management, thus optimizing glycemic control, quality of life, and health outcomes (Haesun, Thompson, Kreider, & Vorderstrasse, 2017). This is particularly important in medically underserved populations such as the site where this project was conducted. It is imperative to gain insight into the participant's perception of the diabetes self-management education program that they engage in. The information garnered from the participants during this project helped to determine if improvement was necessary, and will guide future program improvement efforts.

In conducting my literature review I identified gaps in literature regarding my clinical problem. For instance, there were few studies pertaining to suboptimal glycemic control related to little or lack of a self-management education program. There was also a low yield of results when the term self-management was used alone (Table 2).

TABLE 2. *Synthesis of literature.*

<b>Author / Article</b>	<b>Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question</b>	<b>Theoretical Framework</b>	<b>Design</b>	<b>Sample (N)</b>	<b>Data Collection (Instruments/Tools)</b>	<b>Findings</b>
Aponte, J., Jackson, T. D., Wyka, K., & Ikechi, C. (2017). Health effectiveness of community health workers as a diabetes self-management intervention.	Qualitative study  Research question: What is the effectiveness of community health workers (CHWs) intervention on type 2 diabetes control?	N/A	RCT Participants randomly assigned to one of three groups: CHW intervention group or one of two control groups.	English and Spanish speaking Hispanic males and females with uncontrolled T2DM (HbA1C > 8%) n=180	Diabetes Knowledge Questionnaire (DKQ)	A 1% or more reduction from start of study to 12 months in the intervention group.
Choi, S. & Rush, E. B. (2012) Effect of a short-duration culturally tailored community-based diabetes self-management intervention for Korean immigrants.	Qualitative study  Research question: Do culturally tailored programs yield improvements in glycemic control and outcomes?	N/A	Single group Pre -& Posttest cross-sectional design	n=58 total participants enrolled in study, n=41 actual participants who completed the study.	Tools: Self-management behaviors tool- Summary of diabetes self-care activity revised scale (SDSCA)  Diabetes knowledge- 14 item general diabetes test subscale from the diabetes knowledge test  Self-efficacy- Diabetes self-efficacy scale for cardiac patients	Mean HbA1C and waist-circumference measurements decreased and HDL levels increased and A1C decreased from 7.3% to 6.8%.  Self- foot examination frequency increased, frequency of exercise increased.  Satisfaction with culturally tailored community diabetes self-management program

TABLE 2 – *Continued*

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					Health status- The SF-12 survey an abbreviated version of the SF 36 health outcome study  Biological markers- HbA1C, blood pressure, lipids, BMI, waist circumference, waist-to-hip ratio	
Chomko, Odegard, & Evert, (2016). Enhancing access to diabetes self-management education in primary care.	Quantitative study  Research question: Do diabetes self-management programs offered in primary care clinics impact glycemic control and weight?	N/A	Single group pre- & post- test retrospective design	Type 1 or Type 2 adult diabetic patients who speak English language and able to attend DSME classes. n=64 Setting: Healthcare clinics in metropolitan Seattle area.	Data collection: A combined DSME intervention with or without dietician or RN involvement. DSME classes were evaluated. Classes conducted 3 times weekly for 2 hours duration. Classes were recurring every month. EMR utilized for data on DSME class attendance at least 1 time in last 10 mos. A1C measurements within 3 mos of class participation and within	Total of 64 participants received DSME. Of the 64 participants only 49 (77%) had baseline data to compare with post study data. Of those 49 participants, 42 (85%) of those patients had comparative data greater than 6 mos post study. Increased access to DSME classes in a community clinic setting attributed to increased participation/enrollment in DSME. Reduction in A1C values

TABLE 2 – *Continued*

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					<p>3 mos post class attendance. Baseline weight, weight at initial diabetes follow up appointment, 2<sup>nd</sup> diabetes follow up appointment, and within 6 mos within post study time frame. Data analysis: Primary data analysis using SPSS software consisted of comparing baseline A1C values and 3 month A1C values and baseline A1C values and 6 month post study A1C values when they were available.</p>	<p>and weight measures occurred at 3 &amp; 6 months post study. A1C values decreased by -1.1% at 3 mos post study Weight decreased by 1.6kg at 3 mos post study, with 85% of participants experiencing slight regain of weight at 6 mos post study. However, despite weight gain, overall weight loss compared to baseline remained significantly decreased. Newly diagnosed diabetic patients had greatest reduction in A1C but reduction in A1C &amp; weight were seen in patients with long standing diabetes as well.</p>
Dizdar et al., (2016) Assessment of factors related to the understanding.	Qualitative study  Concepts: Diabetes self-care	N/A	Prospective cross-sectional study	Type 1 & Type 2 DM, outpatient, 18 years or older, taking Diabetes	Diabetes self-care knowledge questionnaire (DSCCKQ-30) administered pre- and – post education.	Increase in correct responses in all components between, before, and after education session.

TABLE 2 – Continued

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
of education and knowledge of self-care among patients with diabetes mellitus: A cross-sectional prospective study	Research question: Does education on self-knowledge and self-care contribute to glycemic control?			meds for at one month n=364		Decline of 1.1% in HbA1C 3 mos post intervention. (avg 8.8% before and 7.7% post intervention)  Questions related to self-monitoring blood glucose levels, DM goals, and hypoglycemia symptoms had lowest correct response rate before education.  Married or active working participants demonstrated greater understanding of DM and self-care & mgmt.
Fitzpatrick et al., (2016) Effect of DECIDE (Decision-making Education for Choices In Diabetes Everyday) program delivery modalities on clinical &	Qualitative study  Concepts: Diabetes education delivery modality  Research question: What is the effect of each of the DECIDE modalities on	N/A	RCT  Participants were randomized into 3 groups of delivery modalities: Self-study, individual, group, and enhanced usual care	African Americans with T2DM, 25 yrs or older with HbA1C 7.5% or greater or HbA1C between 7-7.5%, suboptimal BP and lipid	Wide Range Achievement Test (WRAT-3)  Patient Health Questionnaire-2 (PHQ-2)  Health Problem-Solving Scale (HPSS)	Decline of 0.57% (p<0.05) in HbA1C between baseline and post intervention in all groups with participants with A1C 7.5% or higher  Decline in LDL in self-study, individual and usual care groups, self-study group had increase in HDL at 6 mos post intervention.

TABLE 2 – *Continued*

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
behavioral outcomes in urban African Americans with type 2 diabetes: A randomized trial	clinical and behavioral outcomes?			values. n=182	Diabetes and CVD Knowledge Test Summary of Diabetes Self-Care Activities Scale (SDSCA).	Self-study group demonstrated greater knowledge than usual care group, and all groups showed improvement in problem solving at 6 mos post study intervention.
Haesun, Thompson, Kreider, & Vorderstrasse (2017). Diabetes self-management quality improvement initiative for medically underserved patients	Quantitative study  Research question: To evaluate the impact of DSME intervention on glycemic control in medically underserved patients.	N/A	Pre- and – Post study experimental design.	Adult patients with diabetes and baseline A1C greater than 7% measured 4 months prior to the study who can read and speak English or Spanish and are without cognitive impairment. n=30 Setting: A FQHC in Northwest Chicago suburb.	Data collection: Baseline data: age, gender, insurance, ethnicity, language, insulin status, duration of diabetes, number of medicines, pre- and post A1C results and follow up visit adherence rates obtained from EHR. Data collected at 3 & 6 month f/u visits. Data analysis: SPSS software used for analysis. Paired t-test used to evaluate pre-and post-test A1C values post intervention.	Participants' self-management behaviors started out at low rate of adherence, but showed improvement from baseline to 3 month visit and 6 month visit.

TABLE 2 – Continued

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Herre, Graue, Kollveit, Beate-Christin, & Gjengedal, (2016) Experience of knowledge and skills that are essential in self-managing a chronic condition- a focus study group among people with type 2 diabetes.	Qualitative study  Research question: To gain a new understanding of the experience of participating in self-management classes with other attendees, influences on health and ability to self-manage their diabetes.	Framework based on concepts of knowledge and learning.	Phenomenography Five focus group interviews conducted to evaluate common experiences of diabetics in group education setting. Focus groups- 3-6 participants per group. Duration of focus group interviews- 67-86 min	n=22 Participants with T2DM who participated in group based self-management classes.	Data collection through 5 semi structured focus group interviews lasting 67-86 minutes with the 22 study participants  Data analysis- Recorded focus group interviews summarized by moderators, transcribed verbatim and analyzed using Knodel's method. Content divided into main themes and subthemes	Three main themes emerged: More distinct and specific knowledge, Learning in context, Suggestion for improvement. Additionally, several sub themes emerged. Overall findings: Increase in diabetes knowledge through group based class participation, reported increased self-management skills after participation in group based classes. Participants found group based setting led by DM professionals beneficial. Participants expressed desire for class material accessibility in online format.
Hsu, C. & Tai, T. (2014) Long-term glycemic control by a diabetes case-	Qualitative study  Concepts: case management intervention	N/A	RCT	Participants randomized into case-management intervention	Mixed model analysis used to assess the case management intervention effects on HbA1C results between	Groups with Case management intervention showed greater improvement in HbA1C (decline of 0.7%) than the

TABLE 2 – Continued

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
management program and the challenges of diabetes care in Taiwan	Research question: What are the long-term effects on glycemic control of a case management-led diabetes care program and challenges in quality of care in Taiwanese diabetics?			group and control group n=1060	the intervention and control groups.	control group (decline of 0.2%) at 6 mos post study and sustained glycemic control through the 3-year intervention period.
Nicoll, K. et al., (2014). Sustainability of improved glycemic control after diabetes self-management education	Quantitative study  Research question: To evaluate diabetes control over a 2-year period after receiving diabetes self-management education.	N/A	Retrospective study	Adult diabetic patients who completed DSME and received routine medical care for at least 2 years after participation. n=43 Setting: Outpatient medical center in Tennessee. Participants	Data collection: DSME attendance, medical follow up visits and A1C measurements before, during and in the 2 years after attending DSME program obtained through EHR. Baseline demographic information: self-reported education level, insurance, coverage, and duration of diabetes also collected through EHR. Data analysis: SAS	Diabetic participants with dx of DM less than 1 year had more of a reduction in mean A1C values (28.7% reduction) and able to sustain glycemic control up to 2 years post DSME compared to those with dx of DM 1 year or greater (20.2/7% reduction). Overall, the mean A1C before DSME was 10.2%. Post DSME mean A1C was 7.8% and remained unchanged at year 1 and 2

TABLE 2 – *Continued*

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				stratified into 2 groups: diagnosis of DM less than 1 year and diagnosis of DM for 1 year or greater.	software used for statistical analysis.	post study.
Ogunrinu, T., Gamboa-Maldonado, T., Ngewa, R. N., & Saunders, J. (2017) A qualitative study of health education experiences and self-management practices among patients with type 2 diabetes at Malamulo Adventist Hospital in Thyolo District, Malawi	Qualitative study  Research question: What are the perceptions and experiences of health education and self-management in type 2 diabetics treated at Malamulo Adventist Hospital?	Health Belief Model	Exploratory study phenomenology qualitative study design	>18 years old Type 2 diabetics treated at Malamulo hospital at least once n=20	Grounded theory methods. Key informant interviews and focus group discussions audio recorded, transcribed, and translated.	Participants demonstrated positive regard for DM classes, expressed ability to incorporate DM education into lifestyle, identified that financial restraints greatly impacted medication compliance and nutrition, and expressed self-efficacy in controlling glucose levels but felt they had limited knowledge about diabetes complication.

TABLE 2 – *Continued*

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Peros, James, Nolan, & Meyerhoff (2016). Diabetes self-management education (DSME) program for glycemic control.	Qualitative study  Research question: Does the diabetes education program (DEP) impact clinical outcomes, disease management, ability to manage diabetes, and quality of life?	Iowa Model	Prospective cohort study	Adults with T2DM, Primary care clinic in Southern California n=5	Iowa Model used Data collection occurred over 4 mos. Interpretation of data based on ADA standards of care for glycemic control. Descriptive statistics used to evaluate the percentage of patients able to maintain glycemic target of HbA1C 7% or lower.	Post diabetes self-management program implementation HbA1C levels improved by a mean of 1.44%. 20% of participants met glycemic goal of HbA1C <7%. All participants had 10% decrease in HbA1C after attending program.
Schwennesen, Henricksen, & Willaing, (2016). Patient explanations for non-attendance at type 2 diabetes self-management education: a qualitative study.	Qualitative study  Research question: To explore the explanations of diabetic patients who were referred to DSME program but did not attend.	N/A	Phenomenological	Adult diabetic patients in Southern Denmark who were referred to diabetes self-management education at a local hospital. n=15	Data collection: 15 semi-structured telephone interviews. Data analysis: Systematic text condensation to code and develop themes. 2 themes generated: Individual explanation for non-attendance & Organizational explanation for non-attendance.	Individual reasons for non-attendance were illness and perceived lack of benefit in attending class. Organizational reasons for non-attendance were scheduling conflicts (time/day), and the content covered in DSME.

TABLE 2 – Continued

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Smith-Miller, C. A., Berry, D. C., DeWalt, D., & Miller, C. (2016) Type 2 diabetes self-management among Spanish-speaking hispanic immigrants	Quantitative study  Research question: Can diabetes self-management education interventions improve health outcomes in Spanish speaking type 2 diabetics?	Social cognitive theory	Mixed methods study	Adult diabetic patients who speak Spanish language.  n=30	Short Assessment of Health Literacy for Spanish-Speaking Adults (SAHLSA) tool, Diabetes Knowledge Test (DKT)	SAHLSA results demonstrated participants had adequate literacy levels.  DKT scores were low, participants felt confident in ability to control diabetes but less confident in exercise and eating habits.
Sperl-Hillen et al., (2013) Are benefits from diabetes self-management education sustained?	Quantitative study  Research question: To evaluate the sustainment of positive outcomes related to diabetes self-management education in patients with suboptimal glycemic control.	N/A	RCT	Adult patients diagnosed with type 2 diabetes with A1C of 7 or greater in the last 6 mos. Setting: Albuquerque, NM, Minneapolis, MN. Participants Randomized into 3 groups: Individual education,	Data collection: All participants received surveys at 1,4, 7, and at 10 mos post study. Surveys measured: patient demographics, Diabetes Empowerment Survey (DES), Problem Areas In Diabetes (PAID), Recommended Food Score (RFS), PHQ-9 depression module, physical activity and nutrition. A1C results collected through EHR.	Individual education resulted in improved DES & PAID scores long term, but not in RFS and physical activity outcome measures. A1C declined more in individual education than group education or usual care groups 150 days post study. Individual education group demonstrated sustained improvement in areas of self-efficacy & decreased distress, but short-term improvements in A1C,

TABLE 2 – *Continued*

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				group education and usual care without education. n=623 Participants underwent 3- 1 hour education sessions delivered by nurse or dietician each month.	Medication data obtained through medical claims and number of diabetes education visits by surveillance of patient visit codes for education visits. Data Analysis: SAS software.	physical activity & nutrition were not sustained.
Whitehead et al., (2016) A nurse-led interdisciplinary approach to promote self- management of type 2 diabetes: a process evaluation of post intervention experiences	Qualitative study  Research question: How acceptable is the nurse-led interdisciplinary approach to promote self- management in type 2 diabetes?	N/A	RCT Study participants randomized to one of two intervention groups: education group and education plus acceptance, & commitment therapy group	Adults diagnosed with T2DM for at least 1 year or more n=73	Semi structured interviews at 3 & 6 months post study	Participants demonstrated increased knowledge in diabetes self-management, increased self- responsibility

TABLE 2 – *Continued*

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Urowitz et al., (2012) Improving diabetes management with a patient portal: Qualitative study of a diabetes self-management portal	Qualitative study  Research question: Is the patient portal an effective tool in diabetes self-management?	N/A	Cross-sectional	Adult diabetic patients n=887	A 5-item, open-ended questionnaire	Patient satisfaction with patient portal, viewed as a valuable tool due to increased access to health records, awareness, and engagement in their healthcare. Less favorable among providers Frequency of use low among both patients and providers
Vanderbosch et al., (2018). The impact of health literacy on diabetes self-management education	Quantitative study  Research question: Does diabetes self-management education have different outcomes depending on the health literacy level?	N/A	Observational Pre- & -Post study	Diabetic adult patients from 9 countries, newly diagnosed and enrolled in existing DSME program in one of the 9 countries. Participants underwent one of four modes of education delivery:	Data collection: Questionnaires collected at baseline and 3-6 mos after program. Telephone interview or online questionnaire used for 3-6 mos follow up. General health literacy levels assessed using Health Literacy Survey Questionnaire. 3 groups of outcome measures: diabetes health literacy, self-	Overall DSME had positive effect on self-management regardless of health literacy level. Participants with high health literacy levels had higher scores on health outcomes vs those with low health literacy levels. All participants viewed DSME as beneficial. Individual education and group-based education modes had more of a positive effect on self-

TABLE 2 – *Continued*

Author / Article	Qualitative: Concepts or phenomena Quantitative: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				Individual, group-based, web-based, and self-help/peer led.	management behaviors, & psychological health outcomes. Data analysis: Repeated measures multivariate analysis of variance (MANOVA) performed for the three groups of outcomes.	behaviors and psychological outcomes vs self-help/peer led education modes.

Successful management of diabetes has been shown to improve glycemic control, reduce risks of diabetes-related complications, improve quality of life, and improve patient satisfaction outcomes (Beck et al., 2016). Diabetes self-management education is affirmed in the literature as a valuable tool in the development of knowledge, skills, and self-efficacy necessary for diabetes management (Powers, 2017). Current literature also supports the implementation diabetes self-management education and services that are evidence-based, ongoing, culturally appropriate, cost-effective, patient-centered, and individualized, thus incorporating the patient's needs, priorities, and concerns (Chrvala, Sherr, & Lipman, 2016). Furthermore, much of the current literature on diabetes self-management education consider it to be a critical factor in producing positive outcomes. These outcomes are glycemic control (A1C), quality of life, patient satisfaction, utilization, and costs. Moreover, current literature has endorsed diabetes self-management education as one of many effective interventions that improve outcomes and decrease risks of mortality and morbidity (Sadler et al., 2017).

## **METHODOLOGY**

### **Design**

I employed a descriptive method using qualitative and quantitative data to achieve the overall goals of the project to assess whether the project site's existing diabetes self-management education program meets evidence-based guidelines for diabetes self-management education programs, assess the potential variables that reflect the current diabetes self-management program such as the rate of utilization (number of classes attended) and glycemic outcomes (A1C results) among participants, and survey the self-management class participants and class

facilitators to obtain their perceptions about the existing program, barriers and facilitators to class attendance, and ideas for program improvement. The project timeline is presented in Table 3.

TABLE 3. *Project timeline.*

<b>Project Activity</b>	<b>Task</b>	<b>Projected Date</b>
Meet with organizational stakeholders	Discuss organizational needs and priorities for quality improvement.	October 2018
Meet with clinical informatics specialist	Discuss plan for obtaining reports on patients who have attended diabetes self-management classes and have A1C results of less than 7%. Determine if this is feasible.	August- November 2018
Attend 2-3 diabetes self-management classes	Explain the project, recruit eligible participants, and distribute surveys	October 2018
2 <sup>nd</sup> Meeting with clinical informatics specialist	Collect data on study participants who completed the surveys: Demographics, A1C values and class attendance	November 2018
Data analysis	Construct graph for quantitative data analysis and content analysis for qualitative data analysis	November 2018
Disseminate project results	Construct and present an executive summary to stakeholder group: Internal Medicine providers and organization's leadership team	December 2018

### **Setting**

The project setting was a large community health clinic that is classified as a Federally Qualified Health Center, serving adult patients ages 18 years and older. The clinic was one of five clinics within the organization and is located in an underserved area in the greater metropolitan area of Phoenix, offering medical services to patient and families across the lifespan. The clinic utilized an integrative medicine approach in which health education and counseling was also provided by registered dietitians, behavioral health consultants, in-house clinical pharmacists, and a diabetes community health worker designated as *La Promotora*.

Within the entire organization, 80,000 patients receive health care at one of the organization's five clinic sites. Approximately 52.42% of those patients are adults who receive care in either internal medicine or family medicine departments. The minority population comprises a large percent of patients who receive care at the clinic with over 70% being Hispanic/Latino ethnicity, with Spanish being the primary and preferred language, 16.56 % being Black/African American, and 1.70% Asian ethnicity. As a whole, the organization's percentage of patients with diabetes is 16.72%, with over 23% of the clinic's diabetic population having A1C measurements greater than 9%, demonstrating poor glycemic control. The clinic houses a pediatric department, women's health department, and an adult internal medicine department in where the type 2 diabetes self-management classes are held and where the project was conducted. The internal medicine department treats 4,188 adult patients. Of the 4,188 patients served, 3,463 patients (82 %) have a diagnosis of type 2 diabetes. The department employs 14 medical providers, consisting of nurse practitioners, a physician assistant, and physicians. Furthermore, the internal medicine department utilizes a patient-centered medical home model to deliver patient care.

The project site's current practice involves face-to-face group-based diabetes self-management classes. In this clinical setting, no other delivery methods are used for diabetes self-management education. Class attendance is variable month to month, with less attendance during the summer months. Additionally, patients attend diabetes self-management classes voluntarily, and are able to attend as many or as little classes as they choose. Currently, little is known about the effectiveness of the current diabetes self-management program in this clinical setting, which is the reason this project was undertaken.

### **Sample**

The sample was 20 male and female adult patients aged 18 and older, diagnosed with type 2 diabetes, and who attended self-management classes in 2018 between the months of May, June, and July. Both diabetes self-management class participants and the class facilitators were recruited for the project survey.

### **Intervention**

This project did not include a new intervention, but an evaluation of existing ongoing diabetes self-management education classes conducted at the clinic every week.

### **Measures**

The project measures included: class attendance, which involved assessing the number of times the participant attended self-management classes in 2018 between the months of May, June, and July. Glycemic control was another study measure and was assessed by obtaining hemoglobin A1C values. Additionally, class participant and class facilitator survey responses and the diabetes education content provided in self-management classes was measured.

The class participant survey consisted of eight questions, four of which were structured questions and four open-ended questions. The class facilitator survey consisted of five open-ended questions. The purpose of the survey was to assess the relationship between class attendance and glycemic control. The survey measured the level of satisfaction with the project site's existing practice of face-to-face group-based self-management education, barriers to class attendance, and achieving glycemic control, and whether or not change to the existing self-management program was desired among stakeholders.

### **Data Collection**

Data on diabetes self-management education class content was obtained by reviewing the literature in evidence-based guidelines on diabetes self-management education curriculum. I then compared the literature to the project site's existing self-management class curriculum.

The clinic's informatics data analysts were enlisted to gather data on clinic patients 18 years or older with a diagnosis of type 2 diabetes documented in the electronic medical record. Adult type 2 diabetic patients who participated in one or more diabetes self-management class in 2018 between the months of May, June, and July were included in the data collection process. Additionally, among those who met the aforementioned criteria, those who also had a documented A1C result that was obtained after the last class attended during the months of August, September, and October, 2018 were included in the data collection process. The hemoglobin A1C values for these patients were obtained through clinical quality reports and the electronic medical record as well. I am 1 of 14 medical providers in the department. Therefore, I had communal access to all adult medical records of established patients in the internal medicine department. Thus, accessing the electronic medical records of patients other than those in my own patient panel was not a new or unusual practice.

I attended two of the project site's diabetes self-management education classes over the course of one month to recruit project participants. A goal to obtain 20 completed participant surveys and three class facilitator surveys were set prior to collecting the data. The diabetes self-management class participants and class facilitators were asked to complete and return a survey about their perception of the self-management classes after agreeing to verbally participate in the project. Participation in the survey was voluntary and this was communicated during the

recruitment process. Before distribution of the survey to the project participants, the disclaimer was reviewed. The purpose of the disclaimer was to inform participants that their self-management class attendance, hemoglobin A1C values, and survey responses were confidential and that I would use their identity to look further into their electronic medical records.

The project survey was distributed to class participants during in the last 10 minutes of the class, without the class facilitators being present. The surveys were then collected, and later evaluated after the class ended. The self-management class facilitators were surveyed separately on a different day and time, independent from self-management class participants. The data obtained from this project will be presented to the larger organization to communicate whether there is a need for program improvement, then the work of developing quality improvement strategies using the Plan-Do-Study-Act (PDSA) can begin (Finkelman, 2018).

### **Data Analysis**

A descriptive analysis of the quantitative data based on the electronic health records reviewed for demographic data such as average age of project participants, number of participating males and females, average number of self-management classes attended among the sample, and hemoglobin A1C values was performed. The data was then depicted in a table (Table 3). Qualitative data was obtained through the surveys distributed to the project stakeholders. This data was in narrative form and subjective, thus providing a better understanding of the perceptions of the current self-management education program effectiveness and barriers that exist related to self-management and the attainment of glycemic goals. (Polit & Beck, 2017). Three sets of data were analyzed: 1) the number of classes attended and A1C results; 2) the survey responses of self-management class attendees and the survey

responses of the self-management class facilitators; and, 3) evaluation of class content/program curriculum compared to evidence-based guidelines to determine if existing classes are meeting criteria for delivering self-management education.

Analysis of responses to the open-ended questions consisted of performing a content analysis. The analytic approach of content analysis involved taking the narrative data obtained and totaling the number of themes that emerged from the survey responses, and then condensing it into smaller categories of content (Polit & Beck, 2017). The themes will be shared in an executive summary at the culmination of this project.

### **Ethical Considerations**

#### **Respect for Persons**

Respect for persons participating in this project was upheld through rights to self-determination and full disclosure. Participation in the study was voluntary and it was communicated to participants that at any time they “have the right to ask questions, to refuse to give information, and to withdraw from the study” (Polit & Beck, 2017, p. 140).

#### **Beneficence**

This quality improvement project is beneficial in that the data obtained on the relationship between the current self-management diabetes education program and glycemic control could aid in the decision of continuing with the current practice or change the self-management education delivery methods.

#### **Justice**

The recruitment process for the project targeted the diabetic population and the efficiency of the self-management education program currently in place in the clinic in which the patients

are treated. The project also sought to gain understanding in the reasons why patients choose to participate in the self-management education program, barriers to attending the program, and suggestions for improvement that may yield an increase in participation.

## **RESULTS**

### **Aim 1: Comparison of Existing Program to Evidence-Based Standards**

Of the 10 national Standards for diabetes self-management education programs, the clinic in which the project took place met all but four Standards: Standards 2, 8, 9, and 10. Standard 2 is titled *Stakeholder Input*. Currently, only the self-management class facilitators and directors of clinical quality and integrated services provide input on the program's structure and curriculum. Thus, input regarding the class curriculum and content is not provided by the class attendees.

Standard 8 is *Ongoing Support*. The current program consists of classes conducted in a face-to face group setting. The classes are held in the facility's conference room in which a large dry-erase board and printed education materials in English and Spanish languages are used to deliver education. Currently, there are no additional methods of delivery for diabetes self-management education and services utilized by the clinic. After completing the four-week series of self-management classes, patients have the option to continue attending the series of classes that repeat for 11 months of the year or solely see their primary care provider for usual diabetes office visits in which the offering of continued education and support is at the discretion of the medical provider. The average number of hours of diabetes self-management education completed by the participants was 7.35 hours. While a significant benefit of diabetes self-management education is an improvement in A1C outcomes, literature suggests undergoing

more than 10 hours of self-management education increases the likelihood of this occurring (Chrvala, Sherr, and Lipman, 2016).

The next standard that the current program did not meet is Standard 9 (*Participant Progress*). In the current program, the A1C results of patients who participate in the diabetes self-management classes is not tracked at the start of classes, throughout, and at the completion of the four-class series and/or subsequent class completion. Instead, the A1C measures of class participants and non-participants are tracked by the patients' medical providers during their usual diabetes care appointments.

Standard 10 is *Quality Improvement (QI)*. QI is defined as a strategic, ongoing process of evaluation of outcome measures to determine if and how the diabetes self-management program is effective. The current program does not have any defined strategy for continuous quality improvement measures. The director of clinical quality and director of integrated services meet annually to devise plans for the year's diabetes self-management education program and services but there is no mention of periodic quality improvement efforts beyond the annual meeting.

Currently there are no formal process and outcome data measurements conducted on a continuous basis within the clinic. What has been conducted is how the organization as a whole is meeting national benchmarks and rankings within the state of Arizona compared to other FQHC's. Current program evaluation based on class participants' results had not been conducted before. Therefore, this was one of the project aims.

### **Aim 2: Evaluation of Current Diabetes Self-Management Program**

The sample comprised 20 adult diabetic patients. Descriptive statistics were used to analyze the demographic characteristics of the sample population (Table 4).

TABLE 4. *Demographic characteristics of the sample population.*

	<b>Mean</b>	<b>Range</b>
Age	60.7 yrs. old	37.48-83.68
Number of classes attended	7.35	1-28
A1C	8.7	6.0-12.6

The majority of class participants were female. Seventy-five percent (n=15) were women, while 25% (n=5) were male. The mean age of the sample was 60.7 years of age, and the mean number of diabetes self-management classes attended were 7.35. Furthermore, the mean A1C result was 8.7%, with only 10% (n=2) of the sample meeting the criteria for controlled diabetes demonstrated by an A1C value of less than 7% (ADA, 2018). Among the sample, most exhibited poor glycemic control (evidenced by A1C values greater than 7%).

### **Aim 3: Evaluation of Program Perceptions, Barriers and Facilitators**

The final goal of this project was to evaluate the perceptions of class participants and class facilitators. Of the 20 participant surveys distributed, only 11 surveys were completed and returned. Three facilitator surveys were completed and returned by one registered dietician, one behavior health consultant who is a clinical psychologist, and the project site's diabetes community health worker, *La Promotora*. The survey responses were analyzed using both descriptive statistics and content analysis. These are discussed below.

#### **Satisfaction with the Current Diabetes Education Program Offered at the Project Site**

Seven participants (64%) chose the response “strongly agree” and four (36%) participants chose “agree.” There were no participant responses for “I don’t know,” “neutral,” “disagree,” and “strongly disagree.” The mean score of the satisfaction survey item was 4.6. Thus, most participants were satisfied with the current class.

### **Confidence in what was Learned in the Current Diabetes Classes Helped Participant Successfully Self-Manage His/Her Diabetes**

Six participants (55%) chose “strongly agree,” while five (45%) participants chose “agree.” There were no participant responses for “I don’t know,” “neutral,” “disagree,” and “strongly disagree.” The mean score of the confidence survey item was 4.5. Confidence in what was learned was high in this sample.

### **A1C Improved as a Result of Diabetes Self-Management Class Participation**

Four participants (45%) chose “strongly agree,” while, five (45%) participants chose “agree.” Two (18%) participants chose “I don’t know” as a response. There were no responses for “neutral,” “disagree,” and “strongly disagree.” The mean score of improvement in A1C as a result of attending a diabetes self-management class was 4.7, indicating most participants believed participation did help with maintaining A1C levels.

### **Preferred Method of Education**

Most (81%) of class participants rated their the most preferred method of education was the face-to-face group based classes as they are currently conducted (n=9). Two class participants did not rate their most preferred method of education. Some 81% of class participants rated the web-based method as their least preferred method (n=9). And 9% of class participants rated recorded education materials as the least preferred method of education (n=1). One class participant chose his/her most preferred method of education only and did not rank the preference of the additional methods of education (n=1).

**What participants liked *best* about the current diabetes classes.** Four participants responded that they enjoy being provided with information about diabetes self-management.

Two participants responded that they like “everything” about the classes. One participant liked the education provided on the measurement of food portion sizes. Two participants responded that they enjoyed the self-management class facilitators and two participants did not answer the question.

**What participants liked *least* about the current diabetes classes.** Eight participants answered “none,” while three participants did not answer the question. The participants were then asked “What improvements do you suggest to the current diabetes education classes”? Four participants suggested adding an exercise segment to the classes would be helpful. Four class participants answered “none,” and three participants did not answer the question.

**Barriers and facilitators to attending the self-management classes.** Two participants listed transportation as a barrier, one participant listed the time of day the classes are held as a barrier, and five participants answered with “none.” Two participants felt the distance between the clinic where classes are held and their home was a barrier to class attendance. One participant felt other appointments that conflict with the self-management class times were barriers to attending the classes. There were only four participant survey responses to the question about the perceived facilitators to attending the self-management classes. The opportunity to socialize with others, being given vouchers to a local farmer’s market, and transportation assistance were considered facilitators to attending self-management classes among the participants.

**Class facilitators and community health worker’s evaluation.** The most enjoyable features of the classes were the interaction with the class participants and opportunity to discuss components of self-management: medication, nutrition, exercise, and behavior change. All three facilitators responded that they enjoyed when patients ask questions, which demonstrated that

they were engaged. The least enjoyable feature of the classes among two of the class facilitators were the time restraints. All three of the class facilitator surveys indicated that a lack of transportation and the time and day the classes are offered were barriers to attending self-management classes. Two of the three class facilitator surveys listed a lack of motivation to manage diabetes, language, cognition, and low literacy levels as perceived barriers to self-management class attendance. Two of the class facilitators provided responses to the question about perceived facilitators to attending the self-management classes. The face-to-face group-based education format, the open invitation for family/support system to attend classes, and classes offered in both English and Spanish languages were the responses.

Recommendations for improvement were similar to participant responses in that the class facilitators also suggest adding an exercise segment and a cooking demonstration to the existing self-management class structure. Additionally, the class facilitators identified five more suggestions for improvement to the current self-management education program. One suggestion is to obtain more support from the medical providers through referrals to attend class and by encouraging patients to attend self-management classes. Incorporating medical providers into the diabetes self-management class schedule to speak with participants from a medical provider standpoint was another suggestion the class facilitators had.

Furthermore, the class facilitators felt more marketing of the self-management classes within and outside of the clinic was needed to increase utilization. They felt offering text message reminders about upcoming classes and text message invitations to attend class were good strategies to increase utilization. Finally, the class facilitators suggested offering a diabetes support group to address depression and coping, diabetes complications, and/or support for

newly diagnosed diabetics would be valuable to the project site's existing diabetes self-management program.

All of the class facilitators thought that the current classes improved disease knowledge, lifestyle changes, and engagement in managing diabetes. The class facilitator responses regarding the relationship between class attendance and reaching glycemic goals (A1C) after attendance were listed as "unknown." This could be because the project site has not performed any tracking of participant A1C outcomes before, during, and after attending self-management classes over a specific period of time.

In summary, the main findings of this study indicate that while the class participants are generally satisfied with the existing self-management program, the existing program could benefit from continuous quality improvement efforts. The National Standards (Standards), demographic data, and survey responses helped to identify the need for program restructuring. Quality improvement strategies could improve the existing program's effectiveness, as demonstrated by the number of participants who obtain and sustain glycemic control, yield support from medical provider stakeholders, and result in progress toward meeting all of the evidence-based Standards for diabetes self-management education and support.

## **DISCUSSION**

### **Strengths**

A significant strength of this project were the class participants' positive perceptions about the project site's existing self-management class. The participants also felt encouraged by the self-management classes and are pleased with the current practice of face-to-face group based classes. An additional strength was that the project participants were reflective of the

diabetic population that are established at the clinic (project site). The 20 participants were a good first cycle and lends opportunity for subsequent program evaluation with a larger sample if desired and/or necessary. The buy-in from the participant and class facilitator stakeholders, the clinical informatics stakeholders, and the project site's medical director were added strengths. Lastly, the evaluation of the project site's existing diabetes self-management education program revealed areas for improvement. One of which is the implementation of a continuous quality improvement process. Continuous quality improvement also allows for the identification of problems or gaps in care, an opportunity to improve or make changes, and then implementation of the new interventions. According to current literature, an additional benefit of continuous quality improvement is that it facilitates the sustainability of the program on a long term basis (Ogunrinu et al., 2017).

### **Limitations**

The exclusion of systematic reviews and studies that did not demonstrate a relationship between self-management education and glycemic control was a significant limitation in my review of literature. Expanding my inclusion criteria could have resulted in studies that found that diabetes self-management education does not make a difference in the outcomes resulting in a broader literature review.

Because the current classes are conducted once weekly, survey distribution was limited by the frequency of classes. Poor class attendance resulted in fewer surveys completed and returned. Therefore, it was necessary to attend classes for two consecutive Wednesdays to distribute the surveys. Survey completion was limited by language and literacy. Class participants who were illiterate, had low literacy levels, or unable to read the survey in English

were less likely to complete and return the survey. Additionally, I did not assess diabetic patients who do not attend the self-management classes. Therefore, the perceptions on the project site's existing self-management classes is only reflective of the small sample.

An additional limitation is the lack of participant and provider stakeholder input in the structure and development of the current diabetes self-management class. Input regarding the class curriculum and content is needed from both the provider stakeholders as well as the diabetes self-management class participants. Co-action between the providers and the participant stakeholder groups in the continuous quality improvement process allow for effective change to occur (Finkleman, 2018). Additionally, there is supporting evidence that the inclusion of provider and participant stakeholders in quality improvement efforts increase engagement, improve the quality and sustainability of the program, and improves outcomes (Beck, et al., 2017). Thus, continuous efforts to keep patients engaged as well as recurrent referrals from their medical providers to participate in self-management classes at critical time points are key to sustaining positive outcomes (Beck et al., 2017).

Continuous quality improvement also allows for the identification of problems or gaps in care, an opportunity to improve or make changes, and implementation of the new interventions. According to current literature, an additional benefit of continuous quality improvement is that it facilitates the sustainability of the program on a long term basis (Ogunrinu et al., 2017).

### **Practice Implications**

The relationship between the number of classes attended and the acquirement, retention, and application of self-management skills to achieve glycemic control could not be determined. Additionally, it is difficult to make practice recommendations based on the results of this project

because of the aforementioned project limitations. Future implications for program evaluation should include the clinical measure of the A1C value, operational measures such as participant satisfaction with the self-management program offered and process measures such as program utilization rates. Provider and patient stakeholder input should be sought and incorporated into the plan for continuous quality improvement. Additionally, the correlation between class utilization and meeting glycemic targets (A1C) should be carried out over a 3- to 6-month time period or longer to evaluate if glycemic control can be sustained. Finally, attention should be given to the project site's program barriers. Quality improvement strategies to address the identified barriers (transportation, class time, & day) may increase program utilization, increase stakeholder engagement, and improve outcomes among the clinic's larger diabetic population. At the completion of this project an executive summary containing the project purpose, findings, evidence-based recommendations, and practice implications will be made available to clinic stakeholders in print and electronic (email) sources. Furthermore, a PowerPoint presentation will take place during a regularly scheduled medical provider meeting at a mutually agreed upon time.

### **DNP Essentials**

The American Association of Colleges of Nursing (AACN) developed the Essentials of Doctoral Education for Advanced Nursing Practice that comprise the competencies that should be integrated in the Doctor of Nursing Practice (DNP) degree program curriculum. The DNP Essentials encompass what the AACN deems necessary for the doctoral prepared Advance Practice Nurse to practice at the highest level of expertise. Throughout my degree program I have met the DNP Essentials by mastering the skill of translating research into practice

(Essential I). I have also learned how to influence health policy and health care reform through advocacy and activism in an effort to meet the needs of the population served (Essential V). Additionally, I have acquired knowledge in the principles of transformative leadership, and can now apply those leadership principles to quality improvement efforts at the organizational and systems level (Essential II).

Furthermore, my DNP program has taught me the importance of participating as a member of the inter-professional team, through which current practices and ongoing measures are assessed and implemented from a multidisciplinary approach to provide safe and quality care (Essential VI). Finally, my doctoral education has prepared me to meet the Essential of Advanced Practice Nursing (Essential VIII), which has equipped me to lead in identifying, developing, implementing, and evaluating care delivery models, evidence-based standards of care, and quality improvement initiatives. All of which are necessary in today's complex healthcare system to improve patient care, patient outcomes, and advance the nursing profession.

### **CONCLUSION**

In conclusion, an evaluation of the project site's diabetes self-management education program was conducted. The project site met 6 out of 10 National Standards for diabetes self-management education programs. The project findings revealed that although the self-management classes are highly utilized, the participants demonstrated poor glycemic control. Furthermore, it was revealed that the diabetes self-management class participants were satisfied with current program and the current method of education delivery which are face-to-face group-based classes. The participants were less receptive to changing the method of education delivery, especially to that of a web-based format. Barriers to class attendance were identified as lack of

transportation and the location and time of day the classes are held. The facilitators to class attendance were transportation assistance and receiving vouchers to obtain fresh fruits and vegetables from the local farmer's market. The survey responses among the diabetes self-management class facilitators revealed they enjoyed the opportunity for participants to ask additional questions. The class facilitators disliked the limited class offerings in English and the class time restraints. Both the class participants and class facilitators feel the addition of exercise and cooking demonstrations could be beneficial to the current diabetes self-management education program.

The project findings also reveal a lack of ongoing support offered to class participants beyond their completion of the diabetes self-management classes. Ongoing support and services for diabetes self-management that encompass a variety of education methods is deemed necessary and supported by the evidence (Beck et al., 2017). In the project site's existing self-management program, documentation of participant progress is lacking. A plan for tracking both participant and the program's progress towards specific goals should be implemented. Doing so will provide valuable data on the effectiveness of the self-management education program based on its impact on patient outcomes. Lastly, continuous quality improvement efforts should be undertaken to identify ongoing gaps in the diabetes self-management education services offered and utilized, and to identify areas of improvement. The development of strategies for marketing and improvement in participant/provider engagement in diabetes self-management are two specific areas that may benefit from implementing a continuous quality improvement process.

APPENDIX A:  
PARTICIPANT AND CLASS FACILITATOR SURVEYS

Disclaimer: Your participation in this project is voluntary and confidential. No personal information will be collected. The survey results are strictly for quality improvement of the diabetes self-management education program. There is no penalty if you decline to complete this survey. Should you decline to participate, you will still be entitled to utilize resources and services offered by the clinic. You may skip any question that you choose not to answer or do not understand. Your individual survey responses will not be shared with the diabetes educators, your primary care provider, or integrated services provider.

Instructions: Please circle the number below that best corresponds to your opinion of the diabetes education program here.

1. As a whole, I am satisfied with the current diabetes education program.

<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>	<b>I don't know</b>
1	2	3	4	5	6

2. I am confident that what I have learned in the diabetes classes has helped me manage my diabetes successfully.

<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>	<b>I don't know</b>
1	2	3	4	5	6

3. I have seen improvement in my diabetes control (Hemoglobin A1C test) as a result of my participation in diabetes classes.

<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>	<b>I don't know</b>
1	2	3	4	5	6

4. What is your preferred method of receiving diabetes self-management education? Rank in order of preference. Place the number 1 next to your most preferred method of education, the number 2 by the next preferred method of education and so forth.

\_\_\_\_\_ Face-to-Face group setting, as it is now

\_\_\_\_\_ Web-based through the patient portal on computer, tablet, or smartphone

\_\_\_\_\_ Recorded for listening at home

\_\_\_\_\_ Printed diabetes education packet to read on my own in my preferred language

5. What do you like best about the current diabetes classes?
6. What do you like least about the current diabetes classes?
7. What improvements do you suggest to the current diabetes education classes?
8. Is there anything that interferes with you attending the classes? Anything that helps you attend classes?

Disclaimer: Your participation in this project is voluntary and confidential. No personal information will be collected. The survey results are strictly for quality improvement of the diabetes self-management education program. There is no penalty if you decline to complete this survey. You may skip any question that you choose not to answer or do not understand.

1. What do you like best about the current diabetes classes offered?
2. What do you like least about the current diabetes classes offered?
3. What are some barriers and facilitators that influence class attendance?
4. What improvements do you suggest to the current diabetes education classes?
5. Do you feel the current diabetes self-management program is effective in producing positive outcomes (A1C at goal) among class participants? Why or why not?

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