

A DNP PROJECT

Diabetes Education to Reduce Readmissions of Patients with Diabetes

Jacksonville University

In partial fulfillment of the requirements

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By

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Abstract

Hospital readmissions by patients with diabetes rise due to known risk factors such as lack of a healthy diet, physical activity, aging and obesity (Sonmez, Kambo, Avtanski, Lutsky, & Poretsky, 2017). Diabetes education and management is key to improving self-care behaviors and reducing hospital readmissions within 30 days (Drinic et al. 2017 & Sullivan & Alexander, 2019). Diabetes self-management involves education on healthy diet, exercise, self-monitoring of blood glucose, avoidance of risk factors and complications (Chai et al., 2018). Hospitalization provides an ideal time to identify barriers to improving a diabetes home regimen and promote DSME (Inpatient Diabetes Management, 2016).

The purpose of this quality improvement (QI) project was to provide evidence-based diabetes education to adult hospitalized patients with diabetes, evaluate self-management behavior post discharge, and determine the 30-day readmission rate. Diabetes education took place at the bedside for 30 minutes prior to hospital discharge. A convenience sample 15 patients participated in the DNP project. A pre- and post-questionnaire designed to assess patient knowledge of diabetes education was administered. The patients were evaluated at 30 days post discharge for readmission. The project results revealed that there was a zero percent readmission rate and there was improved diabetes self-management knowledge and adherence. This DNP QI Project demonstrated the implementation of evidence-based diabetes education prior to discharge from the hospital can reduce hospital 30-day readmissions.

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Diabetic Education to Reduce Readmission of Patients with Diabetes

The Center for Disease Control and Prevention (CDC) reported in 2014 that 29.1 million of the population in the United States had diabetes (“Centers for Disease Control (CDC)”, 2014). This number is expected to rise due to risk factors such as lack of physical activity, aging, obesity and urbanization. Diabetes is a known risk factor for increased hospital readmissions (Sonmez, Kambo, Avtanski, Lutsky, & Poretsky, 2017). The lack of inpatient diabetes education prior to discharge contributes to diabetes 30-day hospital readmissions. According to the CDC, only 65% of hospitalized patients overall receive education upon discharge (“CDC”, 2016). Moreover, despite the fact that diabetes education is covered and billable under Medicare and Medicaid, as well as most private insurances, only half of patients with diabetes receive diabetes education. This calls for an initiative to teach more diabetes patients about their chronic disease and self-care management prior to discharge. Diabetes education can provide for an earlier discharge with improved outcomes in diabetes self-management post discharge and reduced hospital 30-day readmissions (Magee, Khan, Desale, & Nassar 2014).

Background/Significance

Hospital readmissions contribute to increased health care costs and suggest a lower quality of care. Overall, 25% of hospitalized patients have diabetes, which could be a contributing reason for readmissions (Drincic, Pfeffer, Luo & Goldner, 2017). Readmission is defined by the Centers for Medicare and Medicaid Services (CMS) as a hospital admission within 30 days of discharge from any hospital facility (“CMS”, 2016). Hospitals have been charged with improving their delivery of care, implementing strategies to reduce hospital readmissions and identifying risk factors that contribute to readmissions (Drincic et al., 2017).

A study by Sonmez et al. (2017) examined the readmission rates in patients with diabetes versus those without diabetes. The study was a retrospective cohort study that examined the 30-day readmission rates of 102,694 diabetes and non-diabetes patients and found that patients with diabetes had higher readmission rates (15.3% versus 8.4%). Drinic et al. (2017) found diabetes to be an independent risk factor for 30-day readmission. To reduce readmission rates in patients with diabetes, close follow up, education and management was necessary prior to discharge. Ninety percent of all patients with diabetes have type 2 diabetes (Sullivan & Alexander, 2019). Sullivan and Alexander (2019) found that health coaching for patients with type 2 diabetes mellitus on diabetes self-management decreased 30-day readmissions. Diabetes has become a prevalent condition among hospitalized patients. Of the hospitalized patients who have diabetes, 50% to 80% lack knowledge about diabetes, which includes an understanding of an ideal hemoglobin A1C and basic diabetes education.

Therefore, it is important to target these at-risk individuals and implement strategies such as diabetes education delivered by nurses that would influence readmission rates in patients with diabetes. However, bedside nurses may not have the knowledge or have the clinical time to educate patients on diabetes. They may not have received proper training, nor enough time to provide education as it takes approximately 45 minutes to one hour to provide diabetes education adequately. Diabetes educators, once employed at the local organization, were eliminated three years ago due to hospital budget cuts. The nursing staff then had to face the challenge of ensuring that the patients received proper diabetes education prior to discharge. Unfortunately, diabetes patients are frequently discharged with inadequate education, which increases their risk for hospital readmission.

Case managers have identified patients with diabetes who have not received sufficient education during discharge planning. Although not trained to provide education for patients with diabetes, case managers are expected to provide this education. As case managers, the need for diabetes education can be amplified when patients with diabetes request information about their diabetes, as well as requests regarding obtaining supplies and follow up. Alharbi, Thomacos and McLelland (2019) found that those providing effective diabetes education needed to be competent in diabetes self-management education.

To reduce risk of hospital readmission, diabetes self-management education (DSME) has been highly recommended. Diabetes self-management involves education on healthy diet, exercise, self-monitoring of blood glucose, avoidance of risk factors and complications (Chai et al., 2018). Similarly, the American Association of Diabetes Educators (AADE) agrees that DSME is an important part of diabetes management and establishing best practices. The AADE acknowledges that diabetes education is needed to bridge the discharge from the inpatient hospital to the outpatient setting and be centered on AADE self-care behaviors in an effort to decrease hospital costs related to readmissions.

Hospitalization provides an ideal time to identify barriers to improving the diabetes home regimen and promote DSME (Inpatient Diabetes Management, 2016). Nevertheless, despite the many different DSME programs available, there is still a lack of diabetes education knowledge (Chai et al., 2018). Currently, DSME is underutilized, which may be the reason patients experience a knowledge gap about diabetes (Beck et al., 2017). Patients are discharged home to self-manage their diabetes, so education prior to hospital discharge is essential.

Problem Statement

Readmission rates are a national priority that impact hospital reimbursement and cause hospitals to lose money. A clinical problem in the acute care setting was the readmission rate within 30 days of discharge of adult patients diagnosed with diabetes. Readmission rates are affected by patient outcomes regarding diabetes self-management. Readmission rates have an impact on hospital reimbursement. Assessment of the local organization's readmission rate revealed that there was a problem in the acute care setting. Readmissions within 30 days of discharge in patients with diabetes continued to occur and influenced patient outcomes.

An assessment was completed of the organization's readmission rate with data tracked from January 2018 to April 2018 and revealed that the 30-day readmission rate for patients on diabetes agents was 20.5%. This reflected that one in five patients who took diabetes medication agents were readmitted. The local organization currently does not track patients with diabetes by the admitting diagnosis code. This DNP project explored whether diabetes education reduced 30-day readmissions to the hospital.

Purpose Statement

The goal of this quality improvement project was to implement an evidence-based diabetes education program for adults diagnosed with diabetes and reduce hospital readmissions within 30 days. The quality improvement project compared the percentage of readmissions after implementation to determine if the patients who received diabetes education prior to discharge had a reduced percentage of readmissions as compared to the 20.5% first quarter readmission rate in 2018. A second goal was to evaluate if there was a difference between the pre-intervention and post-intervention self-care knowledge questionnaire after evidence-based diabetes education. The current evidence supported that there were educational processes and

similar educational methods being utilized by various hospitals to reduce hospital readmissions but there was no standardized teaching approach (Alharbri, Thomacos, & Mclelland, 2019; Baggio et al., 2013; Beck et al., 2017; Chai et al., 2018; De Carvalho Torres et al., 2014; Drincic et al., 2017; Dungan et al., 2014; Funk et al., 2017; Healy et al., 2013; Howe et al., 2017; Jalilian et al., 2014; Kangovi et al., 2014; Kaya and Karaca, 2018; Magee et al., 2014; Morella et al., 2016; Peek et al., 2014; Prochnow et al., 2018; Raghavan et al., 2014; Shawley-Brzoska & Misra, 2018; Silveira et al., 2018; Sullivan & Alexander, 2019; Ugur et al., 2015; Yacoub et al., 2015; Zibaenezhad et al., 2015).

Literature Review

The following PICOT question was utilized to guide the search for literature to review, “In adult patients admitted with diabetes, does diabetes education improve self-care behavior and reduce readmissions to the hospital within 30 days?”

Search process

A search process was initiated to search, identify and record pertinent peer-reviewed articles that contributed to answering the question. Several databases from the Jacksonville University Swisher Library were used: Cumulative Index to Nursing and Allied Health Literature (CINAHL); PubMed; ProQuest; and Elsevier Science Direct. Additionally, Google Scholar was utilized to retrieve scholarly articles. The key terms used in the search for articles were *diabetes team, diabetes discharge planning, diabetes educator, inpatient diabetes specialist nursing, nurse discharge advocate, diabetes and readmissions, diabetes and 30-day readmissions, diabetes interventions to reduce readmissions, diabetes education programs, diabetes self-management education, diabetes self-management behaviors, teach-back and diabetes and health literacy self-care behavior, adult patients, inpatient, diabetes and diabetes self-care*

questionnaires. The limiters utilized were full text, dates from 2000 to present year, English, peer-reviewed and research articles. Exclusion criteria included articles published before 2000, persons less than the age of 18, and non-residents in long-term facilities. During the search process, a total of 89 articles were retrieved and reviewed, but only 42 met the inclusion/exclusion criteria. The search process dated back to the year 2000 because the Summary of Diabetes Self-Care questionnaire by Toobert was written at that time. The search process revealed 42 articles that contributed to the literature review supporting that diabetes education for inpatients prior to discharge reduces hospital readmission within 30 days.

Purpose of the literature review

The purpose of this literature review was to evaluate the literature regarding the impact of diabetes mellitus (DM) discharge education among adult in-patients diagnosed with diabetes who had reduced hospital readmissions within 30 days. Diabetes agents are used by individuals diagnosed with diabetes to control their blood glucose levels and maintain metabolic control (Marín-Peñalver, Martín-Timón, Sevillano-Collantes, & Del Cañizo-Gómez, 2016). The objective of the review was to evaluate if diabetes education decreased readmissions within 30 days, as well as improve self-management (healthy eating, being active, glucose monitoring, daily foot checks) of diabetes. The literature review examined whether diabetes education or interventions provided prior to discharge had an impact on reducing readmissions of adult patients diagnosed with diabetes. The literature review also searched for similarities among various hospitals and facilities to explore the use of diabetes educational interventions or programs that may be used.

Certified and trained diabetes educators

A common theme identified throughout the review of literature was the use of certified or trained diabetes educators to provide diabetes education prior to discharge from the hospital to reduce hospital readmissions within 30 days. The American Association of Diabetes Educators (AADE) recommends that all interdisciplinary teams should include a diabetes educator to educate patients with diabetes or hyperglycemia. Diabetes educators are trained healthcare professionals who have undergone appropriate diabetes self-management training and credentialing consistent with the profession's scope of practice. It is not uncommon for registered nurses (RNs) to obtain certification in diabetes education but being a RN is not a requirement for the certification. Diabetes education should begin on admission, along with discharge planning, continue through the hospital stay, and be followed up on and after discharge (American Association of Diabetes Educators, 2019).

The target is to prepare the patient or caregiver to perform self-management skills by discharge. Inpatient diabetes education focuses on basic skills and knowledge to serve as a bridge for outpatient patient education and care. Education includes nutrition therapy, thus there is value in a dietician consult and medication management. During hospitalization, a diabetes educator can best identify gaps in diabetes education and promote diabetes self-management (AADE, 2019; Funk, Klinkner, Kocurek, Manchester & Noskowiak, 2017). Even though diabetes educators are not called care coordinators, they take on this role for patients. They ensure patients have what is necessary to remain home and self-manage their disease and have follow-up appointments and instructions after discharge (Donihi, 2017).

The National Practice Survey of AADE in 2015 stated that 15% of diabetes educators work in inpatient settings. Diabetes educators are part of the interdisciplinary team and

participate in preparing individualized discharge plans that pertain to diabetes. With so many diabetes educators in the hospital arena, it is the position of the AADE to ensure that they are implementing practices that facilitate diabetes self-management skills prior to discharge and teaching patients or caregivers those skills. Furthermore, it is recommended that the basic survival skills revolve around seven health care behaviors in AADE7 self-care behaviors with a focus on diet, exercise, self-monitoring of blood glucose, knowledge of risk factors and prevention of complications. Upon discharge, patients should receive referrals to diabetes educators for DSME follow up (Inpatient Diabetes Management, 2016).

Diabetes educators have an important role in the lives of those living with diabetes, therefore, they need to be competent in providing diabetes education. Alharbi, Thomacos and McLelland (2019) evaluated core competencies for diabetes educators since they are responsible for educating individuals living with diabetes. They found that DSME was performed more than any other program to influence individuals with diabetes to adapt healthier behaviors and adhere to their diabetes medication agents. DSME provided by competent educators showed reduced patient hemoglobin A1C, assistance with weight loss, and reduced hospital readmissions for diabetes related issues.

Diabetes educators to provide diabetes education prior to hospital discharge

In a study conducted by Dungan et al. (2014), the researchers implemented certified diabetes educators (CDE) that performed basic diabetes survival skills prior to discharge. This was considered an inpatient diabetes education program and discharge support. The educational program occurred after patients received orders for a diabetes education consultation. The survival skills implemented were glucose examining, medication preparation, recognition of hypoglycemic and hyperglycemic signs and basic diabetes meal preparation (Dungan et al.,

2014; Healy, Black, Harris, Lorenz, & Dungan, 2013). They were also taught how to create individual meal plans and count carbohydrates. At discharge, the CDEs provided assistance with medication reconciliation and assessed barriers to follow-up care. Phone calls were made one week following discharge by the CDEs to answer any questions and offer assistance. The study suggested that patients who received inpatient diabetes education prior to discharge had a significant decrease in their HbA1C at their follow-up appointments (Dungan et al., 2014).

Furthermore, a similar study evaluated diabetes education was implemented by qualified diabetes educators during the hospitalization of patients with poorly controlled diabetes. The findings were significant for reduced readmissions by 34 percent by the 30-day mark and 20 percent by the 180-day mark (Healy et al., 2013). In this diabetes education study, there were 2,265 patients enrolled in the 30-day analysis and 2,069 patients in the 180-day analysis, with only 319 patients readmitted from both groups within 30 days. The study was a retrospective study that identified patients from a single hospital through the computer system. The system looked at discharges with a diagnosis of diabetes in each of the two groups respectively and followed them for readmission. Similar to the previous study mentioned by Dungan et al., patients received diabetes education while in inpatient status by certified diabetes educators. In this diabetes education, patients received basic diabetes survival skills which included blood glucose monitoring, treatment management, identification of hypoglycemic and hyperglycemic signs and meal preparations (Healy et al., 2013; Dungan et al., 2014). The study findings demonstrated a significant reduction in readmissions, with improved patient outcomes, reduced health care costs and improved quality of care, as well as patient satisfactions from implementing a certified diabetes educator (Healy et al., 2013).

The competency of a diabetes educator aligns with the progress in diabetes self-management skills of the patient (Alharbi, Thomacos, & Mclelland, 2019). The use of inpatient diabetes educators to educate patients on basic diabetes survival skills can impact 30-day readmissions to the hospital, improve patient outcomes and satisfaction (Dungan et al., 2014; Healy et al., 2013). This study revealed the practicability of providing an inpatient knowledge-based diabetes “survival skills” education program at the bedside based on pretest results. The education was provided by licensed practical nurses and baccalaureate degree nurses, thus implying that competent educators are best for providing diabetes education.

The role of diabetes education expanded

Another project uniquely expanded the role of the certified diabetes educator and added on case management discharge planning calling them Diabetic Resource Nurses (DRNs) (Drincic, et al., 2017). The authors hypothesized that DRNs would be a resource to other units and patients to improve patient care and reduce readmissions. The DRN Model of Care was developed and implemented in the project. The DRNs new responsibilities under the DRN model included patient education and interaction, discharge planning, assessment for barriers to discharge, patient follow-up throughout the hospital stay, and a focus daily on patient interactions and interdisciplinary team collaborations to improve diabetes management. Additionally, the incorporation of case management enhanced the DRNs’ skills by being able to identify patients at risk for readmission, coordinate education of diabetes self-management skills and ensure patients were able to receive supplies and follow-up care needed for a safe and appropriate discharge (Drincic et al., 2017).

The DRN study resulted in a meaningful decrease in 30-day readmissions as readmissions were reduced by 17.6% in the group of patients with diabetes who received DRN

care compared to patients who received the traditional diabetes management education. Based on these results, the hospital implemented the DRN model throughout their 600-bed facility.

Therefore, their study question was answered, and the rate of readmission decreased among patients that received the DRN implementation (Drincic et al., 2017).

Furthermore, a study conducted by Kangovi et al. (2014), created an IMPACT model and piloted a randomized clinical trial which implemented tailored community health workers (CHWs) as an intervention to improve post-hospital outcomes of patients with diabetes and reduce 30-day readmissions among low socioeconomic status patients. In this study, CHWs were diabetes trained individuals that shared similar socioeconomic experiences with their patients, thus enabling them to facilitate support and education to their patients. Additionally, CHWs were disease specific trained and therefore focused on the diseases of which they received preparation. During the study, patients were assigned to CHWs who worked with them to create individualized patient plans and goals and provided support two weeks following discharge. The study demonstrated that a brief intervention during the hospital stay and a two week follow up performed by CHWs impacted and improved follow-up care and access after discharge, discharge interventions, improved patient participation and decreased 30-day readmissions. The study suggested that these findings can help health care systems improve patient experiences, health outcomes and cost, reduce readmissions and offered a strategy for patient-centered care by hiring CHWs (Kangovi et al., 2014).

Lastly, a study performed looked to measure diabetes consultant care available seven days a week. The study assessed discharge pattern rates, length of stay, and 30-day readmissions following implementation (Raghavan, Baskar, Buch, Singh, & Viswanath, 2014). The study introduced a seven-day consulting working system where diabetes consultations was available,

which included Saturday and Sunday rounding. Data was collected for seven months and performed at a large busy hospital. The results were surprising as the length of stay remained the same, but the 30-day readmission rates dropped from 132 to 107, which was interpreted into a 625-possible bed stay decrease over the course of the study. The most substantial impact noted was over the weekend, suggesting that a seven-day diabetes consulting service can improve patient throughput (Raghavan et al., 2014). Through the noted studies, it can be deduced that the use of trained competent diabetes educators can impact hospital readmissions, patient outcomes, satisfaction and decrease hospital costs.

Diabetes educational programs

Diabetes educational programs were discussed in several research articles. Beck et al. (2017) noted that The National Standards performed a study and found that DSME supports current evidence-based practice and should be used in different settings to educate and promote diabetes education. These standards are recognized and used by AADE and should serve as a guide in healthcare. The diabetes self-management education can also be used with individuals diagnosed with prediabetes as they need to have lifestyle changes to delay the onset of type 2 diabetes. The National Standards also recognized that DSME decreases hospitalizations, which means it indirectly reduces hospital readmissions and improves patients' outcomes. Diabetes education is fundamentally important to a person with diabetes, but the type of education matters also. Thus, DSME should be strongly considered as it has demonstrated strategies to improve self-care in diabetes (Beck et al., 2017).

A pilot program launched, "Everyone with Diabetes Counts Program" by Silveira et al. (2018) focused on individuals in rural areas living with diabetes. Participants were enrolled in classes from February 1, 2013 to June 30, 2014 to receive DSME. The program objectives were

to lessen inequalities and improve diabetes education health outcomes through DSME. Patients diagnosed with diabetes who did not complete the DSME education had more hospitalizations compared to those who completed the DSME education. The program outcomes supported that providing DSME prevents hospitalizations and saves health care dollars among individuals living in rural areas. Diabetes self-management education can be taught to individuals in different settings, including those in rural distant areas.

Furthermore, Zibaenezhad et al. (2015) stressed that diabetes educational programs are key to increasing patients' knowledge of their condition and empowering them to self-management. In a quasi-experimental six-month trial, with a pretest/posttest design conducted on 100 adult patients with type 2 diabetes, patients with diabetes felt empowered to manage their diabetes after education. To complete the study, all 100 patients participated and completed three diabetes education sessions. They followed up three months later for a glycohemoglobin check. The influence of educational interventions in improving glycohemoglobin levels by providing educational classes was assessed. The educational intervention included diabetes education, exercise training and nutritional education to increase patient awareness and understanding on diabetes management. The authors viewed diabetes education as key to controlling blood sugars and increasing patient knowledge, self-management skills, psychosocial behaviors and coping skills. Therefore, the authors were not surprised to learn that the participants' three-month follow-up appointment had a significant drop in their glycohemoglobin level, thus diabetes programs were greatly supported (Zibaenezhad et al., 2015).

To build upon the previous study noted, Sullivan and Alexander (2019) developed a pilot program and examined if health coaching in type 2 diabetes increased self-management skills and reduced 30-day hospital readmissions. The program took place in a 273-bed acute care

hospital with the goal in mind to equip patients with diabetes self-management skills, confidence and reduce 30-day hospital readmissions. As the majority of patients were going home to manage their diabetes, the need for diabetes self-management education was amplified. The program referred to the diabetes education as “health coaching”. Health coaching involved diabetes self-management skills and repeated reminders to increase medication adherence. In this study, case managers were utilized to implement the behavioral teaching as they are involved in the discharge process and well positioned to introduce diabetes education. Case managers follow hospital readmissions and chronic illnesses, and therefore hospitals could benefit from their skills to help reduce the number of readmissions. The program was successful and supported that health coaching or patient education that involved self-management can empower patients to modify lifestyle habits and reduce 30-day hospital readmissions (Sullivan & Alexander, 2019).

In a quantitative descriptive study conducted over 12-months by Baggio, Santos, Sales, and Marcon (2013), the perceptions of people with type 2 diabetes for readmissions was analyzed. The study was conducted by interviewing seven selected participants. The data were transcribed, and themes generated. The themes reflected that participants had limited diabetes knowledge, thus contributing to hospital readmissions and that it is necessary to promote lifestyle changes by healthy practices such as reading labels, exercise, glucose and blood pressure control and investing in diabetes educational programs that promote self-care. The study results supported the need for diabetes educational programs to promote wellness (Baggio et al., 2013).

Diabetes self-management education can positively influence psychological status

Diabetes self-management education can help patients learn how to manage their diabetes including improvement of blood glucose levels, as well as positively influence the psychological

status of those newly diagnosed with diabetes (Chai et al., 2018). This is important as newly diagnosed patients in the hospital setting may be in disbelief and block out diabetes education. A study was conducted to evaluate the psychological outcomes and glycemic control in newly diagnosed patients with type 2 diabetes after receiving a diabetes self-management education program. Two groups were randomly assigned from 118 patients in a hospital in Dandong. One group received the diabetes self-management education, and the other group was the control group. Only patients that were newly diagnosed with type 2 diabetes took part in the study. The patients in the education group received diabetes self-management education that included exercise, healthy eating, blood glucose monitoring, and understanding and prevention of complications. The control group did not receive diabetes education prior to discharge from the hospital. Instead, the control group received the education after hospital discharge during the outpatient visit, which was the norm. The study results supported that diabetes education is crucial for patients with diabetes, but especially for those recently diagnosed patients who are more prone to anxiety, mood swings, and depression, all of which can affect glucose levels in the blood. Furthermore, the results reflected that diabetes self-management education was successful in improving mood, anxiety and depression and promoting better glycemic control (Chai et al., 2018).

A community-based diabetes prevention and management program examined the participants' perceptions of educational programs. The diabetes program modeled the National Diabetes Prevention Program and AADE7 Selfcare Behaviors. The participants completed a survey that assessed the benefits and barriers of diabetes education. Seventy percent viewed the AADE7 education program as encouraging and helpful. Also, 65% stated that the diabetes educational program helped them make positive lifestyle changes. The framework of the AADE7

education program supports the benefit of this program for patients with diabetes in the community program (Shawley-Brzoska & Misra, 2018).

Diabetes education to improve diabetes-self-management skills

A study conducted by Magee, Khan, Desale & Nassar (2014) was performed in a teaching hospital. One hundred and twenty-five adults with uncontrolled diabetes, or glucose levels greater than 200 or less than 40 on admission, were provided with survival skills education. Changes in core diabetes knowledge were measured. A Diabetes to Go Knowledge Survey was used pre and post-delivery of education. The survey consisted of 11 questions with eight core knowledge and three questions regarding diabetes medications. Education was provided via a video “Diabetes to Go”. Handouts and a copy of the video was given to each participant to take home. The educational content was aligned with the American Diabetes Association and Joint Commissions. The educational survival skills consisted of defining diabetes, prevention, recognition, and treatment of hypoglycemia and hyperglycemia, when to seek medical help, timing of diabetes medications, how to perform self-blood glucose monitoring, blood glucose targets, dietician importance, and how to manage sick days. There was a significant improvement from the pre to post Diabetes Knowledge Survey. Sixty-one percent correctly responded to five pretest questions and 89% in the post test. Additionally, the emergency room and hospital admissions showed an improved trend from three months (14%) before implementation and three months (5%) after, suggesting that diabetes education does decrease hospital readmissions (Magee et al., 2014).

“Improving Diabetes Care and Outcomes on the South Side of Chicago” was a project that was implemented in communities in the south side of Chicago and focused on the African American working minorities (Peek et al., 2014). Ethnic subgroups face impediments to diabetes

healthy nutrition, places to exercise, diabetes education and self-care supplies. The diabetes classes supported behavioral change by patient workshops, instructions for diet and training, healthy food spending visits, nourishment storerooms, guidance in healthy diet preparations, exercise programs and workshops to know how to ask questions of the medical provider.

Interestingly, the diabetes classes incorporated role playing to master success in reading labels, ordering restaurant food, finding exercise places and asking physician questions. The project was such a success and it continues to be used to reach this minority group today (Peek et al., 2014).

Likewise, another study conducted to evaluate self-management promotional diabetes educational programs was performed on patients with diabetes who live in Iran, and also faced barriers to gain access to diabetes information, education on healthy lifestyle choices and access to resources (Jalilian et al., 2014). The authors believed that diabetes can be controlled by creating diabetes risk and symptom awareness, counselling on diet, exercise, blood sugar control and medication administration. The study lasted for two months and was implemented in four health care centers in Iran on patients with type 2 diabetes. There was a total of 120 participants, 60 were in the intervention group and 60 in the control group. The diabetes educational courses consisted of six weekly teaching sessions including lecture and discussion. The study outcomes supported a diabetes self-care implementation educational program. A noteworthy study weakness was that patients had low education, and thus an additional two hours was spent with families providing training and education (Jalilian et al., 2014).

Diabetes education conducted differently

De Carvalho Torres, dos Santos and de Souza Cordeiro (2014) conducted a qualitative study to determine if home appointments such as a health education program to educate patients with type 2 diabetes and their self-care practice was beneficial. The study was performed in four

basic health care units in Brazil using diabetes training programs. Twenty-five home visits occurred, and data were collected during the visit. Four themes emerged: feelings, which were fear, anger and need for acceptance of diabetes diagnosis; knowledge, which included need of health care workers to be more knowledgeable and provide education regarding diabetes; meal planning and activity adherence, which referred to knowledge; and barriers, which were lack of time to perform self-care needs and activities. It was concluded that strategies were needed to overcome the barriers discovered during home visits and that knowledge about diabetes was key to achieve accurate self-care practices. Home health care is not a new concept that has been utilized to educate patients about diabetes and self-care techniques, and has been shown to assist in reducing hospital readmissions by managing many diabetes health issues that arise in the home (De Carvalho Torres et al., 2014).

Moreover, a study that developed a “Telephonic Complex Care Program” was implemented to evaluate if telephone calls providing health coaching, education, diabetes follow-up and support would reduce readmissions (Morella et al., 2016). The study evaluated the effectiveness of a telephone-based education program in elderly members of a private insurance. The research was a case-controlled pretest and posttest study design, performed over a 12-month period. A follow-up phone call was made after the patient was discharged from the hospital and had two admissions within 12-months. Diabetes education was included in the post discharge phone calls. The telephone program did not have a reduction in readmissions and in care utilizations and costs, thus suggesting that face to face diabetes educational programs can be more beneficial (Morello, et al., 2016). Diabetes educational programs and diabetes self-management skills and behaviors are an important aspect of diabetes survival as they are key to

increasing diabetes knowledge, controlling blood sugar, mastering self-management skills and maintaining a healthier lifestyle. This may decrease 30-day hospital readmissions.

Teach-back method

Funk et al. (2017) noted that among hospitalized adult patients, diabetes mellitus is the second most common discharge diagnosis. Therefore, it is important to reach diabetes patients prior to discharge. Many patients with diabetes are hospitalized for other co-morbid conditions, therefore these patients are missed and not flagged for diabetes education. An identified critical time to provide diabetes education is when transition of care occurs during and before hospital discharge. Inpatient diabetes education focuses on basic skills and knowledge to serve as a bridge for outpatient patient education and care. Diabetes educators were found to use the teach back method more than any other method to educate their patients. A study titled, “Use of Recommended Communication Techniques by Diabetic Educators” by Howe, Walker and Watts (2017) was conducted to understand diabetes educators’ perceived effectiveness of communication techniques to educate diabetes patients. Diabetes educators were faced with the challenge of educating patients with diabetes and confirming that they understand the education. In this descriptive correlational study, a convenience sample of 522 diabetes educators completed the AMA Communication Survey. The study results confirmed that 93% used simple language, 81% hand out printed material, and 76% used the teach-back method. The follow-up phone calls were at 43%. Simple language print outs and teach-back were the most utilized teaching methods used by diabetes educators in the study (Howe, Walker & Watts 2017).

Prochnow, Meiers and Scheckel (2018) implemented a project to improve patient outcomes through tailored evidence-based practice education using the teach-back method and the Ottawa Model of Research. The study utilized a prospective approach with a one-group pre

and post education design including registered nurses, patients and caregivers. The study proposed that patients have the right to receive education regarding their discharge in a way they understand, which includes their level of health literacy. The registered nurses reported inadequate knowledge in the teach-back method. After the implementation of the study, the Hospital Consumer Assessment of Healthcare Providers and Systems scores went from 6% to 10% in the specific area of education on new medication. This study also added that it performed a systematic review on health literacy sensitivity and found that plain language, teaching three to five key points and the teach-back method were best used to ensure comprehension of the diabetes education performed. The teach-back is not new to the teaching arena, but nurses need to be educated on how to apply it. This strategy can strengthen safe nursing practice and improve patient medication understanding (Prochnow, Meiers & Scheckel 2018).

Health literacy to promote diabetes self-care behaviors

According to Lee, Song and Im (2017), health literacy is an important topic in diabetes education because if patients do not understand what is being taught, then they will not follow through with the education received. Additionally, it is important because it can help with better understanding of the health condition and improve overall health. Health literacy means to have cognitive and social skills that help one understand and use information to maintain good health. A randomized, controlled trial in south Korea evaluated a health literacy diabetes self-management program. The intervention group completed the health literacy program and the control group received usual care. There were 51 patients who completed the 12 weekly sessions on health literacy diabetes self-management. There was a significant post-test difference in all aspects. The results concluded that health literacy can help determine one's health status, assist with decision making and improve participation in diabetes self-management programs. Also,

such a program could improve individuals' diabetes self-care knowledge, health beliefs, self-efficacy and behavior.

In the study previously mentioned by Prochnow, Meiers and Scheckel (2018), the importance of health literacy was acknowledged. The researchers concluded that patients have the right to receive education regarding their discharge at their health literacy level. In a similar study by Howe, Walker and Watts (2017), the researchers emphasized that one of the reasons for their study was due to a systematic review of health literacy sensitive diabetes education. The study stressed the importance of using plain language, teaching three to five vital points or using the teach-back method to make sure diabetes education was understood. The researchers wanted to compare these results to what the perceptions of diabetes educators were. It was found that the educators who had received health literacy training reported that they used a higher number of education techniques than those who did not. Thus, these findings emphasized the point that those with health literacy training understood the importance of using additional communication techniques. The study conclusions recommended that health literacy and communication skills should be incorporated in competencies. The results suggested that health literacy advocates may have introduced the teach-back method into the diabetes educators' practice (Howe, Walker & Watts 2017).

A major study outcome found that a link existed between diabetes and low health literacy (Davis, 2018). This study was distinctive because a cross sectional analysis from the Health Aging and Body Composition study was performed, which was a 20-year longitudinal cohort study of 2,500 culturally diverse adults. The national survey found that 71% of older adults had basic or below basic diabetes skills such as taking medications correctly, calculating portions, checking blood sugar correctly and conducting foot inspections. The CDC selected three health

literacy plans to reach their “Healthy People 2020 national health objectives” including to provide instructions in a manner that can be easily understood, using the teach-back method to confirm knowledge of how they will follow instructions at home and to offer assistance to complete forms (Davis, 2018).

Health promoting behaviors are key to managing diabetes and improving patients’ quality of life. The correlational study performed by Chahardah-Cherik, Gheibizadeh, Jahani and Cheraghian (2018), evaluated the relationship between health literacy and health promoting behaviors in patients with type 2 diabetes. It focused on type 2 diabetes because this makes up 90% of the diabetes population. The study was performed on 175 eligible patients with diabetes who were chosen using convenience non-probable sampling. Questionnaires were answered on diabetes health promoting behaviors and health literacy. The research findings provided evidence that a positive link exists between health literacy and health promoting behaviors. The higher the health literacy level, the more likely health promoting behaviors were adapted. It is important to note that health literacy needs to be acknowledged as a factor that promotes healthy behaviors, thus improving the quality of life (Chahardah-Cherik et al., 2018).

Increasing nurses diabetes knowledge

Nurses come in contact with hospitalized patients with diabetes through the care provided during the shift and especially at discharge. The literature indicates that facilities can prepare nurses with the necessary diabetes knowledge so that it can be passed on to their patients. This can impact hospital readmissions, costs, resources, patient outcomes and satisfaction. A hospital in Jordanian identified that nurses had inadequate diabetes knowledge, which was a barrier to teaching patients with diabetes appropriate self-management skills, thus impacting readmissions. A quasi-experimental pre-test/post-test design using one group was implemented (Yacoub et al.,

2015). Participants were from an accessible sample from three health care facilities and 129 registered nurses recruited. The education provided was a one-day lecture via a PowerPoint presentation. Pre-test scores were 52.7% and post-test scores were 78.3%, which reflected a marked improvement in their diabetes knowledge. The study suggested that facilities can use this strategy to improve nurses' knowledge, provide continuing education credits and reduce hospital readmissions (Yacoub et al., 2015).

According to Ugur, Demir and Akbal (2015), a new diabetes diagnosis can be received while in the hospital being treated for another condition. Therefore, all nurses should be familiar with the basic care of diabetes. However, most nurses do not have sufficient knowledge of diabetes, nor do they have trust in their ability to educate patients about their diabetes. New postgraduate nurses also needed to be educated about diabetes. A descriptive study conducted in a university hospital by Ugur, Demir and Akbal (2015) identified nurses' approach to diabetes care and their diabetes educational needs to develop the diabetes education program, Basic Diabetes Patient Care Education Program. A survey of 87 bedside nurses who were taking care of patients with diabetes was completed. A data collection tool with close-ended and open-ended questions was utilized. It was found that two thirds of the nurses were teaching insulin injections during discharge and 39% reported inadequate knowledge. Additionally, it was revealed that these nurses did not have general diabetes nursing care skills and were not familiar with diabetes agents and nutritional importance. Graduating from nursing school does not mean nurses are provided with sufficient knowledge regarding nutrition, medication, insulin needs and skills to educate patients with diabetes. It is important to note that nurses have primary access to patients and their method of education has a great influence on patients' success of their diabetes care post discharge (Ugur, Demir & Akbal, 2015).

Another study was conducted to evaluate nurses' level of diabetes foot inspection, which is an important topic in diabetes education. A frequent cause of diabetes admissions is diabetes foot problems, thus it is important to include this as part of the diabetes education nurses provide. Kaya and Karaca (2018) conducted a descriptive, cross-sectional study with the objective to evaluate the level of knowledge nurses possess regarding diabetes foot inspections and determine influencing dynamics. The participants, who were nurses, were asked to complete a questionnaire that evaluated their knowledge of diabetes foot inspection. The instruments used were the data collection tools, "Nurse Information Form" and "Nurses' Knowledge Level Form on Diabetic Foot Management". The results reflected that 66% did not receive education on diabetes foot inspection, 80.9% did not educate their patients on diabetes foot inspection, and 77.5% did not perform foot inspections on their patients with diabetes. The study results revealed that nurses had adequate diabetes foot inspection knowledge but were not being taught how to educate their patients. Therefore, training programs were needed to educate nurses on how to incorporate diabetes foot inspection in their practice (Kaya and Karaca, 2018).

Furthermore, in the study by De Carvalho Torres (2014), one of the themes that emerged was the need for health care workers to provide education and knowledge to their patients regarding diabetes, meal planning, activity involvement, and self-care needs. Strategies need to be implemented to improve nurses' knowledge about diabetes as they are involved in everyday patient care and discharges from the hospital setting, thus they can assist to reduce diabetes hospital readmissions. Because the number of diabetes admissions is expected to rise, it is important for nurses to have knowledge on recommended standards of care of patients with diabetes (Yacoub et al., 2015).

Health Belief Model

Nursing theories are important to nursing research as they provide direction for research. Additionally, they improve nursing processes and allow for critical thinking and have been found to improve patient care and communication. The Health Belief Model (HBM) (Appendix A) emerged as a category for this review of literature as it served as the structure for previous studies evaluating the education of patients on diabetes self-care and management (Peek, et al., 2014; Jalilian, et al., 2014; Subhi, Kendall, Al-Shafae, & Al-Adawi, 2016). The HBM suggests that if patients personally view their illness as a personal threat and believe that recommended health actions would improve their health outcome, then they would be more likely to adapt the behavior (LaMorte, 2018). Understanding of the HBM is theorized to help with understanding of why individuals adapt or reject diabetes education.

The HBM proposes six constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cue to action, and self-efficacy (Subhi et al., 2016). Perceived susceptibility refers to a person's perception of his or her vulnerability of acquiring a health problem. Perceived severity refers to the belief that the illness is severe enough to have serious consequences (LaMorte, 2018). For example, in an explorative qualitative study, "Health Beliefs of People with Type 2 Diabetes in Primary Health Care in Muscat, Oman: A Qualitative Approach", one on one interviews were conducted in seven conveniently selected primary care centers, and a total of 29 patients were invited. Many patients stated that they felt susceptible to medical problems due to diabetes and they viewed diabetes as a real threat to worsening their symptoms. Some felt that if their symptoms worsened, they would not be able to work due to the numerous hospital visits and other issues associated with the severity of the diabetes and with the inability to perform activities of daily living.

The threats were real to these individuals, thus they felt susceptible and perceived the severity of diabetes serious as this would interrupt other areas in their lives. There were a small percentage of participants who admitted to feeling susceptible to diabetes complications but did not perceive them as serious threats. The participants responded to phrases such as “God gave me the disease and he shall take care of me”, “No one in my family has any complications”, or “I take my medications”. This illustrates how perceived susceptibility and perceived threat go hand in hand. One must perceive the illness serious, in addition to believing they are vulnerable to complications to be motivated to change (Subhi et al., 2016).

Perceived benefits occur when an individual believes that certain treatments or medications will reduce symptoms or cure an illness, and thus looked upon as a benefit to self. Additionally, individuals need to view the benefits as outweighing the consequence of noncompliance or nonadherence to treatment. In a study that utilized the HBM as the framework to educate patients on self-management by educational programs, it was hypothesized that if patients were educated on understanding the benefits of self-management with their diabetes, then they would be more likely to believe in the benefits and perceive them as beneficial. This would promote adherence to the diabetes regimen. The authors incorporated the HBM in their study because they felt that if they focus on individual attitudes and beliefs, then they would be able to promote the diabetes education program and show a significant improvement in health outcomes (Jalilian et al., 2014). The perceived benefits must be viewed as beneficial to promote adherence.

The perceived barriers refer to impediments or obstacles that need to be overcome to adhere to the recommended treatment or regimen. These barriers can include cost, physical effects such as fear of pain, education that is time consuming or inconvenience. Inconvenience is

a perceived barrier as many individuals do not want to be disturbed in their routines or participate in treatments that require bothersome sacrifices such as driving, additional physician appointments, and programs that consume their time (LaMorte, 2018).

In a study conducted at selected primary care centers by Subhi et al. (2016), the HBM was applied and it concluded that the greatest perceived barrier to adhering to a type 2 diabetes regimen was cost. Many patients utilized their primary physicians for glucose testing as they did not have glucose meters and those that had one, only tested the blood sugar once a week due to the cost. Social interactions were also considered as a barrier as the patients' diabetes diet did not allow them to eat the foods they desired during social functions. Additionally, they felt that they were hurting the feelings of the hostess when they refrained from eating large amounts of food. The study took place in Oman, where food is most often used as a social event, thus it can be understood why social interactions were perceived as a barrier to the participants in the study, and this could be viewed as a study limiter. Therefore, perceived barriers need to be overcome to also promote behavior adherence.

The cues to action are the triggering motivation that promotes acceptance of the recommended health behavior. This could be the desire to feel better, fear of complications, or hospitalization threats or advice from others, family encouragement and reading articles and literature (LaMorte, 2016). In another study, the researchers utilized educational diabetes reading material and education to motivate individuals to self-manage their diabetes. The study applied the HBM to promote participation and adherence to the self-management diabetes programs. The cues to action were triggered by providing participants with literature and diabetes education to motivate them to accept the treatment (Jalilian et al., 2014). The motivators or cues to action can elicit acceptance of health behavior.

Self-efficacy was added to the model in the 1980s and it refers to an individual's self-confidence in the ability to adhere to the desired behavior. Persons need to believe in themselves in order to move forward and perform the recommended behavior. Lack of belief and assurance are detrimental to the success of performance (LaMorte, 2018). Self-efficacy can be viewed as a predictor of change. The HBM's theoretical concepts of perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy can be used to induce health behavior changes in individuals with diabetes, thus improve health outcomes (Peek et al., 2014).

Synthesis of Findings

The quality of evidence supported that diabetes education reduced hospital readmissions. The method of assessing level of evidence was to use the categories provided by level IIs (Healy et al., 2013; Kangovi et al., 2014; Lee et al., 2013; Morella et al., 2016); three level IIIs (Chahardah-Cherik et al. 2018; Subhi et at., 2015; Zibaenezhad et al., 2015); seven level IVs (Davis, 2018; Drincic et at., 2017; Howe et al., 2017; Jalilian et al., 2014; Magee et al., 2014; Sonmez et al., 2017; Yacoub et al., 2015); five level Vs (de Carvalho Torres et al., 2014; Dungan et al., 2014; Kaya & Karaca, 2018; Prochnow et al., 2018; Ugur et al., 2015); three level VIs (Baggio et al., 2013; Peek et al., 2014; Raghavan et al., 2014); and three scholarly articles (Donihi, 2017; Funk et al., 2017; LaMorte, 2018).

The review indicated that lack of diabetes education prior to hospital discharge increased the risk of 30-day readmissions (de Carvalho Torres et al., 2014; Drincic et al., 2017; Dungan et al., 2014; Healy et al., 2013; Kangovi et al., 2014; Magee et al., 2014; Raghavan et al., 2014; Sullivan & Alexander, 2019; Yacoub et al., 2015). Findings also indicated that education needs to include diabetes education taught by diabetes educated professionals to include diabetes self-

management education and behaviors, basic survival skills tailored to individual needs with appropriate health literacy and teach-back method (Alharbi, Thomacos, & McLelland, 2019; Baggio et al., 2013; Beck et al. 2017; Chai et al., 2018; de Carvalho Torres et al., 2014; Drincic et al., 2017; Dungan et al., 2014; Funk et al., 2017; Healy et al., 2013; Howe et al., 2017; Jalilian et al., 2014; Kangovi et al., 2014; Magee et al., 2014; Morella et al., 2016; Peek et al., 2014; Prochnow et al., 2018; Raghavan et al., 2014; Shawley-Brzoska & Misra, 2018; Silveira et al., 2018; Sullivan& Alexander, 2019; Zibaeenezhad et al., 2015).

The most common trend noted was that by providing diabetes education by certified and trained diabetes educators, hospital readmissions decrease, patient outcomes improve, and patient satisfaction improves. Patients are equipped with survival skills, and they are assessed for discharge barriers (Alharbi, Thomacos, & McLelland, 2019; Beck et al., 2017; Dungan et al. 2014; Drincic et al., 2017; Funk et al., 2017; Healy et al., 2013; Kangovi et al., 2014; Raghavan et al., 2014). The teach-back method was found to be the most utilized technique in diabetes education along with use of simple language, handouts and phone calls after discharge (Funk et al., 2017; Howe et al., 2017; Prochnow et al., 2018). Diabetes education programs were shown to be successful, as there was evidence to suggest that they increased patient knowledge and empowered patients to self-management. Moreover, studies suggested that diabetes education and DSME were key to increasing understanding, self-care skills, psychosocial behaviors and controlling blood sugars (Alharbi, Thomacos, & McLelland, 2019; Baggio et al., 2013; Beck et al., 2017; de Carvalho Torres et al., 2014; Funk et al., 2017; Jalilian et al., 2014; Magee et al., 2014; Morella et al., 2016; Peek et al., 2014; Shawley-Brzoska & Misra, 2018; Silveira et al., 2018; Sullivan& Alexander, 2019; Zibaeenezhad et al., 2015).

Behavior health changes were noted to be an important focus when the education programs were implemented as the researchers strived to encourage healthier lifestyle behaviors (Jalilian et al., 2014; LaMorte, 2018; Peek et al., 2014; Subhi et al., 2016). Diabetes education and materials were also provided at an eighth-grade level to improve health literacy. Health literacy was another important theme derived from the literature review. Improved health literacy can improve diabetes understanding and participation in care; therefore, the educator needs to incorporate this in the educational program (Chahardah-Cherik et al., 2018; Davis, 2018; Howe et al., 2017; Lee et al., 2017; Prochnow et al., 2018).

The synthesis of the literature suggested the importance of increasing nurses' diabetes knowledge as it was found to be a factor in reducing hospital readmissions (Yacoub et al., 2015; Ugur et al., 2015; Kaya and Karaca, 2018; Baggio et al., 2013; de Carvalho Torres et al., 2014). The review of literature suggested that nurses' diabetes knowledge needs to improve as they are involved in patients' medical care and patient discharges. If nurses participate in patient diabetes education throughout hospital stays and at discharge, then by improving nurses' diabetes knowledge, hospital readmissions by patients with diabetes may decrease.

The overall strengths of the literature review showed that the studies aimed to improve patient outcomes while reducing diabetes readmissions. The literature also recognized unplanned diabetes hospital readmissions as a significant contributor to increased health care costs and hospital readmissions, decreased reimbursement, quality of care, patient outcomes and satisfaction (Baggio et al., 2013; Drincic et al., 2017; Healy et al., 2013; Kangovi et al., 2014; Raghavan et al., 2014; Shawley-Brzoska & Misra, 2018; Silveira et al., 2018; Sonmez et al., 2017; Sullivan & Alexander, 2019). Furthermore, many of the diabetes educational programs were adjusted to fit the patients' level of education, which included diabetes education and

material to improve health literacy (Baggio et al., 2013; de Carvalho Torres et al., 2014; Funk et al., 2017; Jalilian et al., 2014; Magee et al., 2014; Morella et al., 2016; Peek et al., 2014; Zibaenezhad et al., 2015).

A general weakness noted during the review of literature was the lack of theory used to guide the research. Of all the articles reviewed, only seven used a theoretical framework. The HBM was the most frequently applied theoretical framework as it correlates to health actions. The HBM indicates that health actions represent how individuals view their illness and whether they take action to improve their lifestyle (Baggio et al., 2013). The synthesis of literature supported that diabetes education is an important aspect of improving patient diabetes knowledge, improving patient outcomes and satisfaction, lowering health care costs and reducing hospital readmissions within 30 days. Therefore, there is high quality of evidence to support that evidence-based practice diabetes education can reduce hospital readmissions.

Implications

Advanced nursing practice

Advanced nursing practice is impacted by diabetes readmissions as they are faced with stronger challenges to overcome the knowledge deficit that exists among patients with diabetes (Magee et al., 2014). Nurse practitioners (NPs) consult patients with diabetes in the primary care, nursing home, and acute care settings, thus they have the capability to influence their patients and subsequently have an impact on hospital readmissions. Diabetes education is central to diabetes management and NPs can impact their patient's diabetes knowledge by holding diabetes education classes and programs. Nurse practitioners are well positioned to offer diabetes education to their patients and those in the community.

Nursing education

Nursing education calls for higher expectations to increase the nurses' diabetes knowledge, whether in nursing school or practicing as a registered nurse, in an effort to improve patient care. Nurses need to be equipped with necessary knowledge to further pass on the knowledge to their patients. Nurses are well positioned to offer and provide diabetes teaching to their patients as they care for them throughout the day and at discharge. As evidenced in several studies that were discussed, nurse's diabetes knowledge needs to increase as diabetes admissions are expected to grow and nurses need to participate in the diabetes education provided to patients (Yacoub et al., 2015; Ugur et al., 2015; Kaya and Karaca, 2018; Baggio et al., 2013; de Carvalho Torres et al., 2014).

Nursing leadership

Nursing leadership is impacted by diabetes readmissions as nurses receive intense pressure from hospital organizations to lower readmission rates to avoid reduced reimbursement while improving patient outcomes and satisfaction (Boccuti & Casillas, 2017). Nursing leaders are well positioned to facilitate change in the hospital setting and advocate for patients to receive diabetes teaching prior to discharge and for nurses to have opportunities to enhance their diabetes knowledge by attending workshops. Nurse leaders could propose employing certified diabetes educators to provide diabetes education, assess diabetes discharge needs, assist with diabetes supplies and conduct follow-up appointments. The literature review provided evidence that diabetes educators have a significant impact on hospital readmissions (Dungan et al., 2014).

Health policy

Health policy is impacted by diabetes readmissions because health care reimbursement is affected. Medicare uses an "all-cause" term to define readmissions, meaning that regardless of the admitting diagnosis, hospital readmissions within 30-days of discharge are considered

readmissions. Medicare reduces monetary compensation to the hospitals with high readmission rates, thus there is pressure to reduce diabetes readmissions within the 30 days (Boccuti & Casillas, 2017). Advanced nursing practice, education, leadership and health policy are all impacted by diabetes readmissions and each are positioned to influence diabetes education that can reduce hospital readmissions of patients with diabetes.

Key Terms

Diabetes mellitus: insulin resistance or insulin deficiency characterized by a rise in blood glucose levels that can lead to complications (Chai et al., 2018).

Diabetes self-management education (DSME): education on healthy diet, exercise, self-monitoring of blood glucose, and avoidance of risk factors and complications (Chai et al, 2018).

Diabetes education is the process of providing knowledge, skills and ability to care for prediabetes and diabetes self-care and implementing behaviors to manage the condition (Beck et al., 2017).

Health Belief Model: a behavioral health theory. It proposes that if a person personally views his or her illness as a personal threat and believes that the recommended health action can improve the health outcome, then that person is more likely to adapt the behavior (LaMorte, 2018).

Perceived susceptibility: the person's perception of his or her vulnerability of acquiring a health problem (LaMorte, 2018).

Perceived severity: belief that the illness is severe enough to have serious consequences (LaMorte, 2018).

Perceived benefits: individual believes that certain treatments or medications will reduce symptoms (benefit to self) (LaMorte, 2018).

Perceived barriers: obstacles that need to be overcome to comply with treatment (LaMorte, 2018).

Cues to action: triggering motivations that promote acceptance of recommended health behavior (LaMorte, 2018).

Self-efficacy: an individual's self-confidence in the ability to adhere to the behavior (LaMorte, 2018).

Health literacy: the possession of cognitive and social skills that help one understand and use information to maintain good health (Lee, Song, & Im, 2017).

Conceptual Framework

Health Belief Model

Nursing theories provide conceptual frameworks that can be used as guides for nursing care and practice. Incorporating nursing theories in nursing practice can bring insight to new knowledge. The HBM was the main theoretical framework used in several of the studies reviewed about diabetes education (Jalilian, Motlagh, Solhl, & Gharibnavaz, 2014; Peek, Ferguson, Roberson, & Chin, 2014; Subhi, Kendall, Al-Shafae, & Al-Adawi, 2016). The HBM helps patients understand that if they personally view their illness as a personal threat and believe that the recommended health actions could improve their health outcome, then they are more likely to adapt the behavior (LaMorte, 2018). Understanding of the HBM helped reinforce why individuals better adapt or reject received diabetes education, and therefore it was selected as the conceptual framework for this DNP project.

The HBM proposes six constructs including perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (Subhi et al., 2016). Perceived susceptibility refers to a person's perception of his or her vulnerability of acquiring a

health problem. Perceived severity refers to the belief that the illness is severe enough to have serious consequences. In this project, the two concepts, perceived susceptibility and perceived severity referred to an individual's own belief of being susceptible to the complications of diabetes and that it must be viewed as a personal threat or perceived severe in order for a behavioral change to occur (LaMorte, 2018).

Perceived benefits occur when an individual believes that certain treatments or medications will reduce symptoms or cure an illness, thus looked upon as a benefit to self. Furthermore, benefits need to be viewed superior to the consequence of nonadherence to treatment. In this project, it was considered that the focus was on the attitudes and beliefs of the patient, which allowed the DNP lead to promote the diabetes education program and support an improvement in health outcomes (Jalilian et al., 2014). Perceived benefits were viewed as beneficial which promoted compliance.

Perceived barriers refer to hindrances that need to be overcome to adhere to the recommended treatment or regimen. In this project, barriers included cost, physical effects such as fear of pain, time consuming or inconvenience of diabetes education (LaMorte, 2018). Cost was anticipated to be the biggest barrier that needed to be overcome. Perceived barriers needed to be overcome to promote behavioral adherence.

Cues to action is what sparks the motivation and promotes acceptance of the recommended health behavior. This could be the desire to feel better, fear of complications, or hospitalization threats or advice from others, family encouragement and education from literature (LaMorte, 2016). In this project, diabetes education and reading material were utilized as cues to action that motivated individuals to self-manage their diabetes (Jalilian et al., 2014). Influences or cues to action can promote acceptance of the health component.

Self-efficacy was added to the model in the 1980's and it refers to an individual's self-confidence in his or her ability to adhere to the desired behavior. It also can help predict change. In this project, self-efficacy was encouraged as one needs to believe in themselves in order to move forward and perform the recommended diabetes education received (LaMorte, 2018). The HBM's theoretical concepts of perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy, were used as the theoretical framework to influence health behavior changes in patients with diabetes, and thus improve health outcomes (Peek et al., 2014).

Plan-Do-Study-Act Quality Improvement Model

The DNP project followed the quality improvement model, Plan-Do-Study-Act, which supported the idea of the implementation of inpatient self-management diabetes education at the local organization and whether it would result in an improvement in diabetes 30-day readmissions for patients on diabetic agents (Edupuganti, Bushman, Maditz, Kaminoulu, & Halalau, 2019).

Plan

During the *Plan* phase, the implementation and improvement goals were organized. The project was a rapid cycle with the implementation process that lasted three months. Prior to the implementation of the project, staff education occurred. Case managers were educated as they have access to readmission diagnosis. Their role was to identify patients who were admitted and on diabetes agents and had a diagnosis of diabetes. The participants were randomly selected from the list provided.

The intervention of the project occurred after approval from the Jacksonville University IRB. Patient selection occurred from the list created by case managers. The DNP lead met with

the selected patients and explained that they had been selected to participate in a quality improvement project in an effort to gain knowledge about diabetes education and improvement in hospital diabetes 30-day readmissions. Patients were provided with informed consent and information regarding the diabetes education project. Patients were given the opportunity to sign the informed consent or verbally opt out of the project. Patients were informed of the importance of the study to reduce hospital readmissions and improve patient outcomes in patients diagnosed with diabetes.

The DNP lead informed the patient of the project plan. After consents were signed, the DNP lead met with patients during their hospital stay to provide the pre-knowledge Summary of Diabetes Self-Care Activities (SDSCA) questionnaire and diabetes education. The retention of the diabetes education was evaluated at one week post lesson. Additionally, patients were followed 30 days after discharge for readmission by the electronic record. Diabetes education occurred for two months and 15 patients were identified and educated. The diabetes knowledge SDSCA questionnaire evaluated the patient's knowledge before and after the diabetes education program. Diabetes education was provided by the structured information handouts from the Association of Diabetes Care and Education Specialists on diabetes self-management. The diabetes sessions discussed the AADE7 handouts.

Do

During the *Do* phase, the plan was carried out. In this phase, the DNP lead met with the organization's leaders, stakeholders, manager, director and case managers. Case managers received the necessary education to identify patients on diabetes agents who could benefit from the diabetes education. The DNP lead carried out the implementation plan. The knowledge SDSCA questionnaire was given as a pre-intervention, then the diabetes self-management

education session occurred for 30 minutes. The post-intervention knowledge SDSCA questionnaire was re-administered seven days later. Patients who received the diabetes education were followed for 30 days post discharge for hospital readmission.

Study

During the *Study* phase, the new retrieved data were analyzed and compared against the baseline. In this project, the results from the pre-intervention and post-intervention from the knowledge SDSCA questionnaires were compared. Additionally, the readmission results from the patients who were followed for 30 days post discharge for readmission were compared to the organization baseline of 20.5%. Information was transferred from the data collection tool and verified as accurate. The Statistical Package for the Social Sciences (SPSS) was the statistical software package that was used to assist the DNP lead in answering the research question and perform the data analysis. The consulted statistician, Dr Peter Wludyka, also assisted with data analysis. To compare the means of pre-knowledge and post-knowledge of participants who obtained the intervention, the Wilcoxon Sign Rank test was utilized. The diabetes education group, and their responses to the intervention influenced the measurement of the dependent variable, a reduction in readmission in patients with diabetes within 30 days of discharge. The sample was compared to the current local organization readmission rate of patients with diabetes. The analysis determined that there was a significant difference post diabetes education between the quality improvement project readmission rate and the established local organization rate, which was 20.5%.

Act

During the *Act* phase, the quality improvement project was evaluated to determine if change needed to occur moving forward. The DNP project results were examined to determine

the project's sustainability and assessed if the diabetes education reduced hospital 30-day readmissions. The results of the project also determined if a change should be considered, further evaluated, and if additional implementation time was necessary. The collected information was presented to the organization so that it could be further utilized to enhance patient outcomes and the organization's structure for diabetes education. The results of this project had practical implications for case managers and nursing, as they are both involved in the discharge process.

Project Description/Design

Project description

The process objective and a primary goal of the quality improvement project was to reduce 30-day readmissions as compared to the current local organization's readmission rate for patients with diabetes at 20.5%. The project's intervention focused on patients with diabetes who received diabetes education. The DNP project implemented a diabetes evidence-based education program prior to discharge. Measurement of the knowledge outcome was taken twice, before the education program and one week after the diabetes education. The tool used to assess the measurement of knowledge was a questionnaire called the Summary of Diabetes Self-Care Activities (SDSCA). The SDSCA questionnaire was developed by Toobert, Hampson and Glasgow (2000) (Appendix B). Dr Deborah Toobert, author of SDSCA, granted permission to utilize the questionnaire for this project (Appendix C). Additionally, patients were followed for a 30-day readmission. This percentage of readmissions was compared to the current local organization readmission rate for patients with diabetes which was at 20.5%.

The design of the intervention was in alignment with the HBM. The HBM suggests that if a person views his or her condition as a threat and believes that the recommended actions can improve a health outcome, then that person is more likely to adapt the behavior (LaMorte, 2018).

The aim of the diabetes education program was to help patients understand their diabetes. The patients were encouraged to participate in the education program and continue to adhere to the teachings after discharge, therefore improving their diabetes health outcome. According to Peek et al. (2014), low levels of self-efficacy, self-belief, and assurance may negatively impact the adaptation of positive health behaviors and recommended health behaviors. Persons must believe in themselves to move forward with the recommended behavior and self-efficacy can be seen as a predictor of change.

Project outcome and objectives

Project outcome

- The primary goal and objective of the quality improvement project was to reduce 30-day readmissions from the current local organization's diabetes readmission rate of 20.5% for patients on diabetic agents.

Project process objectives

- Participants completed the pre-knowledge SDSCA questionnaire prior to the diabetes education program.
- Participants completed the post-knowledge SDSCA questionnaire seven days later and the mean would improve.

Project outcome objective

- The 30-day readmission rate of the participants on diabetic agents would improve.

Project setting

The implementation of the project occurred at a local organization. The local organization is a single, for-profit, 317-bed acute care hospital in northeast Florida, Clay county. The facility focuses on quality care and extraordinary service. The patients were selected from

the adult medical-surgical units. The DNP lead works at the local organization as a case manager. The diabetes education sessions occurred at the patient's bedside for 30 minutes prior to discharge.

Population and plan for recruitment

The identified accessible participants who were approached and agreed to participate in this project were 15 adult patients admitted to the local organization on a medical floor with a diagnosis of type 1 or type 2 diabetes. The number of participants was the maximum number allowed by the organization due to the ongoing pandemic. The participants were on diabetes agents. Qualified participants who were admitted to the local organization and met the criteria for participation were identified by the electronic medical record (EMR) by the case managers. If participants met the project inclusion and exclusion criteria, then they were eligible for the project. The patients were invited to participate in the diabetes education project and provided with informed consent (Appendix D) that discussed the project's information, purpose, risks and benefits.

Inclusion criteria for the project consisted of:

1. admitted to the inpatient adult medical floor;
2. admitted from home;
3. receiving diabetes agents in the hospital;
4. ages 25 – 60 years of age and can speak and understand English;
5. admitting DRG of type 2 DM with hypoglycemia/hyperglycemia without coma and/or type 2 DM with other specified complication, type 1 diabetes mellitus with hypoglycemia/hyperglycemia without coma, hypoglycemia and hyperglycemia
6. comorbid diagnosis of diabetes;

7. discharge plan is home;
8. patient is able to participate in diabetes self-management daily at home;
9. patient is able to operate a glucometer, interpret the results, follow instructions, obtain supplies for diabetes, and;
10. patient is able to participate in physical activity, assess feet daily and prepare meals.

Exclusion criteria for the project consisted of:

1. patients who had a hospice consult;
2. patients who could not participate in the physical activity plan, assess their feet and prepare meals;
3. patients who were transferred to a different acute hospital, transferred to a psychiatric ward, had orders to discharge to a skilled nursing facility rehabilitation facility, long-term care facility, or jail;
4. patients who were admitted under outpatient status, to labor and delivery, neo-natal unit, intensive care unit, or after surgery;
5. patients who were readmitted to the hospital within the last 30 days and/or hospitalized within three months for diabetes related issues;
6. patients recently diagnosed with diabetes within the past three months;
7. patients who could not care for self and perform activities of daily living, and;
8. patients who required major surgery.

Education program

The DNP lead provided education material from the Association of Diabetes Care and Education Specialists (ADCES) formulary known as American Association of Diabetes Educators (AADE) (Appendix E). The education material was provided to the participants prior

to beginning the diabetes education session. The material consisted of diabetes self-care behaviors for physical activity, healthy eating, blood glucose monitoring, and reducing risks (American Association of Diabetes Educators, 2019). On March 31, 2020, AADE became ADCES to include education specialists as an interdisciplinary organization to improve prediabetes and diabetes. The Association of Diabetes Care and Education Specialists permitted this DNP lead to print and distribute the educational tool handouts as long as the ADCES logo was maintained on all copies (Appendix F). Additionally, a resource booklet was provided to patients in their folder to assist as needed (Appendix G).

Project design process (Appendix H)

1. DNP lead received a list of identified patients from case managers.
2. DNP lead met with the patient at the bedside, obtained consent, and then reviewed the diabetes educational program.
3. DNP lead administered the pre-knowledge SDSCA questionnaire to obtain the baseline knowledge of the participant.
4. DNP lead provided the packet with diabetes education, resource booklet, and post-knowledge SDSCA questionnaire.
5. DNP lead provided a 30-minute diabetes education (AADE7) program.
6. Patient was discharged home.
7. DNP lead contacted the patient to complete a post-knowledge SDSCA questionnaire on day seven.
8. DNP lead followed the patient through the EMR for a 30-day readmission.
9. Data were analyzed. The pre-knowledge and post knowledge SDSCA results were compared.

10. The 30-day readmission follow-up was measured and compared to baseline.

The strength of this approach was that it allowed for the evaluation of the intervention in one local organization. The implementation of the intervention, which was the diabetes education and the pre knowledge and post knowledge SDSCS questionnaires was performed by the same DNP lead who is a case management expert in the field. This provided consistency in the implementation of the project.

Instrument validity and reliability

The instrument that was utilized in the project to evaluate the process outcome of whether the implementation of diabetes education at the hospital bedside improved self-management knowledge and adherence was the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire. The questionnaire assessed diet, exercise, glucose testing, foot care and smoking and was a reliable and valid self-reporting means for diabetes self-management (Toobert, Hampson, & Glasgow, 2000). Mogre evaluated the validity of SDSCA in a study among 187 Ghanaian individuals with type 2 diabetes distributed between three clinics. The SDSCS tool validity was measured via a confirmatory factor analysis (CFA), which kept the four factor structures of SDSCA and that it met its content validity and maintained its floor effect. The Cronbach's alpha of the SDSCS measure was 0.68, with the values of the subscales ranging from 0.61 to 0.84. The study also noted that the tool did not meet criteria for construct validity, but they made known their limitation that they only performed four tests which could have impacted the result. Overall, the study found that SDSCA did meet the recommended criteria for content validity as it measured what it was created to assess (Mogre, Zakaria, Tzelepis, Johnson, & Paul, 2019).

Furthermore, Jannoo and Khan (2018) performed a study to assess the construct validity of the SDSCA through a four and five factor structure that resulted in high fit indices. The cross-sectional research design took place in a hospital and recruited 600 patients. Both structures had indices of CFI above 0.90, which was high. Bujang et al. (2016) performed a study to validate SDSCA in Malaysian adults. The Cronbach's alpha for the main domains were between 0.651 and 0.905. The SDSCA tool proved to be reliable and valid in this setting and recommended as useful to clinicians to improve treatments in diabetes. Therefore, the SDSCA tool was chosen for this project. The SDSCA questionnaire was administered prior to the diabetes education session and seven days later during a follow up phone call.

Evaluation plan

Evaluation of the DNP project was linked to the project goal and objectives. Data collection and protection were considered vital. Data were collected pre-intervention and post-intervention of the diabetes education program. Initially, the data were documented on a paper data collection spreadsheet and later de-identified and transferred to an Excel spreadsheet. The Excel spreadsheet was used to collect and manage data. The data collected reflected pre-intervention results of the SDSCA questionnaire and post-intervention results of the SDSCA questionnaire to compare the results. Additionally, data were collected and recorded if patients were readmitted to the hospital within 30 days of discharge. In summary, the data captured whether participants were readmitted back to the hospital within 30 days of discharge and if there was an improvement in diabetes knowledge.

The excel spreadsheet assisted to correlate data into statistical findings, and that was submitted to the statistician. The DNP lead contacted the Jacksonville University statistician, and the statistician replied with information about guidelines on how to submit data for analysis. The

DNP lead confirmed that 15 participants would be sufficient for a quality improvement project. The method of analysis for readmissions that was used was the Wilcoxon signed rank test as it is best used to test the effectiveness of the diabetes education implementation on a single group (diabetes participants) to detect if the reduction would be statistically significant and if there would be a reduction in the 30-day hospital readmission rate.

Project timeline

The project began May 11, 2020 and was completed March 2021. The timeline was as follows:

Part one: Planning (May 2020 - August 2020)

- Reviewed papers started in EBP I and II for preparation of project and compiled existing project literature and identified gaps
- Met with important stakeholders within the organization to verbally discuss intentions
- Updated and completed literature review and decided on framework to integrate
- Developed process objectives, outcomes objectives and planned for intervention
- Decided on diabetes education that will be provided
- Contacted American Association of Diabetes Educators for permission to utilize AADE7 Self-Care Diabetes Education tool in the DNP project
- Contacted Dr. Deborah Toobert for permission to utilize the tool Summary of Diabetes Self-Care Activities (SDSCA) questionnaire in the project
- Developed measurement tool/data collection spreadsheet, implementation process diagram, conceptual framework diagram
- Developed project proposal to include project design, implementation, instruments, financial assessments

- Wrote up the planned protocol to provide to organizational stake holders
- IRB.net process
- Consulted statistician regarding data analysis plan
- Submitted DNP proposal to Dr. Kott, faculty Chair for review
- Contacted statistician for project review
- Met with Quality Improvement at organization site to receive Site Authorization Letter
- Once DNP Project Proposal was approved, secured IRB approval
- Once approved by IRB, project implementation began

Part two: Implementation (August 2020 to December 2020)

- Prepared a PowerPoint presentation for case manager at the local organization and presented to educate how to identify patients with diabetes for project
- Educated case managers
- Prepared folders for patients with the diabetes education handouts, resources and post-knowledge SDSCA questionnaire
- Implemented the diabetes AADE7 inpatient bedside diabetes self-management education for one session prior to discharge from the facility. Patients were approached from 9/21/20 through 11/21/20. Data was collected for an additional 30 days.
- Performed the pre-knowledge SDSCA questionnaire prior to the start of the diabetes education
- Administered the post-knowledge SDSCA questionnaire on day seven

Part three: Evaluation (January 2021 to March 2021)

- Findings evaluated and written up
- The results from the pre/post knowledge SDSCA questionnaires evaluated

- Statistician consulted to provide analytical findings for statistical interpretation of data
- Prepared a PowerPoint Presentation for DNP final defense with project findings and for organization's stakeholders
- Completed DNP portfolio
- Disseminated project findings to the Diabetes Educator Journal
- Submitted DNP final project to Virginia Henderson e-repository

Assurance and confidentiality

The DNP project proposal was presented to the Jacksonville University Institutional Review Board (IRB) and the local organization IRB as a quality improvement project. The intervention was low risk and in line with quality improvement interventions. The project benefit suggested a reduction in diabetes admissions, an improvement of patient outcomes and satisfaction. The 15 participants were monitored for readmission 30 days after discharge. The DNP lead had access to the patients' medical records 30 days post-discharge. Additionally, on day seven, the patient was called for a follow-up post-knowledge questionnaire by telephone. The consent reflected that the phone number will be collected for a follow-up phone call. No fully identifiable data were collected. All personal identifying data was de-identified by a coded number and the coding sheet was stored separately. Data were entered and stored in a secure database at the local organization with a protected password and encrypted server. The Health Insurance Portability and Accountability Act (HIPAA) privacy rule was used as it protects participant privacy and health information, which included electronic data and the information that was collected. The organization's system was secure and HIPAA compliant.

The data were transferred to an Excel file and securely transferred into the University's One drive. This is a shared secure folder because it is protected by the University firewall and is

password protected. Any paper documents were kept in the DNP lead's clinical office in a locked cabinet in a locked office.

Patients selected for the project received an explanation of the project and written consent was obtained. The opportunity to opt out of the project during the course of the study with no repercussions or changes to the standard of care that the patients would receive was provided to the participants. The consent form explained the project's purpose, procedure, confidentiality, risks, benefits, withdrawal, as well as the DNP project lead and Chair contact information. The DNP lead was available for questions when necessary.

Plan for IRB approval

The DNP project lead, Chair and statistician completed the Protecting Human Research Participants course and received a National Institutes of Health (NIH) Certificate. Additionally, coursework requirements were completed, and a certificate was earned in the Collaborative Institutional Training Initiative (CITI Program). The DNP project proposal was first submitted to Jacksonville University IRB Committee for approval. To protect human rights and the agency in the project, the DNP project proposal was further presented to the local organization IRB who reviewed the proposed project and ensured the study would be conducted ethically.

All required forms were completed and sent to the Jacksonville University Institutional Review Board (IRB). These forms included Site Authorization Letter, Investigator Assurance Form, QI/QA Form and Mentor agreements signed. The CITI training certificate was uploaded. The Jacksonville IRB granted approval to move forward with QI implementation.

Stakeholder assessment

Stakeholder assessment and the organization's readiness to change were important to assess prior to the implementation of the project. The stakeholders involved in this DNP project

were the organization's case management director and manager, chief nursing officer and quality improvement department. A meeting was arranged with the organization's case management director and manager and the project idea and implementation process was discussed. They both were willing to bring about change to adapt diabetes education prior to patient discharge. They both agreed that despite various approaches made by hospitals, readmissions of patients with diabetes within 30 days of discharge remains to be a common hospital readmission. Their case management experience had provided them with knowledge that effective diabetes education reduced hospital readmissions. This DNP project supported that knowledge.

To obtain approval to implement the project at the local organization, a Site Authorization Approval was needed. Therefore, the DNP lead arranged a meeting with the organizational stakeholders, the Quality Improvement Department, and collected information on the necessary steps to obtain site authorization. An Application for Clinical Research was submitted along with a project protocol, Curriculum vitae, copy of informed consent, copy of Citi training, PDSA cycle, case management teaching strategy, letter of support from director, diabetes education material to be used, and a Note to filing explaining missing information. Additionally, a PowerPoint Presentation was created and presented to the Clinical Research Oversight Committee. An operational approval with a Site Authorization Approval letter was granted.

The Clinical Research Oversight Committee requested this DNP lead to return with the results from the study as they had gained interest in the project during the presentation. The DNP lead will request the Chief Nursing Officer (CNO) be present as the nursing discharge process needs to be modified. To motivate willingness for change, it will be highlighted that this quality improvement project had practical implications to nursing. Nurses provide discharge

instructions and education to patients; thus, diabetes discharge knowledge is important in reducing readmissions to the hospital. Additionally, this organization once had diabetes educators that provided inpatient diabetes education prior to discharge, and therefore this would not be a new concept to this facility.

Project financials

Funding to support the project was mainly supported by the DNP project lead and the organization (Appendix I). The total cost was \$102. The cost to acquire permission to utilize the SDSCA knowledge questionnaire was \$25, which was paid for by the DNP lead. Copies made at the local library were \$0.10 per page. The cost of the SDSCA questionnaire to print 60 pages was \$6. Permission to use the AADE7 handouts was granted without cost and copies of the original education documents with the ADCES logo was covered by DNP lead. The cost to print 360 pages of AADE7 handouts was approximately \$36.00. The education material and resource book were placed in a folder, and the cost for 15 folders was \$15. The resource booklet was covered by the organization. Travel expenses, gas, mileage and time for patient bedside education was paid for by the DNP lead.

Project sustainability

The results of the project were de-identified and shared with the case management department manager and director and will be shared with the Clinical Research Oversight Committee at the local organization. The results of this project have practical implications for case managers and nursing, as they are both involved in the discharge process, provide discharge instructions and education to patients, and many times are the discharging nurse. Diabetes knowledge and discharge planning is crucial in reducing readmissions to the hospital. This is important to case managers and nursing as they take part in the discharge process and can help

reduce diabetes readmissions through their practice and education. Plan for ongoing sustainability involves teaching case managers how to perform diabetes education and proposing that a case manager be designated for diabetes education exclusively, as they would be able to incorporate diabetes education during the patient's discharge planning session. Sustainability will rely on the support of the case manager director if she believes the education program will assist in the reduction of readmissions. Another possibility would be to have a diabetes educator on staff designated to perform just inpatient diabetes education.

In a pilot program by Sullivan and Alexander (2019), a case manager provided health coaching for patients with type 2 diabetes to decrease 30-day hospital readmissions. The program took place in an acute care hospital and one case manager enrolled 20 patients. Health coaching involved diabetes self-management skills, medication adherence and following the patients for 28 days with four telephone follow-up calls to survey reached goals, answer any questions and verify if the patient remained out of the hospital. Case managers have an important role in the hospital setting that involves discharge planning to reduce hospital readmissions, therefore they are positioned perfectly to improve outcomes in patients with diabetes and reduce hospital costs. The program was successful and 16 of the 20 patients remained out of the hospital. A moderate salary for a case manager is around \$53,000 a year and to reduce hospital readmissions with such an impact may be worth looking at (Sullivan & Alexander, 2019).

Dissemination

The DNP lead plans to disseminate the information learned and gathered from the quality improvement project. Plans for sharing the results include submission of a manuscript for publication, as well as sharing the project results with the local organization case manager director and stake holders. The DNP will disseminate the project results to other community

stakeholders. A PowerPoint presentation will be prepared and presented for the DNP final defense with project findings. Findings will be presented to the organization's Clinical Research Oversight Committee as they had granted permission to implement the project at the facility. The manuscript will be submitted to *The Diabetes Educator* journal. The final project will also be submitted to the Virginia Henderson e-repository. Planning to attend community fairs and events and giving presentations are effective ways to reach individuals in the community.

Dissemination of learned knowledge from quality improvement is an important aspect of adding to the body of nursing knowledge.

Findings

The primary goals of this QI project were to reduce 30-day readmissions from the current local organization rate of 20.5% and improve diabetes knowledge through the implementation of evidence-based diabetes education at the hospital bedside prior to discharge home. This aligned with the purpose of the QI project which intended to explore that if among adult patients diagnosed with diabetes, diabetes education reduced 30-day readmissions to the hospital. In this QI project, the participants received diabetes AADE7 self-management education, including information about healthy eating, being active, glucose monitoring, and reducing risks of diabetes prior to discharge. The QI project 1) had participants complete a pre-knowledge SDSCA questionnaire prior to the diabetes education program; 2) had participants complete a post-knowledge SDSCA questionnaire seven days later after the diabetes education program; and 3) assessed the 30-day readmission rate of the participants on diabetes agents. The knowledge level improved and the 30-day readmission rate improved. The 30-day readmission rate of the 15 participants was compared to the organization's readmission rate for patients on diabetes agents at 20.5%.

Demographics

The 15 participants who took part in the project were all between the ages of 29-60, which met the project criteria requirements. Only 13 of the participants completed the pre and post SDSCA knowledge questionnaire, therefore only 13 participants were analyzed by the statistician. The mean age of the 13 participants was 50.15 and the median age was of 54 (Standard Deviation = 9.15). Men accounted for 6 participants (mean 3.08). Women accounted for the remaining 7 participants (mean 1.83).

Primary goal 1: Did diabetes education reduce 30-day readmissions from the current local organization readmission rate of 20.5%?

The cohort that was followed for 30 days for a 30-day readmission consisted of 15 participants, all which were part of the pre- and post-implementation process. All 15 participants were followed from day one following their discharge home from the hospital to monitor for 30-day readmissions. There was a zero percent readmission rate. No patients who participated in the diabetes education program were readmitted within 30 days of discharge to the local organization. The self-management diabetes education program was shown to have a positive impact on the readmission rate at the local organization. Goal one, the primary goal of this QI project, was met.

Goal 2: Did diabetes education improve diabetes self-management knowledge and adherence at one week post education session?

The cohort for which the SDSCA questionnaire evaluation was completed consisted of 15 participants all which were part of the pre- and post-implementation process. All participants completed a pre-knowledge SDSCA questionnaire prior to the diabetes education at the bedside prior to discharge home. However, only 13 participants responded to the follow-up post-

knowledge SDSCA questionnaire that took place by a follow up telephone call seven days later. The pre- and post-knowledge and adherence rates to SDSCA activities are summarized in Table 1. The results reflected an overall improvement in self-management diabetes knowledge and adherence to SDSCA activities, which were healthy diet, physical activity, glucose monitoring and daily foot checks.

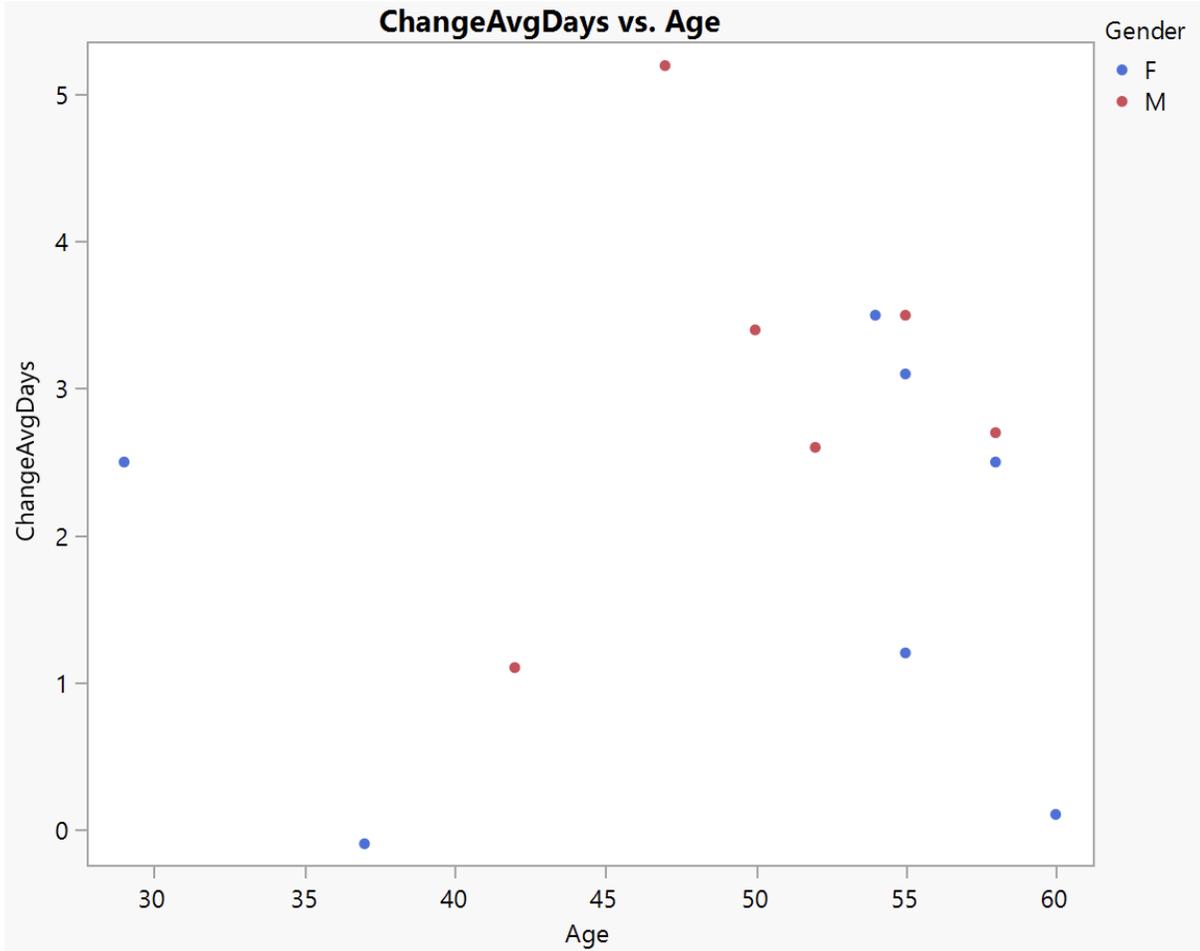
Consultation with the statistician reflected that a score was found for each of the 13 participants who completed the pre- and post-knowledge SDSCA questionnaires. Total score consists of the sum of the responses for questions 1 through 10 (Pre-total and Post-total). These total scores were normalized by dividing by 10 to produce Post-Average-Days and Pre-Average-Days. Then, to calculate the change in the average days, Change-Average-Days = Post-Average-Days minus Pre-Average-Days. There was significant change from pre to post (p value < 0.0001 for paired t-test, p value = 0.007 for Wilcoxon signed rank test). The normal qq-plot for Change-Average-Days indicated that normality was a reasonable assumption so the estimated change of 2.41 days in Change-Average-Days lead to a 95% confidence interval of 1.51 to 3.31 days. That is, the intervention was associated with an average increase (change) of between 1.51 and 3.31 days across the 10 questions. The average change for females (1.83) and males (3.08) was not significantly different ($t = 1.613$, $p = 0.135$; the Wilcoxon was also non-significant at 5% ($p = 0.134$)). This may be attributable to the small sample sizes. A scatter plot, which is summarized in Scatter Plot 1, showed no apparent relationship between change pre to post and patient age. The statistician constructed several models involving pre, post, change, gender and age, none of which showed significant relationships (Wludyka, 2020). These results indicated that the self-management diabetes education program had a significant improvement on the participant's diabetes knowledge and self-management adherence at home, thus meeting the second goal.

Table 1

Variable	N	Mean	Standard Deviation	Median	Lower Quartile	Upper Quartile
Age	13	50.15	9.15	54	44.5	56.5
Pretotal Q1-Q10	13	26.69	16.39	28	14	35
Posttotal Q1-Q10	13	50.76	9.63	53	41	57.5
Change Total	13	2.40	12	3	.25	4.25
PreAvg Score	13	2.66	1.63	2.8	1.4	3.5
PostAvg Score	13	5.07	0.96	5.3	4.1	5.75
Change in Avg Score	13	2.40	1.48	2.6	1.15	3.45

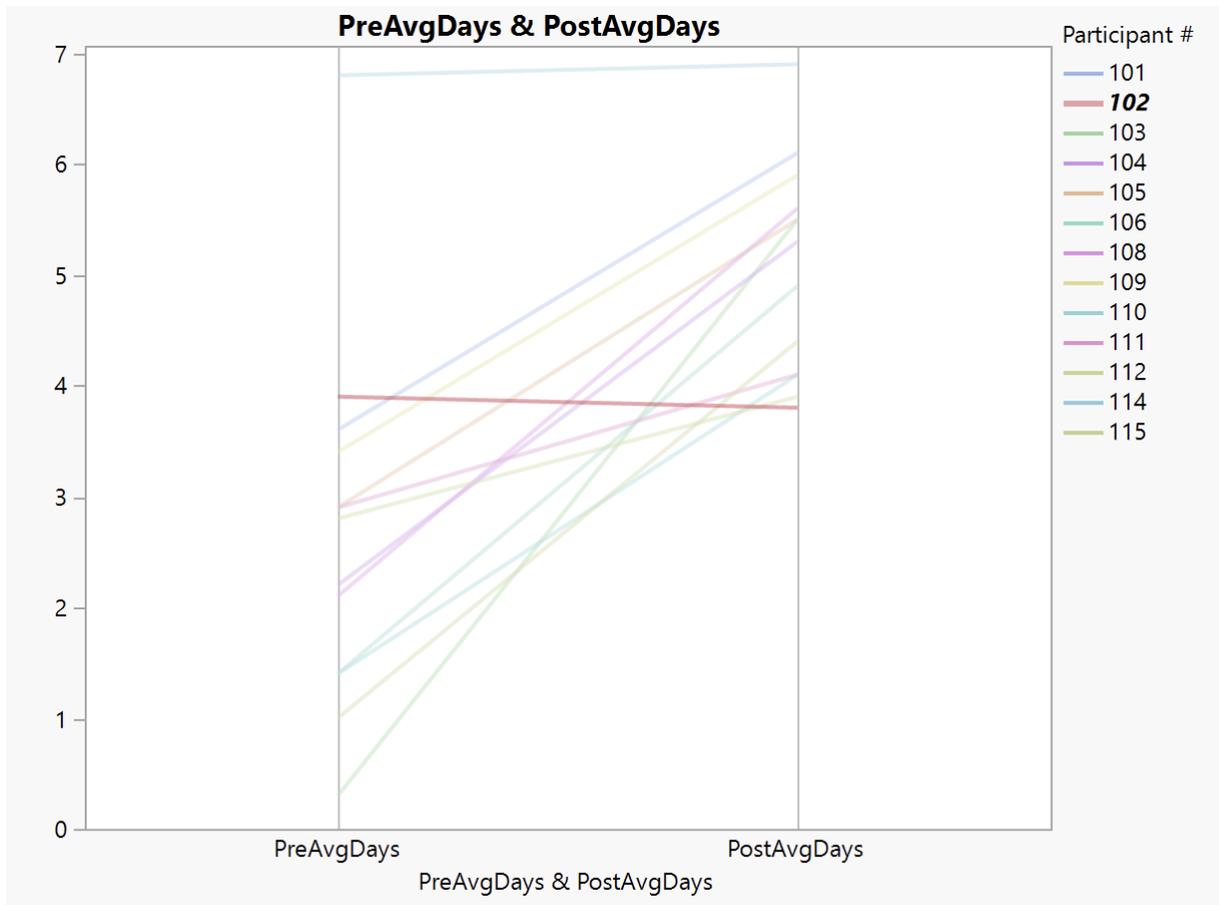
The scatter plot below shows the relationship between change and age with gender. There is no apparent pattern relating change to age for males or females. The male change is somewhat higher than the female change.

Scatter Plot 1



The graph below summarizes the presentation analysis as it reflects a visual description of the implementation. The graph depicts the 13 participants, the Pre-Average-Days were subtracted from the Post-Average-Days to reach the Change-Average-Days. There was a significant change from the Pre-Average-Days to the Post-Average-Days, 2.41 days, interval of 1.51-3.31 days, implying that the diabetes education contributed to a significant improvement in the participants' diabetes knowledge and self-management adherence.

Graph 1



Facilitators, Limitations and Consequences

Facilitators

The main facilitator of this QI project was providing the diabetes self-management education program at the hospital bedside prior to discharge from the hospital and monitoring for a 30-day readmission at the local organization. Patients were able to receive diabetes education and appropriate resources prior to discharge from the hospital. Diabetes education was provided for 30 minutes at the hospital bedside with time for questions and a folder with educational material was sent home with the patients. Then, seven days later, the patients received a follow-up phone call from the DNP lead to perform the SDSCA diabetes knowledge questionnaire and answered any questions.

Another important facilitator was the theoretical framework used to guide the intervention of this QI project, which was found to be valuable. The design of the intervention was done in alignment with the Health Belief Model. The Health Belief Model suggests that if persons view their condition as a threat and they believe that the recommended actions can improve their health outcome, then they are more likely to adapt the behavior (LaMorte, 2018). The diabetes education aimed to assist patients to understand their health condition and encouraged them to participate in the diabetes self-management education. Additionally, the diabetes education also encouraged the participants to adhere to the advice after discharge to improve their diabetes health outcome. Persons must believe in themselves to move forward with recommended AADE7 self-care behaviors and self-efficacy can be seen as a predictor of change (Peek et al., 2014).

Also used as a facilitator was the quality improvement model, Plan-Do-Study-Act, which supported the idea of the implementation of inpatient self-management diabetes education at the local organization and whether it would result in an improvement in diabetes 30-day readmissions (Edupuganti, Bushman, Maditz, Kaminoulu, & Halalau, 2019). This model served as a guide throughout the DNP project as it allowed time to plan for the project, perform it, study, analyze and reflect on the results.

Limitations and barriers

There were some limitations to the QI study. The small sample size of only 15 participants and the short duration of the project being only three months are important to note. There were no 30-day readmissions based on diabetes agent of the patient to the local organization, however it is unknown if patients were readmitted to a different organization. Two of the participants did not answer the call to participate in the follow up post-knowledge SDSCA

questionnaire seven days after the first meeting. This reduced the statistical calculations from 15 to 13 participants. The project included the distribution of the SDSCA questionnaire, which relied on the patients' accurate self-reporting of information. Inaccurate self-reporting could have skewed results. Initially, not all the participants were enthusiastic about the diabetes education, therefore the DNP lead is not sure how much of the education was missed during the beginning of the presentation. Also, when patients do not feel well, as they were hospitalized, they are less likely to retain educational information. Finally, the lack of comparative data to relate intervention results from the SDSCA questionnaire was also a limitation.

Important barriers that were noted during the diabetes education session by the DNP were that some patients had limited or no prior diabetes education, no means to acquire healthy food, no transportation, lack of a glucometer, no desire to eat healthier or exercise, lack of insurance, resources, support and money, lack of primary care physician and follow up care, not taking medications as indicated, not monitoring blood sugars as prescribed, not checking their feet, and no desire to cease tobacco. Overall, it was noted that not all patients had a similar baseline of diabetes knowledge or desire to improve or change their diabetes habits. The leading barriers identified were lack of diabetes education, resources, follow up care and health insurance.

Consequences

There were positive consequences that occurred as a result of the DNP project. Patients who received diabetes education prior to discharge home from the hospital were provided with diabetes education and resources, which is not the standard at the local organization. As a result, several patients took interest in the educational program provided and made decisions to follow and adhere to the diabetes education provided. Some patients did not own a glucometer or seem to think that monitoring their blood sugars was important but after the diabetes education,

resources and assistance were provided, and they received a glucometer and the education necessary to utilize it. If the DNP lead identified discharge needs or barriers during the SDSCA knowledge questionnaire and diabetes self-management education program, the patient was also referred to the case manager to ensure the issue was taken care of prior to discharge. For example, patients with no insurance may have needed glucometers, diabetes medication, supplies, transportation or follow up appointment assistance. Since the DNP lead is a case manager at the local organization, this process was coordinated efficiently.

During the follow up phone call that was made seven days after the first meeting, several patients shared their positive stories about how they had progressed. One female patient acknowledged that she was feeling much better since she started keeping a log of her blood sugars and tracking what she ate on a mobile app. She also started to incorporate exercise and checking her feet daily. The participant stated she never had anyone who cared to provide her with such helpful information and the fact that she received a follow-up call encouraged her to continue on her plan. Another female patient who was admitted with DKA and AKI, worked in the kitchen in a nursing home and had diabetes diet knowledge, but did not incorporate physical activity, blood sugar monitoring and foot care. During the follow up phone call, she expressed her gratitude for the diabetes education. She also stated her husband has type 2 diabetes and that she provided him with the diabetes education from the folder provided and that they attended a virtual diabetes education class together. The folder that the patients were sent home with had information about diabetes classes that they could attend live or virtual. Another patient, who is a school bus driver, admitted to little adherence to the diabetes self-management behaviors that were discussed. She also stated that since the DNP lead took the time to call and speak to her, she felt compelled to begin logging in her blood sugars and tracking her food intake. The DNP

lead took the time to go over the diabetes education material over the phone to refresh her memory so that she may adhere to the self-care behaviors. All questions were answered, and the conversation ended on a positive note with the patient planning to schedule a follow up endocrinologist appointment for diabetes follow up care.

The most challenging type of patients were those with no insurances, no resources, no follow up care and limited diabetes education. A male patient that was admitted with uncontrolled hyperglycemia and a diabetic foot ulcer was one of participants who required additional assistance. In this particular case, the DNP lead worked closely with the case manager to ensure the patient was discharged with all necessary education, medication, supplies, follow-up appointments and equipment. During the SDSCA questionnaire and diabetes education session, the DNP lead noted the limited diabetes education, resources, no primary care and lack of health insurance. All these concerns were addressed with the case manager. During the seven day follow up phone call, the patient improved significantly on the SDSCA diabetes knowledge questionnaire and discussed ways he started to adhere to the self-care behaviors shared during the diabetes education session provided. He stated he had the diabetes education folder provided and that he had read it in its entirety and had created a glucose monitoring log, food log, activity log and had his first follow-up appointment the following week. Several patients benefited as a result of the QI project.

Recommendations, Implications and Sustainability

Recommendations

Recommendations for future projects would be to increase the sample size of participants over a longer period of time and to have comparative data to relate interventional results from the SDSCA questionnaire. It is reasonable to compare SDSCA scores between different genders and

ages of participants. Future projects to address the impact of diabetes education in the hospital setting and reduction of readmissions are recommended. There is a need for more evidence-based research to evaluate which diabetes educational strategies work best. Furthermore, it should be taken into consideration that various discharge planning strategies are necessary as patients come with different cultural beliefs, financial means, and health literacy.

Implications for practice

Despite various approaches made by hospitals, readmissions of patients with diabetes within 30 days continues to be a problem. There is evidence that effective evidence-based diabetes education does reduce hospital readmissions. Implications of this QI project includes providing health care organizations with evidence-based diabetes self-management education that can be provided at the hospital bedside prior to discharge. Patients will benefit from diabetes self-care education, survival skills, resources and follow up assistance at discharge. Organizations will benefit from a reduced diabetes 30-day readmission rate which can be converted into monetary savings. Furthermore, the organizational benefits can impact the quality of health indicators, hospital cost savings, staff satisfaction, and patient satisfaction, thus improving its overall throughput.

Also, implications of this QI project for future practice include providing nurses with evidence-based diabetes education. Nurses are involved in the discharge process, providing discharge instructions and education to patients. Often nurses are the discharging nurse, thus diabetes discharge knowledge and planning are crucial in reducing readmission to the hospital.

Sustainability

For sustainability of the QI project, the DNP lead provided the case management director and manager and Clinical Research Oversight Committee with the diabetes self-management

education program, SDSCA tool and resources provided to patients. A PowerPoint Presentation was created and will be presented to the Clinical Research Oversight Committee per request. The committee showed great interest in the QI project proposal when it was approved to be performed at the local organization. During this future presentation at the Clinical Research Oversight Committee, the director, manager, Chief Nursing Officer and other key stakeholders will be present and the DNP lead will have the opportunity to defend the QI project and propose its implementation at the local organization. Implementation of the diabetes self-management education program prior to discharge will need to be approved by the committee and then budgeted into the case management department. The plan will be to also propose a trial using the DNP lead as the diabetes educator for three months as no training would be required.

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Appendix A

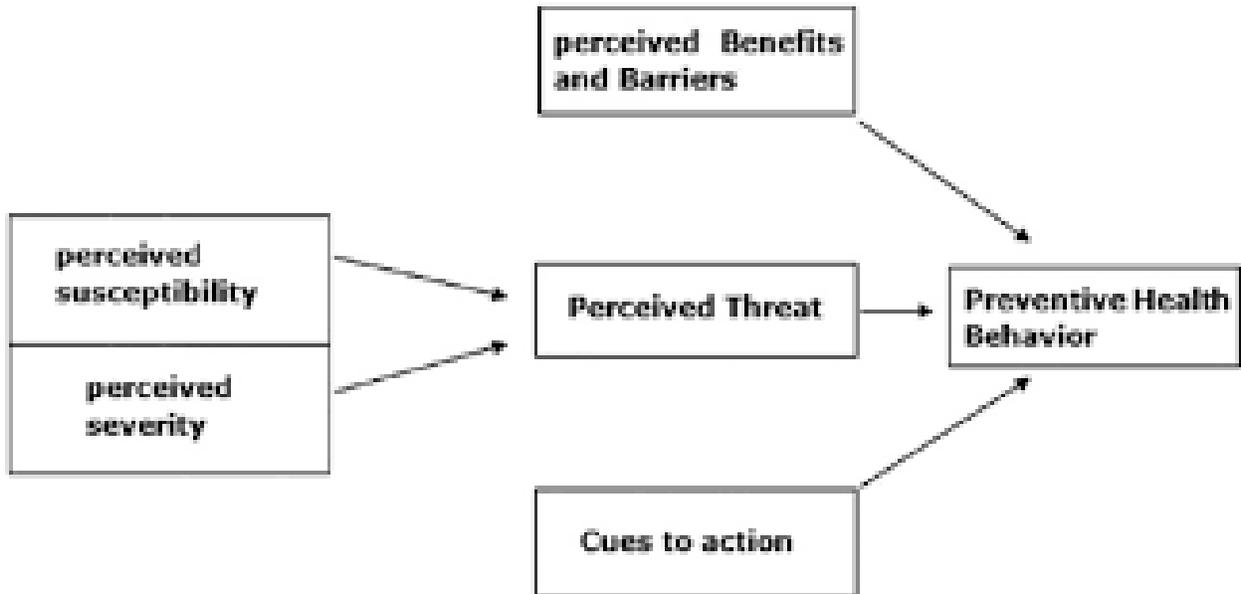
Health Belief Model

The Health Belief Model (HBM) is a behavioral health theory. It proposes that if a person personally views their illness as a personal threat and they believe that the recommended health action can improve their health outcome, then they are more likely to adapt the behavior (Preventative Health Behavior).

Individual Perceptions

Individual Health Beliefs

Adapted Behavior



Appendix B

SDSCA Questionnaire

Summary of Diabetes Self-Care Activities Questionnaire

The questions below ask you about your diabetes self-care activities during the past 7 days. If you were sick during the past 7 days, please think back to the last 7 days that you were not sick.

Diet

Number of Days

1. How many of the last SEVEN DAYS have you followed a healthful eating plan? 0 1 2 3 4 5 6 7
2. On average, over the past month, how many DAYS PER WEEK have you followed your eating plan? 0 1 2 3 4 5 6 7
3. On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables? 0 1 2 3 4 5 6 7
4. On how many of the last SEVEN DAYS did you eat high-fat foods, such as red meat or full-fat dairy products? 0 1 2 3 4 5 6 7

Physical Activity

5. On how many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity? 0 1 2 3 4 5 6 7
(Total minutes of continuous activity, including walking).

6. On how many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work? 0 1 2 3 4 5 6 7

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Blood Sugar Testing

7. On how many of the last SEVEN DAYS did you test your blood sugar? 0 1 2 3 4 5 6 7 Number of Days
8. On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health-care provider? 0 1 2 3 4 5 6 7

Foot Care

9. On how many of the last SEVEN DAYS did you check your feet? 0 1 2 3 4 5 6 7
10. On how many of the last SEVEN DAYS did you inspect the inside of your shoes? 0 1 2 3 4 5 6 7

Smoking

11. Have you smoked a cigarette, even a puff, in the past SEVEN DAYS? 0 No 1 Yes ≡ 11a. How many cigarettes did you smoke on an average day?
- Number of cigarettes:

Scoring Instructions for the Summary of Diabetes Self-Care Activities

Scores are calculated for each of the five regimen areas assessed by the SDSCA: Diet, Exercise, Blood-Glucose Testing, Foot Care, and Smoking Status.

Step 1

For items 1–10, use the number of days per week on a scale of 0–7. Note that this response scale will not allow for direct comparison with the percentages provided in Table 1.

Step 2: Scoring Scales

General Diet = Mean number of days for items 1 and 2.

Specific Diet = Mean number of days for items 3 and 4, reversing item 4 (0=7, 1=6, 2=5, 3=4, 4=3, 5=2, 6=1, 7=0). Given the low inter-item correlations for this scale, using the individual items is recommended.

Exercise = Mean number of days for items 5 and 6.

Blood-Glucose Testing = Mean number of days for items 7 and 8.

Foot Care = Mean number of days for items 9 and 10.

Smoking Status = Item 11 (0 = nonsmoker, 1 = smoker) and number of cigarettes smoked per day.

Appendix C

Permission to Use SDSCA Tool

Permission to use the Summary of Diabetes Self-Care Activities Questionnaire in your research



Deborah Toobert <Deborah@ori.org>

Thu 6/25/2020 10:30 PM



To: Buiuciu, Nicoleta

SDSC-7studies-measure-rev ...
94 KBSummary of Diabetes Self-Di...
32 KBSummary of Diabetes Self-Ca...
20 KB

3 attachments (146 KB) Download all Save all to OneDrive - Jacksonville University

CAUTION: This email originated from outside of Jacksonville University. DO NOT click links or open attachments unless you recognize the sender and are expecting the information or have verified via other means that the sender and content is safe.

Dear Nicoleta,

Thank you for your payment of \$25 for permission to use the Summary of Diabetes Self-Care Activities Questionnaire (SDSCA) in your study. Now that we have received your payment, you have our permission to use the English version of the Summary of Diabetes Self-Care Activities Questionnaire in your research project and we will be able to provide answers to any questions you may have. We have attached the 2000 Diabetes Care article with the SDSCA psychometric information. At the end of the article, there is an appendix with the English version of the questionnaire, and the scoring information. We have also attached a user-friendly copy of the English version of the SDSCA instrument.

If you need a translation of the SDSCA please contact me first, as the SDSCA has been translated into many languages. There will be no further charge.

Please be sure to check our website first for the most frequently asked questions:

<http://www.ori.org/sdsca>

We wish you every success with your research,
Deborah

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Appendix D

Consent Form



INSTITUTIONAL REVIEW BOARD (IRB):

**INFORMED
ADULT CONSENT
Quality Improvement**



COVID -19- Message to Quality Improvement Participants

Please Read and Sign

Jacksonville University takes the safety of our quality improvement project participants very seriously. We need to provide you with important information about the coronavirus, which is also called COVID-19. It is a virus that can be spread from person to person. We need to tell you about ways your participation in this study might change because of the risks caused by the coronavirus.

If you are considering joining this quality improvement project, it is important that you consider the following information to determine if study participation is right for you at this time.

How is COVID-19 spread?

Can COVID-19 be prevented? Current ways to minimize the risk of exposure to COVID-19 include “social distancing” which is a practice to decrease the potential for direct exposure to others who may have been exposed to COVID-19, for example by avoiding large gatherings or refraining from shaking hands with others. It is important to understand that since your participation may include increased travel outside of your home and increased exposure to others within a clinical care environment or research site (e.g., dance studio, JU Campus) that your possible exposure to COVID-19 may increase.

What are the risks of COVID-19? For most people, the coronavirus causes only mild or moderate symptoms, such as fever and cough. For some, especially older adults and people with existing health problems, it can cause more severe illness, including pneumonia. While we are still learning about this virus, the information we have right now suggests that about 3 out of 100 people who are infected might die from the virus.

Who is most at risk? Individuals over 60 and those with chronic conditions such as cancer, diabetes, and lung disease have the highest rates of developing serious complications from the virus.

How could your participation in this quality improvement project change as a result of COVID-19?

There are several ways for us to try to lower your risk of exposure.

- The project lead may limit the number of times you come to a clinical care or research/project site, as for example, the JU Campus, an offsite clinic, or dance studio. Please know that by coming to a project site, you are assuming the risk of exposure to the coronavirus (or other public health risks). This risk may increase if you travel by public transportation, cab, or ridesharing service.



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Do not come to the JU campus or a research/project site if you or someone in your household has tested positive for COVID-19 in the past 14 days, or if you are exhibiting symptoms of illness such as fever, cough or shortness of breath.

For JU research/project sites, before coming to campus, visitors must review a medical disclosure statement (see below) acknowledging that they have followed a series of steps to check their health and that they will comply with University policies, including bringing a mask to wear on campus. Those unwilling to comply with policies regarding social distancing and masks will be asked to leave campus. For other research sites, e.g., dance studios, or clinics, please inquire about site specific policies.

- **JU's Medical Disclosure Statement:** Visitors with members of their household who have tested positive for COVID-19 in the past 14 days or who are exhibiting symptoms of illness such as fever, cough or shortness of breath are not permitted on campus. Please perform a self-health check and take your temperature prior to arriving on campus to ensure you are not exhibiting COVID-19 symptoms and your temperature reading is below 100.4 degrees F. *Please note Jacksonville University reserves the right to temperature check visitors upon arrival to campus.*

If there is a reappearance of the COVID-19 virus or if other health concerns arise, the project lead may substitute face-to-face interactions with remote contact options such as using the phone, Zoom, or other means, whenever possible.

If a face-to-face interaction or intervention is required, the project lead may pre-screen for COVID-19 over the phone. As part of the pre-screening process, you will be asked if you have had symptoms of COVID-19 or have been in close contact with anyone who has or had COVID-19. If you have a positive risk/symptoms screening, please consult your healthcare provider, visit the Florida Department of Health COVID-19 Response website, or call center for further information.

- Florida Department of Health COVID-19 Response Team ○
Website: <https://floridahealthcovid19.gov/>
○ 24/7 Call Center: (866) 779-6121
○ Email: COVID-19@flhealth.gov

Project participants with possible exposure or symptoms of the illness may be rescheduled if medically cleared for COVID-19, excluded, or withdrawn from the study.

The project lead may try to reduce the time you are exposed to other people/participants as much as possible. For example, the project lead may limit the number of participants at the site by providing individual appointment times.

Form Created on 1/17/2019

Form Revised on 09/25/2019



Office of Research
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JACKSONVILLE UNIVERSITY



IRB APPROVAL

Project: 2020-055

Approved: September 10, 2020

Expiration: Quality Improvement Project

INSTITUTIONAL REVIEW BOARD (IRB):

INFORMED CONSENT Quality Improvement

- The project lead will use masks, gloves, face-shields, etc., to minimize your exposure. Participants will also wear masks, gloves, and clean their hands often while on the research site or the JU campus. For JU research sites, all guests and visitors must bring their own face coverings and wear them in the designated mask-required areas or when interacting with people on campus.
- If during the course of the project you are suspected to be positive for COVID-19, there may be last minute changes to how procedures are performed (such as a change from an in-person visit to a telephone call) or cancellations of research tests or procedures to ensure your safety. It is even possible that your research procedures will be put on hold or stopped because of COVID-19.
- Participants will inform the members of the research team if there is a change on their health status.

The information related to risks of COVID-19 changes every day. Jacksonville University continues to monitor the risks and make decisions about how these risks should change our research process. If you have questions about COVID-19 and your participation in this quality improvement study, please talk to your project lead.

1. Acknowledgements

____I have read the COVID-19 message to project participants, and have been given the opportunity to ask questions. Based on this information,

_____I agree to participate in this project. I understand that people infected with COVID-19 may not show symptoms, but they may still be highly contagious. I understand that Jacksonville University, the project leads, and project staff will use various strategies such as social distancing to lower the spread of COVID-19 while participating in this project. However, given the nature of the virus, I understand that even with these strategies in place, there is a possibility that I can become infected with COVID-19. I assume the risk of potentially becoming infected with COVID- 19 by voluntarily consenting to participate in this project.

Participant's Name: _____
Participant's Signature: _____ Date: _____

_____I do not wish to participate in the study. (Stop here, and please return this document to the researcher. Thank you for your time and consideration).

If you agree to participate, please continue with the consent process.

Form Created on 1/17/2019
Form Revised on 09/25/2019



INSTITUTIONAL REVIEW BOARD (IRB):

INFORMED CONSENT Quality Improvement

Title of the Project: Diabetic Education to Reduce Readmission of Patients with Diabetes **DNP Student Project Lead:** Nicoleta Buiciuc, MSN, APRN, FNP-BC, Jacksonville University **Faculty Advisor:** Kathryn Kott, Ph.D., APRN, FNP-C, Jacksonville University
Project Statistician: Shiva, Gautam, PhD, Jacksonville University

You are invited to participate in an Evidenced Based Diabetes Education Program as part of Jacksonville University, Keigwin, School of Nursing, Doctor of Nursing Practice (DNP) student improvement project. The project will be supervised by the DNP Faculty Chair listed above, Dr Kathryn Kott.

In order to participate, you must be 25-60 years of age and can speak and understand English. You must be admitted to the hospital with a plan to discharge home. You must have a diagnosis of diabetes and be receiving diabetic medications in the hospital. Taking part in this project is voluntary.

The purpose of the project is to evaluate if providing diabetes education prior to discharge from the hospital can help reduce readmissions to the hospital within 30 days. In order to measure this, the project will compare the percentage of readmissions to the baseline after the implementation. The project will also evaluate if diabetes education in the hospital will help you manage your diabetes better. Fifteen participants are expected to complete the project.

If you agree to take part in this project, you will be asked to meet with the Student Project Lead for 30 minutes of diabetes self-management education at hospital bedside. Your name will be coded by numbers and no identifying information will be associated with your name. Before I provide diabetes education, you will be asked to fill out a questionnaire with 11 questions on how you take care of your diabetes at home. This will take approximately 7 minutes. I will collect the completed questionnaire and your phone number to follow up with you seven days after our first meeting. At this time, you will be asked to complete the same questionnaire. Your medical record will be followed for 30 days post discharge for readmission. I will collect the following data from your records: your phone number in order to call and perform a questionnaire posttest and if readmitted within 30 days of discharge. Your data will not be linked to other data, research, protected health information, or administrative data or US Census data.

There are some risks and or discomforts you might experience from being in this educational project. These are breach of confidentiality. To minimize this risk, your data will be entered and stored in the secure database at the local organization within a protected password and encrypted server that is HIPAA compliant. All paper will be shredded once transferred into the computer. The project folder stored on the server is also password protected and can only be accessed by the project team. The paper copies of all consents will be stored in a locked filing cabinet at the local organization. Only the student Project Lead, JU Faculty Chair and JU Statistician will have access to the file.

Form Created on 1/17/2019

Form Revised on 09/25/2019 4



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You may benefit from being in this diabetes educational project because you will receive free diabetes self-management education. Readmission rates may be reduced within 30 days with diabetes education. Others might benefit from the knowledge learned from the education project.

If you decide to take part in the education project, it should be because you really want to volunteer. You will not lose any services, benefits, or rights you would normally have if you chose not to volunteer. If you are a patient, nothing about your medical status or services will change no matter what you decide.

If you are interested in learning more about the diabetes education project, please continue to read below. If you are not interested stop here.

Thank You.

INFORMED CONSENT Quality Improvement



PARTICIPANT'S NAME (Print):

TITLE OF THE PROJECT: Diabetic Education to Reduce Readmission of Patients with Diabetes

PROJECT LEADS:

Education Program DNP Student Project Lead: Nicoleta Buiciuc, MSN, APRN, FNP-BC, Jacksonville University, Phone number: 904-253-5168, email: nbuiciu@ju.edu

Faculty Chair: Kathryn Kott, Ph.D., APRN, FNP-C, Jacksonville University, phone (309) 634-6121, email: kkott@ju.edu

Project Statistician: Shiva Gautam Ph.D., Jacksonville University

PROJECT LEAD'S STATEMENT: We are asking you to be in a diabetes education project. The purpose of this consent letter is to give you the information you will need to help you decide whether to participate. Please read this form carefully. You may ask questions about the purpose of the project, the possible risks and benefits, and anything else about the project or this form that is not clear. When we have answered all your questions, you can decide if you want to be in the project or not. This process is called "informed consent." We will give you a copy of this form for your records.

THE PURPOSE OF THE PROJECT: The aim of the project is to find out if providing diabetes education prior to discharge from the hospital can help reduce readmissions to the hospital within 30 days. The project will also determine if diabetes education in the hospital will help you manage your diabetes better. Fifteen participants are expected to complete the project.

PROCEDURES: You will be asked to meet with the Student DNP Project Lead who will provide the diabetes education at hospital bedside. Your name will be coded by numbers and no identifying information will be associated with your name. The coding sheet will be stored separately from your data. You will be provided with a folder with the diabetes self-management handouts, resources and questionnaire. Before I provide diabetes education, you will be asked to fill out a questionnaire with 11 questions on how you take care of your diabetes at home. This will take approximately 7 minutes. After you complete the questionnaire, I will provide diabetes self-management education that will last approximately 30 minutes. I will collect the completed questionnaire and your phone number to follow up

with you 7 days after our first meeting. At this time, you will be asked to complete the same questionnaire. Your medical record will be followed for 30 days post discharge for readmission. Your data will not be linked to other data, research, protected health information, or administrative data.

About 15 adult participants will take part in the education project at the local organization.

If you decide to be in the project, the Student DNP Project Lead will collect the following information: number coded name, age, gender, race, diabetes medication taking, admission date, discharge date, phone number, questionnaire results pre/post education and if readmitted within 30 days of discharge. Information will be collected at the local organization on an excel spreadsheet.

I will not be using these de-identified data in future work.

If you have any questions now or at any time during the project, you may contact anyone listed under Project Leads.

BENEFITS OF THE PROJECT: You may benefit from being in this diabetes educational project because you will receive free diabetes self-management education. This diabetes education may help you increase your activity level, eat healthier, monitor your blood sugar levels better and be aware of reducing risks. Through these activities you can gain better control of your diabetes. Through the education, you may improve your diabetes self-management skills and behaviors. Others might benefit from the knowledge learned from the education project.

No promise or guarantee of benefits has been made to encourage your participation.

RISKS OF THE PROJECT: The risks of taking part in this project are breach of confidentiality. To minimize this risk, your data will be entered and stored in the secure database at the local organization within a protected password and encrypted server that is HIPAA compliant. All paper will be shredded once transferred into the computer. The project folder stored on the server is also password protected and can only be accessed by the project team. The paper copies of all consents will be stored in a locked filing cabinet at the local organization. Only the student Project Lead, JU Faculty Chair and JU Statistician will have access to the file. All data used during the project will be de-identified and made into aggregate data. The de-identified data will be shared with the local organization for quality improvement.

IN THE CASE OF INJURY OR ADVERSE EVENT: Please contact the Project Leads immediately, but also in the case of emergency please seek medical attention. Jacksonville University has not set aside funds for any medical costs, damages, or other financial loss from this project. The only exception is if it is proved that your injury or illness is directly caused by the negligence of a Jacksonville University employee. "Negligence" is the failure to follow a standard duty of care.

If you become ill or injured from being in this project, your insurer may be billed for your treatment costs. If you do not have insurance, or if your insurer does not pay, then you would have to pay these costs. If you believe you have become ill or injured from this project, you should contact Dr Kathryn Kott at 309-634-6121 (24-hour cell number). You should also let any healthcare provider who treats you know that you are in a project.



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COSTS / COMPENSATION: You will not have to pay for taking part in this project. You will not be paid to take part in this project. Your insurance will not be billed for the diabetes education provided. This project is paid for by the Project Student Lead. The diabetes education received will not replace what the local organization routinely provides.

ALTERNATIVE TO BE IN THE PROJECT: The alternative to taking part in this project is not to participate. You may choose to receive the standard education that is provided by the local organization for diabetes, which nursing provides.

CONFIDENTIALITY: Records or data obtained as a result of your participation may be reviewed by the Project Leads and/or The Jacksonville University's Institutional Review Board. However, they are legally obligated to protect any identifiable information from public disclosure, except where disclosure is otherwise required by law. These records will be kept private in so far as permitted by law. Also, other Jacksonville University officials have the legal right to review records, and they will protect the secrecy (confidentiality) of these records as much as the law allows. Otherwise, your records will not be released without your permission unless required by law or a court order. However, if we learn that you intend to harm yourself or others, we must report that to the authorities.

The Student Project Lead, Faculty Chair and Statistician plan to publish the results of this education project. To protect your privacy, we will not include any information that may identify you. To protect your privacy, we plan to store your confidential data in a secure database at the local organization with a protected password and encrypted server that is HIPAA compliant. All data files will be stored as password protected encrypted on a password protected computer that will be locked in an office at the local organization. All paper will be shredded once transferred into the computer. The paper copies of all consents will be stored in a locked filing cabinet at the local organization. Only the student Project Lead, JU Faculty Chair and JU Statistician will have access to the files. All data used during the project will be de-identified. Electronic data will be destroyed 3 years after the study is completed as required by Federal law.

The Project Leads listed may share the results from the diabetes education project with other professionals without asking for your consent again, but it will not contain information that could directly identify you. The findings from the education project will be used to write a paper. The paper will be sent to an electronic repository for other health care personnel to read. Other investigators, professionals, or students may use the findings in this paper for future studies.

To conduct this project, I would need access to your phone number and name to follow up on a 30-day readmission. I need the phone number to follow up with you 7 days after our first meeting. At that time, you will be asked to complete the same questionnaire. The information will be protected by the name coded numerically and there will be no identifying information associated with your name. The coding sheet will be stored separately from your data. We plan to store your confidential data in a secure database at the local organization with a protected password and encrypted server that is HIPAA compliant. All data files will be stored as password protected encrypted on a password protected computer that will be locked in an office at the local organization. All paper will be shredded once

transferred into the computer. The paper copies of all consents will be stored in a locked filing cabinet at the local organization. Only the student Project Lead, JU Faculty Chair and JU Statistician will have access to the files. All data used during the project will be de-identified. The results from the education project will not be included in the medical record or reported in any way.

CONFLICT OF INTEREST: The Project Leads may benefit if the results of the education project are presented at scientific meetings or published in scientific journals.

INSTITUTIONAL REVIEW BOARD (IRB):

INFORMED CONSENT Quality Improvement

RIGHT TO PARTICIPATE OR WITHDRAW: You are free to stop taking part in this project at any time without penalty and without losing any benefits. You will be provided, as applicable, with any significant new findings developed during this project that may relate to your participation.

If you decide to stop taking part in this project for any reason, you should contact Dr. Kathryn Kott (JU DNP Project Faculty Chair) at 309-634-6121. If you choose to tell the Project Lead why you are leaving, your reasons may be kept as part of the project record. If you decide to withdraw from the project, it may be impossible to exclude the data that has already been collected. In addition, Project Leads may retain and use data collected prior to your withdrawal, including Protected Personally Identifiable Information (PII), as long as the uses are consistent with the project purpose and procedures as described in the IRB application and consent documents. If you have any questions regarding your rights as a project participant, you may call the JU Office of Research & Sponsored Programs at (904) 256-7151.

You may be withdrawn from the project without your consent for the following reasons: You do not meet the eligibility criteria, become pregnant, admitted to the hospital, incarcerated, or unable to keep up with exercise, healthy eating, appointments, blood glucose monitoring or performing the tasks of the study.

CONSENT TO PARTICIPATE: I have been informed about this project's purpose, procedures, possible benefits, and risks; and the alternatives to being in the project. I have been given the opportunity to ask questions before I sign, and I have been told that I can ask other questions at any time. I understand that my consent does not take away any of my legal rights. I also understand that nothing in this consent form is intended to replace any applicable Federal, state, or local laws.

By signing this form, I voluntarily agree to take part in this project. I am not waiving any of my legal rights. I will receive a copy of this form.

Participant's Name Printed Participant's Signature Date

Person Obtaining Consent and Authorization:

Name Printed Signature Date

Appendix E

AADE7 Education Material Packet



AADE7 Self-Care Behaviors® HEALTHY EATING

Healthy Eating refers to a pattern of eating high quality, nutritionally dense foods in amounts that lead to better health and wellness. A healthy eating pattern contains a variety of colorful vegetables, fruits, whole grains, dairy, lean sources of protein and oils, while keeping salt, added sugars, saturated and trans fats to a minimum.

word
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TRACK YOUR FOOD

Everything you eat or drink can affect your blood glucose (sugar), blood pressure, blood lipids (such as cholesterol) and weight. So how do you make sense of all that? One way is by tracking what you eat, at least for a few days until you start to see patterns that help you decide what changes you might choose to make.

Use mobile apps, paper and pencil logs, or whatever works best for you. You can achieve your weight and wellness goals by finding the right balance of calories and other nutrients to meet your goals. Tracking to identify trends to help reduce your overall calorie intake is the best way to determine how to create that balance.

PARTNER WITH YOUR HEALTHCARE TEAM

You probably have lots of questions about making healthy food choices such as how to include favorite foods and drinks, eating out, preparing healthy meals and snacks, what to eat when exercising, travelling or at family events.

When it comes to healthy eating, no one eating pattern fits everyone. Work together with your diabetes care and education specialist and registered dietitian to come up with a plan that fits what you like and meets your health needs.



Cardiometabolic health:

Keeping your heart and blood vessels healthy and your prediabetes or diabetes well-managed.

Nutritionally dense foods:

Foods that have a large amount of vitamins and minerals in a relatively small quantity of food.

Carbohydrates (Carbs)

include starches, fibers and sugars. Found in milk, fruits/juices, vegetables, rice, grains, bread, beans/lentils, sugar and honey.

Proteins are made of amino acids which are the building blocks for repair and maintaining a healthy body. Found in milk, cheese, meats, poultry, fish, eggs, nuts and soy.

Fats: Concentrated energy source found in oils, nuts, spreads, olives, avocados, flax seed, peanut butter and salad dressings. Fat has twice as many calories per gram of food as compared to proteins and carbohydrates.

DIABETES CARE AND EDUCATION SPECIALISTS & REGISTERED DIETITIANS CAN HELP YOU:

- Set realistic, achievable healthy eating goals
- Review your food logs for trends and help you determine small changes that can help you meet your health goals
- Develop a meal plan that fits into your daily routine
- Learn about the right portions/serving sizes for you
- Understand how to use the nutrition facts label to make healthy choices
- Learn to count carbohydrates
- Learn about sources of salt and saturated fat in the foods you eat and small changes that can help you meet blood pressure or cholesterol goals
- Adjust meal plan for physical activity, holidays and travel
- Find apps for tracking or looking up food values



Question: Can people with diabetes eat sugar?

Answer: Yes, in moderation. Sugars are a type of carbohydrate counted as part of your total carbohydrate grams. Foods and drinks such as milk, fruit and starchy vegetables (like peas, corn and potatoes) that have natural sugars give you more than just calories. They contain nutrients that are healthier than chips or cookies. Added sugars are different and are listed under total sugars in the Nutrition Facts label. They include sugar that was added to the food during processing.

MAKING HEALTHY CHOICES: GETTING STARTED

EAT THESE FOODS MORE OFTEN		LIMIT THESE FOODS	
NONSTARCHY VEGETABLES	leafy greens, green beans, cucumbers, carrots, cauliflower, brussel sprouts and more.	ADDED SUGAR	candy, calorie containing drinks, baked goods and desserts.
LEAN PROTEIN	fish (salmon, tuna, cod, catfish, sardines, trout and others), chicken, turkey, eggs, nuts and soy foods	HIGH FAT MEATS	beef, skin from poultry, ribs, bacon, sausage, deli and processed meats like salami, bologna and hot dogs.
HEALTHY FATS	plant-based oils like vegetable, olive or canola.	FOODS HIGH IN SATURATED FAT	butter, lard, tropical oils (coconut, palm) ice cream and desserts.
FRUIT	small piece like apple, orange, peach or pear. small cup of berries.	SALTY SNACKS	potato chips, french fries, pickles, canned soups and table salt.



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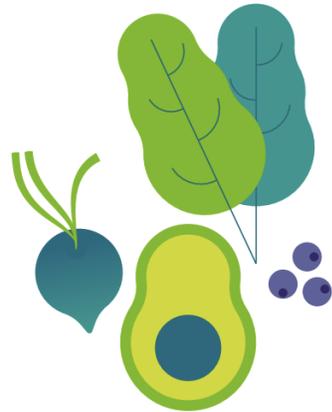
LEARN TO READ A NUTRITION FACTS LABEL

The Nutrition Facts label can help you make healthy eating and drinking decisions. Learn to read the food label to guide your choices by comparing similar foods and choices. Consult with your diabetes care and education specialist and your registered dietitian nutritionist for guidance.

Nutrition Facts	
8 servings per container	
Serving size	2/3 cup (55g)
Amount per serving	
Calories	230
% Daily Value*	
Total Fat 8g	10%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	13%
Dietary Fiber 4g	14%
Total Sugars 12g	
Includes 10g Added Sugars	20%
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 240mg	6%

This label shows that one serving is 2/3 cup. However, it has 8 servings per container. If you eat the whole container, you would have to multiply all the values by 8 to see the right totals for all the components.

The total carbohydrate amount takes into account the sugars and fiber. If you are carb counting, this is the number to pay attention to.



What you eat, how active you are and the medications you take work together to help you reach your diabetes care goals. Healthy eating has a big impact on your diabetes management and involves important skills, such as:

- measuring foods to get familiar with your portions
- determining the correct portions for you
- reading labels
- timing meals with medications
- being aware of or counting the carbohydrate foods you eat to better understand their impact on your blood glucose

Diabetes self-management education and support (DSMES) services teach these skills to their participants. Registered dietitian nutritionists also have this expertise and can help you. Ask your provider for a referral so that you can create your own personalized healthy eating plan to best manage your diabetes. You deserve it!

To learn how a diabetes care and education specialist can help you, visit DiabetesEducator.org/LivingWithDiabetes. For more on this and other behaviors for better diabetes management, visit DiabetesEducator.org/AADE7.



AADE7 Self-Care Behaviors® BEING ACTIVE

Being active means doing any type of daily physical movement, whether it's structured, like a session of exercise, or unstructured, like anything that decreases the time you spend sitting.

BE SAFE

You should be able to safely start doing any activity that takes about the same amount of effort as your usual activities without having to get a checkup first. However, if you are not used to a lot of activity, check with your healthcare provider to get medical clearance. They can advise you on medication adjustments that might be needed and let you know if you should avoid specific activities based on your condition.

FIT ACTIVITY INTO YOUR DAILY LIFE

When it's hard to find the time or motivation to start being active, choose the best ways to fit activity into your daily life—whether it's walking more, doing chair exercises or working out at the gym. Even getting up more often for short activity breaks or standing up longer helps rev up your metabolism. A diabetes care and education specialist can help you decide on an impactful routine that fits with your lifestyle and that you enjoy.



START WITH SMALL STEPS

Start by just moving more all day long, however you can. You can do an activity in multiple short sessions rather than one longer session. In time, you will find that you are feeling better and ready to go further.

word wall

Metabolism: The way that chemical processes in your body cause food to be used to give you energy. For example, if you don't eat breakfast, your metabolism slows down.

Fitness: Physical ability to carry out daily tasks with ample energy and without feeling worn out

Cardio: Continuous exercise that raises your heart rate (like walking or swimming)

Resistance training: Activities that help you build muscle and strength

Balance exercises: Activities that help you keep your balance and prevent falls

Stretching: Exercises to improve flexibility, reduce tightness and prevent injuries



PLAN IT OUT/MAKE IT HAPPEN

- Step 1:** Pick something you enjoy.
- Step 2:** Think about what might get in the way of you doing that activity.
- Step 3:** Brainstorm ways to start this week.
- Step 4:** Plan when to do it.
- Step 5:** Decide how long to do it.
- Step 6:** Know how hard you should be working when doing the activity. E.g. If you can talk but not sing during the activity, that is moderate intensity.
- Step 7:** Reward yourself at the end of the week for meeting your goals (and set new ones for next week).

BE CREATIVE

- Partner with a friend or family member to find creative ways to be more active.
- Take your dog for a walk or play at the park.
- Take the stairs instead of the elevator.
- Find a gym buddy to motivate you to show up.
- Build walking meetings into your work schedule.
- Participate in an activity challenge with a friend or co-worker.
- Call a friend to go dancing or put on your favorite song and dance at home.
- If you eat lunch with a co-worker, ask them to join you for a short walk after.
- Download a fitness app for guidance on creating your own exercise program.



Question: Is going to the gym or taking an exercise class the only way to be active?

Answer: No, there are so many ways to be active! Physical activity is anything that gets your body moving and helps you get fit and stay healthy.

Get Active for your Health

Being active has many benefits beyond fitness. Here are some of the ways being active improves your health and well-being:

- improves your muscle strength and heart health
- helps you lose inches and fat
- improves your cholesterol and blood pressure
- helps you feel less stressed or anxious, enhancing your mood
- adds years to your life
- keeps your blood glucose closer to healthy levels, preventing health issues now and in the future

To learn how a diabetes care and education specialist can help you, visit DiabetesEducator.org/LivingWithDiabetes.

For more on this and other behaviors for better diabetes management, visit DiabetesEducator.org/AADE7.

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AADE7 Self-Care Behaviors® MONITORING

Monitoring means checking your glucose (sugar) levels, activity and food intake, and gathering data from multiple sources and devices to make decisions about your diabetes prevention efforts or diabetes care and self-management.

Monitoring also involves your overall health, such as blood pressure, weight, cholesterol levels, heart health, sleep, mood, medications, and eye, kidney and foot health.

KNOW YOUR NUMBERS

For people with prediabetes or diabetes there are optimal target ranges to aim for in many areas of management. There are national guidelines to help put everything in perspective. Your provider and diabetes care and education specialist know that the best results occur when your care is geared to you and your individual needs. Ask them how your numbers compare to what is recommended for your optimal health.

CHOOSE A MONITORING DEVICE

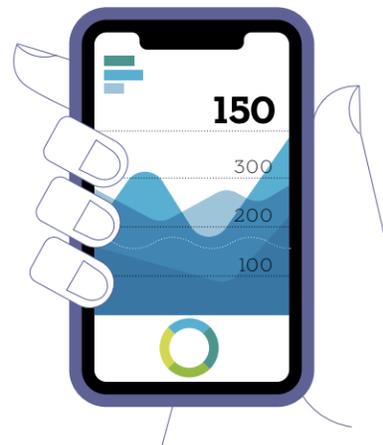
Monitoring devices provide “in the moment” data that helps you determine how well your diabetes management plan is working. Ask your diabetes care and education specialist to help you choose a monitoring device. They will personalize and advise you based on your values and preferences, helping you to compare and contrast the pros and cons of each. Here are some of the ways they can help you:

- Determine which diabetes management device you can afford and works best for you.
- Learn how and when to use the device to track your data.
- Figure out how to find patterns you can act on.
- Come up with an ongoing plan for monitoring as your health goals are met.



Question: Can you tell what your glucose level is by the way you feel?

Answer: You may have symptoms of high or low glucose, but your symptoms may disappear or change over time, so it's always best to check.



FIND THE PATTERNS THAT TELL THE STORY

Taking multiple measurements and putting them together to identify patterns is much more meaningful than looking at numbers one at a time. Once you and your diabetes care and education specialist work together to highlight the patterns, you can begin to identify the cause and effect of the patterns and take needed action.

Examples of patterns you might see:

- Your glucose is higher after dinner on most days
- Whenever you eat at bedtime, your glucose tends to be high the next morning
- If you take a walk for at least 20 minutes, your glucose goes down to a better level.
- Your blood pressure is higher in the morning than the evening.

Tracking and organizing data such as food intake, activity, blood pressure, stress levels and glucose can help you see the story the data is telling. There are many easy ways to track data, including paper logs, an app on your smartphone or software program that comes with your device. Focusing on the patterns rather than every single reading also helps to keep your emotions more level.

Reach out to your diabetes care and education specialist to understand how to read the reports for the devices you are using and what patterns to look for. Many of these reports are designed to present useful patterns to the user.



word wall

Blood Glucose Meter: A small device that is used to check glucose levels in the blood. It uses test strips and a fingerstick device.

Continuous Glucose Monitor (CGM): A system with multiple parts that is worn continuously and senses glucose levels every few minutes in the fluid around the body cell, sending the readings to a reader, receiver or app on a phone. The readings are shown in graph form with trend arrows showing if the glucose levels are staying the same, dropping or going up.

A1C: A test that reflects your average blood glucose level during the past 3 months.

Time in Range (TIR): When using a CGM, TIR is the percentage (%) of time your glucose is between 70mg/dl and 180 mg/dl. These numbers represent the highest and lowest your glucose levels can be before they become a concern.

TIPS FOR MONITORING GLUCOSE:

If you're using a fingerstick meter, wash your hands with soap and water, and dry them thoroughly before checking. Substances on your skin (like dirt, food or lotion) can cause inaccurate results. If you are wearing a continuous glucose monitor, follow the manufacturer's information on the best ways to keep it working well for you.

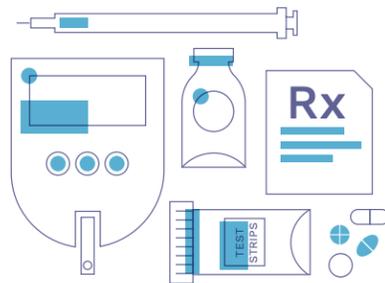
- The best time to check the effect of your meal on your glucose level is 2 hours after eating.
- Contact your diabetes care team if you are having glucose readings below 70mg/dl. You may need your medication dose adjusted or need help with problem solving to find the reason.
- Check your glucose levels more often if you think you're getting sick and during any illness.
- Bring your glucose record or download report to every appointment with your care team.
- When traveling, keep your supplies in the package with the original prescription in your carry-on luggage. If needed, advise security personnel that you are carrying diabetes supplies.



INCLUDE MONITORING IN YOUR SELF-CARE

Monitoring helps you know if you are meeting recommended treatment goals to keep you healthy. When you self-monitor, you get the information you need to make food and activity adjustments and manage your medications so that your body can perform at its best. The numbers you get when you monitor are useful to help your care team match treatment to your needs. You'll start to recognize patterns that lead to enhanced self-care, giving you a well-deserved sense of accomplishment.

A diabetes care and education specialist can be a great resource to help you choose the right monitoring device, and one you can afford. They will work with you on how to use the device correctly and understand the results. Together, you will collaborate to stay on track and make progress by setting small, measurable goals. Ask your provider to refer you. You deserve it!



To learn how a diabetes care and education specialist can help you, visit DiabetesEducator.org/LivingWithDiabetes.

For more on this and other behaviors for better diabetes management, visit DiabetesEducator.org/AADE7.



AADE7 Self-Care Behaviors® REDUCING RISKS

Reducing risks means doing behaviors that minimize or prevent complications and negative outcomes of prediabetes and diabetes.

Examples of these behaviors are making positive lifestyle changes, participating in a type 2 diabetes prevention or diabetes self-management education and support program, getting adequate sleep, and getting the recommended vaccines and health screenings. Reducing risks means you need to acknowledge that preventive actions you do now will benefit you years from now and that you have the power to change your health outcomes.

LEARN ABOUT YOUR RISKS

Talk to your diabetes care and education specialist and healthcare provider about health risks such as kidney damage, nerve damage and vision loss. They can explain why complications happen and how they can be avoided. You can develop the self-management skills needed to support and maintain a healthy lifestyle by meeting with your diabetes care and education specialist.

THE FOUR CRITICAL TIMES TO SEE A DIABETES CARE AND EDUCATION SPECIALIST

When you are first diagnosed with diabetes	At least once a year
When you experience changes that affect your self-management such as financial or emotional distress	When you have changes in your provider, insurance or living situation.



Question: What kinds of health checks give you the best chance of keeping your heart healthy and avoiding short and long-term complications?

Answer: Research has shown that managing your glucose (sugar), blood pressure and cholesterol levels, getting regular oral health checks, eye checks, kidney checks and taking care of your feet all lead to less chance of developing complications or of existing complications getting worse

CHECKLIST

- GLUCOSE
- CHOLESTEROL
- EYES
- KIDNEYS
- BLOOD PRESSURE
- ORAL HEALTH
- FEET



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REDUCE YOUR RISK OF COMPLICATIONS

Schedule regular medical checkups



Get screened for sleep apnea

Get screened for hearing loss



Follow your healthy eating plan

Commit to moving more and sitting less



Take medications as prescribed

Monitor your glucose using CGM or blood glucose meters



Don't smoke or vape



Brush and floss your teeth daily

Get a flu shot



Get pneumonia and hepatitis B vaccinations

Discuss any sadness or distress with your provider

Check your feet daily for redness, sores, open wounds



Get Help When You Need It

Do you find prediabetes or diabetes too hard to handle? Do you often feel overwhelmed or sad?

Your diabetes care and education specialist or mental health expert can help. Tell them about your feelings, especially if you:

- Struggle to manage your diabetes
- Have negative thoughts
- Avoid seeing your healthcare providers
- Have little interest or don't find pleasure in your activities
- Sleep most of the day or are not able to sleep
- Have lost your appetite or are overeating
- Feel others in your family don't care

word wall

Short-term complications

These are when you experience high or low glucose (sugar) levels that put you at risk of passing out or being hospitalized.

Long-term complications

These can happen after many years and include heart attacks, strokes, decreased vision or blindness, decreased kidney function, numbness or tingling in your hands or feet, slowing down of stomach emptying, foot deformities, sexual problems and skin problems.

TYPE OF HEALTH CHECK	FREQUENCY
A1C (a blood test that measures your average blood glucose level during the past 3 months)	Every 3 to 6 months
Blood pressure	Every visit
Lipids (blood fats) HDL (good cholesterol) LDL (bad cholesterol) Triglycerides (blood fats that come from food and are made by the body)	At least every year
Eye checkup	Every year
Kidney function tests	Every year
Dental checkup	At least every year
Foot checkup (for nerve function and blood flow)	At least every year

BREAK TASKS INTO SMALLER PARTS

Your diabetes care and education specialist can help you with planning and scheduling recommended health checks. This task can be less overwhelming when you divide them up into smaller, doable tasks. Make a list of tasks and decisions, then work on them one at a time until you have completed the list. Here is a sample task list for getting an annual eye exam:

- Find out insurance coverage and cost for the eye exam.
- Identify eye providers in your network and select one.
- Call and schedule the appointment.
- Make arrangements to allow time for the appointment.
- Actively participate in the appointment.

Making sure you get recommended health checks and sticking to your treatment plan are positive steps you can take to reduce your risk of complications. Taking an active role in keeping your heart, kidneys and eyes as healthy as possible helps you achieve your desired quality of life. Act early so you can stay healthy in the long run! A diabetes care and education specialist can be a great resource for helping you understand how to reduce your risks. Ask your provider to refer you. You deserve it!

To learn how a diabetes care and education specialist can help you, visit DiabetesEducator.org/LivingWithDiabetes. For more on this and other behaviors for better diabetes management, visit DiabetesEducator.org/AADE7.



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Appendix F

Permission to use AADE7 Education Handouts



Reducing Risks

Having diabetes puts you at a higher risk for developing other health problems. However, if you understand the risks, you can take steps now to lower your chance of diabetes-related complications.

[Read More](#)

Healthy Coping

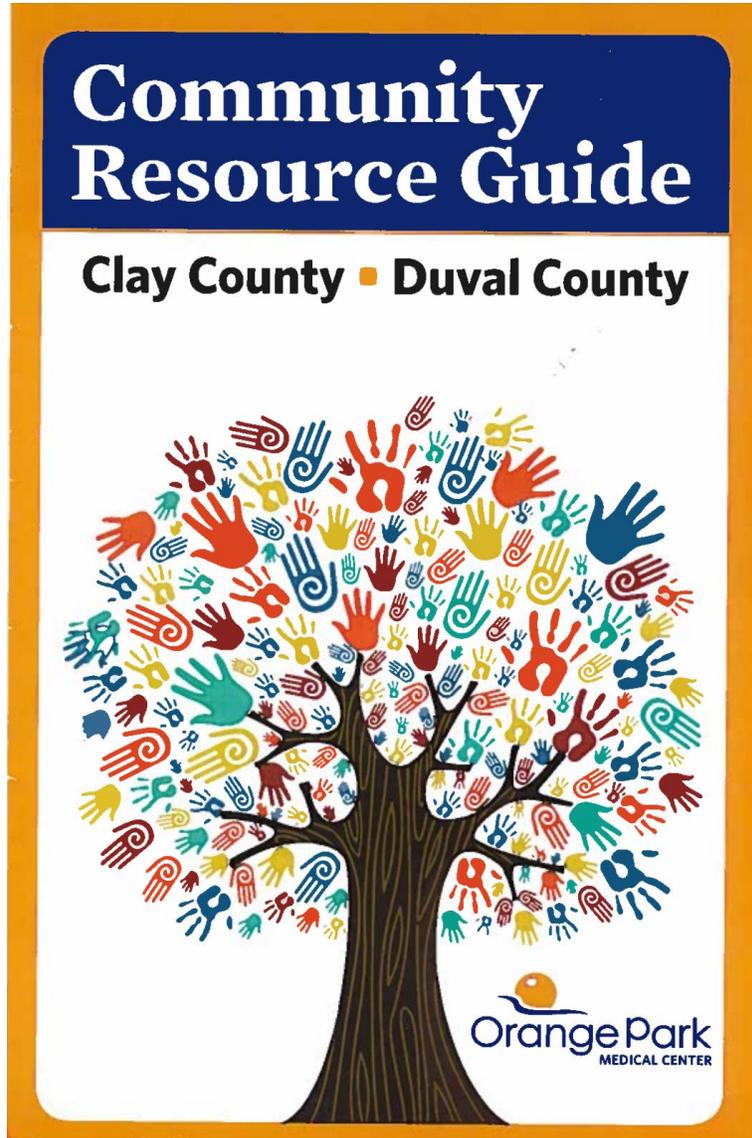
Diabetes can affect you physically and emotionally. It's natural to have mixed feelings about your diabetes management and experience highs and lows. The important thing is to recognize these emotions as normal and take steps to reduce the negative impact they can have on your self-care.

[Read More](#)

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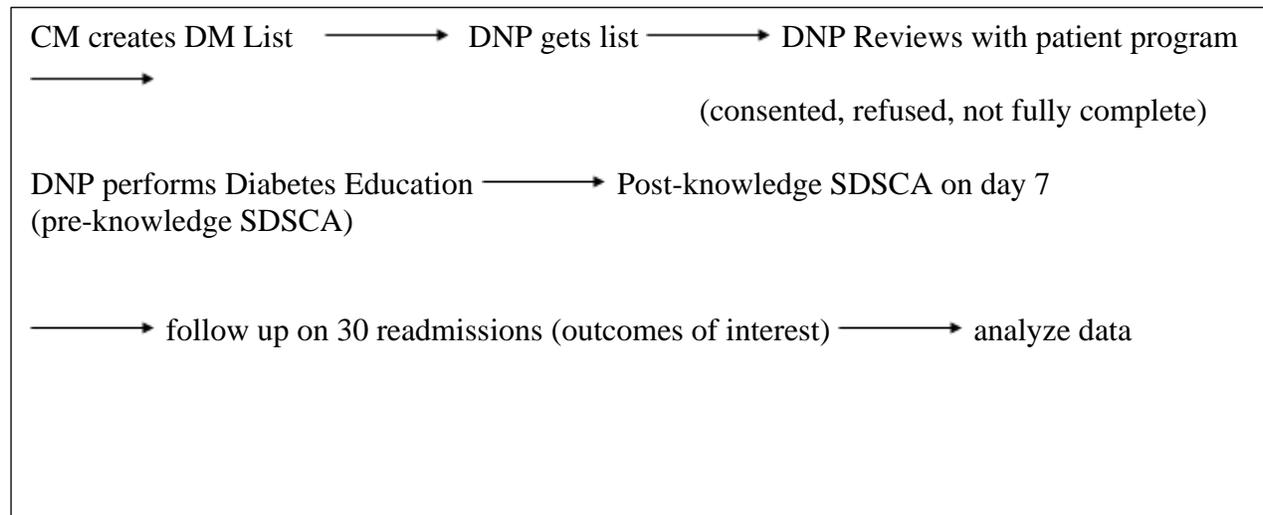
Appendix G

Resources



Appendix H

Project Design Process



Appendix I

Project Financial Costs

Item	Cost
Printing AADE7 Handouts	\$36.00
Printing Consent Forms	\$20.00
Permission to use SDSCA	\$25.00
Printing SDSCA questionnaires	\$6.00
Purchase of 15 folders	\$15.00
Total Costs	\$102.00