

QUALITY IMPROVEMENT INITIATIVE TO INCREASE THE NUMBER OF REFERRALS  
TO DIABETES EDUCATION

by

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## Abstract

Diabetes is a nationwide health concern and the seventh leading cause of death in the United States. The disease and its complications negatively impact the health of the patients and increase health care costs. As a chronic disease, diabetes requires self-care on a daily basis, including lifestyle behaviors, medication adherence, and metabolic control. However, patients often failed an effective management of their conditions, which highlighted the need of diabetes self-management education and diabetes self-management support. A current evidence suggests the effectiveness of diabetes self-management education and support on improving clinical outcomes of diabetic patients. However, a literature review shows that providers do not always refer patients because they do not acknowledge the efficacy of diabetes education or they are not aware of available resources. The purpose of this quality improvement project was to increase the number of patient referrals to diabetes education. The project was implemented at private non-profit clinic in Eastern North Carolina. The participants of the project were four primary care providers and one health coach. During an implementation phase, an educational session regarding the importance of diabetes education was provided and educational material was distributed to the providers and the health coach. Pre-implementation (4-weeks period), out of 144 patients seen by providers six patients were referred to diabetes education that corresponded to four percent. Post-implementation (6-weeks period), out of 245 patients seen by providers 17 patients were referred to diabetes education that corresponded to seven percent. After analyzing data, it had been concluded that there was a small increase in referrals post-implementation.

*Key words: diabetes self-management education, diabetes self-management support*

## Table of Contents

Acknowledgments.....	2
Abstract.....	3
Chapter One: Overview of the Problem of Interest .....	8
Background Information.....	8
Significance of Clinical Problem .....	10
Question Guiding Inquiry (PICO) .....	17
Population .....	17
Intervention .....	17
Comparison.....	17
Outcome(s).....	18
Summary.....	18
Chapter Two: Review of the Literature Evidence .....	20
Methodology .....	20
Sampling strategies .....	20
Evaluation criteria.....	22
Literature Review Findings.....	22
Limitations of Literature Review Process.....	25
Discussion.....	28
Conclusions of findings .....	30
Advantages and disadvantages of findings.....	31
Utilization of findings in practice .....	32
Summary.....	33

Chapter Three: Theory and Concept Model for Evidence-based Practice .....	33
Concept Analysis .....	34
Theoretical Framework.....	36
Application to practice change.....	36
Evidence-Based Practice Change Theory .....	37
Application to practice change.....	37
Summary .....	38
Chapter Four: Pre-implementation Plan .....	39
Project Purpose .....	39
Project Management .....	39
Organizational readiness for change.....	39
Inter-professional collaboration .....	41
Risk management assessment.....	42
Organizational approval process.....	43
Information technology.....	43
Cost Analysis of Materials Needed for Project.....	44
Plans for Institutional Review Board Approval.....	44
Plan for Project Evaluation .....	44
Demographics .....	45
Outcome measurement.....	45
Evaluation tool .....	45
Data analysis .....	46
Data management.....	46

Summary .....	46
Chapter Five: Implementation Process .....	47
Setting .....	47
Participants.....	47
Recruitment.....	48
Implementation Process .....	48
Plan Variation .....	50
Summary .....	50
Chapter Six: Evaluation of the Practice Change Initiative .....	50
Participant Demographics.....	50
Intended Outcome(s).....	51
Findings.....	51
Summary .....	51
Chapter Seven: Implications for Nursing Practice.....	52
Practice Implications.....	52
Essential I: Scientific underpinnings for practice .....	52
Essential II: Organization and systems leadership for quality improvement and systems thinking .....	53
Essential III: Clinical scholarship and analytical methods for EBP .....	54
Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare.....	54
Essential V: Healthcare policy for advocacy in healthcare .....	55
Essential VI: Interprofessional collaboration for improving patient and population health outcomes.....	56
Essential VII: Clinical prevention and population health for	

improving the nation’s health .....	56
Essential VIII: Advanced nursing practice .....	57
Summary .....	58
Chapter Eight: Final Conclusions .....	58
Significance of Findings .....	59
Project Strengths and Limitations .....	59
Project Benefits .....	60
Recommendations for Practice .....	61
Final Summary .....	61
References .....	63
Appendix A: Evidence Matrix .....	69
Appendix B: A Computer Card .....	104
Appendix C: Diabetes Self-Management Education and Support Algorithm .....	105
Appendix D: Organizational Letter of Support .....	106
Appendix E: Cost of Materials Needed for the Project .....	107
Appendix F: Data Collection Tool .....	108
Appendix G: Qualtrics Survey .....	109
Appendix H: Referral Rate .....	113

## Chapter One: Overview of the Problem of Interest

Diabetes is a worldwide epidemic and one of the most challenging health problems today (Schinckus, Broucke, & Housiaux, 2014). In 2011, the number of people living with diabetes was estimated at 366 million worldwide. By 2030, the number of the patients with diabetes is expected to rise to 552 million (Schinckus, et al., 2014). Diabetes care takes up between five and 15 percent of total health expenditure, depending on the country (Schinckus et al., 2014). Diabetes is the fifth leading cause of death in high-income countries and is becoming epidemic in developing countries. Diabetes is a nationwide health concern and the seventh leading cause of death in the United States (Mays, 2015). The purpose of this chapter is to identify strategies allowing to decrease a heavy burden associated with diabetes and its complications on the US health care system, including primary care settings.

### Background Information

Diabetes mellitus includes type 1, type 2, and gestational diabetes (Mays, 2015). Type 1 diabetes mellitus (T1DM) is one of the most common chronic diseases in childhood and adolescence (Pillay et al., 2015). Type 2 diabetes mellitus (T2DM) results from insulin resistance, related to genetic influence, aging, sedentary lifestyle, poor diet, and obesity (Schinckus, et al., 2014). Gestational diabetes causes complications in five to nine percent of pregnancies in American women and leads to an increase in risk for developing type 2 diabetes. In addition, gestational diabetes is detrimental for babies and is related to risk for obesity and type 2 diabetes in children (Jones, Yan, Colditz, & Herrick, 2018).

**Prevalence.** Type 2 diabetes mellitus (T2DM) makes up roughly 95 percent of all diabetes cases (Schinckus et al., 2014). According to the data from the Centers for Disease Control and Prevention, in 2011, approximately 10 percent of the US population had type 2



diabetes (Rosa, Lapides, Hayden, & Santangelo, 2014). In 2012, 23.1 million adults have been diagnosed with diabetes and 7.2 million people were believed to be living with undiagnosed diabetes, which costed \$245 billion and represented 11% of the total the U.S. health care expenditure (Pillay et al., 2015). At the same time, 84.1 million adults had prediabetes. Thus, more than 114 million Americans were at risk for developing diabetes-related complications (Beck et al., 2017). Type 1 diabetes mellitus is also increasing in prevalence in the United States (Pillay et al., 2015). Gestational diabetes prevalence increases with age, body mass index, non-Caucasian race, and lower socioeconomic status (Jones et al., 2018).

Approximately 1,075,855 people in North Carolina, or 13.1 percent of the adult population, have diabetes. In addition, 2,624,000 people in North Carolina, 36.1 percent of the adult population, have prediabetes with blood glucose levels higher than normal, but not yet high enough to be diagnosed as diabetes. Every year an estimated 53,000 people in North Carolina are diagnosed with diabetes. Diabetes and prediabetes cost is estimated to be \$10.9 billion in North Carolina each year (American Diabetes Association, 2018).

**Severity of consequences.** The type 2 diabetes is a major cause of increasing incidence of morbidity, disability, and mortality secondary to its complications. Approximately one in three American adults are projected to have diabetes in 2050 if present trends continue. A current trend will exceed the level of the costs of care that the US health care system may afford unless incidence rates and diabetes-related complications are reduced (Power et al., 2015). The diabetes epidemic is becoming a subject to significant financial expenditures and incredible burden on the health care system and, in particular, on primary care settings (Chomko, Odegard, & Evert, 2016). Diabetes-related complications include hypertension, dyslipidemia, myocardial infarction, stroke, kidney disease, blindness, lower limb amputation, and blindness (Beck et al., 2017).

## **Significance of Clinical Problem**

Diabetes is a complex and burdensome chronic condition and remains an ongoing health care concern (Pillay et al., 2015). Levels of morbidity and mortality attributable to diabetes remain high and cost related to diabetes are also high and continue to rise (Leopard, Joseph, Agne, & Cherrington, 2015).

**Diabetes self-management education (DS-ME).** As a chronic disease, diabetes requires self-care on a daily basis, including lifestyle behaviors, medication adherence, and metabolic control. Patients have often failed an effective management of their health conditions, which highlighted the need of diabetes self-management education (DS-ME) and diabetes self-management support (DS-MS) (Brown et al., 2016).

**Definition.** Diabetes self-management education (DS-ME) is a collaborative process through which diabetes educators provide patients with diabetes knowledge, teaches them lifestyle behaviors, and trains them in problem-solving and decision-making skills for engaging them in self-managing practices (Chomko et al., 2016). Patients should be aware of suitable self-care behaviors, including healthy eating, being physical active, medication adhering, and monitoring health data, and healthy coping with physical and psychological issues and concerns (Pillay et al., 2015). Patients with diabetes need DS-MES when diabetes is diagnosed for the first time, annually for an educational needs' assessment, and when new issues or transitions in care occur (Levesque, 2017). At diagnosis providers answer questions and provide emotional support to their patients, educate their patients regarding treatment and treatment goals, teach them survival skills to address immediate concerns, identify and discuss resources for education and support, and make referrals for DS-MES and MNT. During an annual assessment of education, nutrition, and emotional needs, providers assess all areas of self-management, review problem

solving skills, and identify strengths and challenges of living with diabetes. When new complicating factors arise, providers identify presence of factors that influence diabetes self-management, discuss effect of complications, and assist in developing treatment goals. When transitions in care occur, providers develop diabetes transition plan, communicate this plan to a new health care team, and begin DS-MES regular follow-up (Mick, 2016). Patients should be aware of activities suitable to their self-care needs for ongoing support of their education (Powers et al., 2015). Diabetes self-management support (DS-MS) is the use of suitable resources for sustaining patients' knowledge, skills, and behavioral changes at the level needed for optimal diabetes control (Brown et al., 2016). Diabetes self-management education and support (DS-MES) should be individualized to match patients' age, medical history, health beliefs, and health literacy; current diabetes knowledge, perception of diabetes and its risks; and diabetes self-management behaviors and skills. DS-MES should be also tailored to physical, emotional, and psychosocial needs, personal preferences and priorities, social support, financial status, and physical limitations. All these factors impact patients' ability to cope with their condition and choose their own course of action and strategies to deal with challenges of diabetes self-management (Beck et al., 2017). DS-MES is a critical element of care for patients with diabetes, decreasing the growing of diabetes incidence and diabetes-related complications, reducing diabetes-associated health care costs, and improving diabetes clinical outcomes in the primary care settings (Pillay et al., 2015). The National Standards for DS-MES provide evidence-based, patient-centered, culturally relevant, cost-effective educational approach to diabetes self-management, serving as a guidance for diabetes self-management educators (Beck et al., 2017).

***Provider provision.*** Initial DS-ME is typically conducted by health care providers in primary care settings whereas DS-MS, aimed at sustaining patients' knowledge, skills, and behaviors, may be conducted within community-based resources on an ongoing basis (Powers et al., 2015). During routine medical visits, primary care providers may identify factors that influence the clinical, behavioral, and psychological aspects of diabetes self-management. These factors include the patients' ability to manage basic living needs, such as food security, adequate housing, safe environment, and access to medications, and to cope with physical limitations (Beck et al., 2017).

Communication strategies include culturally relevant information about available resources and motivational interviewing to engage patients in informed decision-making and personal problem-solving. Health care providers should monitor patients' achievement of their clinical, psychological, and behavioral goals, evaluate the effectiveness of the educational interventions, and track evidence-based outcomes (Beck et al., 2017).

Health care providers may be a primary source of DS-ME. However, the effectiveness of DS-ME in primary care settings may be limited due to the time available for DS-ME, the levels of providers' diabetes knowledge and their communication skills, and patients' ability to perceive and retain information during short appointments. Thus, health care providers in primary care settings do not have an opportunity to address all diabetes self-care needs and diabetes-related complications or comorbidities during diabetes visits, which necessitates additional education (Chomko et al., 2016).

***Resources.*** Primary care providers should have available adequate resources and put into their daily practice a systemic referral process to ensure patients with continuing DS-MES in a consistent manner within alternative settings (Powers et al., 2015). A referral should include the

type of diabetes, treatment plan, and reason for referring. The feedback on the performance of the DS-MES to referring providers helps evaluate the effectiveness of DS-MES (Beck et al., 2017).

DS-MES delivered through the use of community-based resources on an ongoing basis engages patients in lifelong learning. Diabetes paraprofessionals, such as trained community health workers or social workers can sustain positive behavioral changes, reinforce self-management skills, and sustain benefits achieved from DS-ME (Powers et al., 2015).

Receiving DS-MES in convenient and alternative settings and through technology-based programs increases access to diabetes care (Powers et al., 2015). Patients should be aware of resources available for ongoing support of their education (Beck et al., 2017).

***Course content.*** Health care providers (HCPs) should refer patients with diabetes to DS-ME courses to provide them with diabetes evidence-based information related to self-care, thereby saving time for an assessment and treatment in primary care settings. HCPs should encourage patients to attend and be responsive for those who are not eligible to attend. They should identify factors improving the content and uptake of DS-ME and benefits of educational programs (Winkley et al., 2018).

Ongoing self-management education and support should be provided in a flexible curriculum with the wide range of options for delivery due to technology-based programs and interactive teaching styles (Beck et al., 2017). In accordance with National Standards, the majority of DS-ME programs have a written curriculum, a critical component of diabetes education that should be a part of every DS-ME program (Martin, Warren, & Lipman, 2013). Counseling/education varies in curriculum form and content, group size, classes durations, and session number and length (Azar et al., 2015).

Goal setting and action planning of curriculum of educational programs embrace a wide range of diabetes self-management and support issues, such as diabetes-specific knowledge, meal planning, physical activity, medication usage, risk reduction, self-monitoring, management of complications, and treatment of side effects (Wong et al., 2014). Collaborative goal-setting and motivational support are more likely to be associated with positive outcomes, such as improving metabolic control, a strong predictor of diabetes progression and development of micro- and macrovascular complications, than purely educational interventions (Lepard et al., 2015). The course of curriculum includes also physical, psychological, and social issues with emphasizing the topics of self-management of blood glucose and weight loss throughout the class series (Chomko et al., 2016).

Group-based sessions, including different media, may be utilized if traditional education services are insufficiently flexible to meet patients' needs. Effective program should include from six to 10 sessions with a minimum of 12 hours (Speight & Deakin, 2016). The length of each session, either group or individual counseling, takes 60 to 90 minutes (Azar et al., 2015).

Group mode of delivery provides interactions between patients with diabetes, which enables them to learn from one another and share their knowledge and experience (Winkley et al., 2018). The varying success of interventions, including support groups can be associated with inconsistent attendance for patients requiring travelling to a support-group meeting location. This may be also related to the fact that interventions rely primarily on educational sessions that are less effective than continuous access to supportive resources (Lepard et al., 2015).

Patients with diabetes can use other sources in addition to formal DS-ME, which will give flexibility in choosing DS-ME venues that suit their schedules, learning styles, educational level, and sociodemographic characteristics. They may receive DS-ME from various sources,

such as discussions, online courses, and self-directed internet searches outcomes (Wu, Davis-Ajami, Noxon, & Lu, 2017).

***Certified Diabetes Educators (CDEs).*** Certified diabetes educators, as trained specialists, adapting educational strategies to patients' characteristics, are the most effective source of DS-MES (Wu et al., 2017). CDEs provide education and counseling for patients between patients' visits to their primary care providers to support their self-management skills (Chomko et al., 2016). They also provide information about available resources and address basic living needs and medical conditions with a focus on appropriate medications, healthy eating, and physical activity to maximize clinical outcomes and improve the quality life (Power et al., 2015).

A personalized and contextualized approach to educational and clinical diabetes care requires the development of self-management plan adapted for patients' demographic and sociocultural characteristics and type and stage of diabetes. CDEs collaborate with patients to build an individual self-management plan based on patients' physical, psychological, and social needs for addressing specific self-care challenges, which necessitates the use of additional educational resources. They communicate patients' revised plan of interventions to the referring primary care providers (Power et al., 2015).

***Barriers to DS-ME.*** Despite referrals to DS-MES, some patients with diabetes are unable or unwilling to attend diabetes education programs. Factors influencing uptake of education include both educational issues and patient-level problems. Educational issues are related to program content, integration of education management plan into ongoing diabetes care, and communicating the benefits to patients. Patient-level problems are associated with access to educational programs, attendance at more localized and targeted education, and the appropriateness of the program for certain groups (Winkley et al., 2018).

Access and attendance issues are the most common factors limiting uptake of DS-ME. They include inadequate idea of diabetes and its complications and unawareness of the actual content of educational program and, also, elderly age, disability, mental health problems, literacy and learning difficulties, and cultural issues. A lack of local skilled DS-MES providers in primary care settings, inaccessibility of diabetes education programs, difficulty acquiring transportation or lack of funds to pay for gasoline, parking, or highway tolls, travel cost, and lack of health insurance may be barriers to receiving DS-MES as well (Speight & Deakin, 2016). Inflexible work schedule and being busy with young children contribute to this problem (Winkley et al., 2018).

***Addressing barriers to DS-ME.*** Local primary care settings staff can be trained by CDEs to translate diabetes education programs in primary care clinics. Using train-the-trainer model and utilizing staff, such as registered nurses, nutritionists, pharmacists, and social workers are an effective strategy. The provision of diabetes education by trained educators within local primary care settings reduces patient travel time and cost (Chomko et al., 2016). The use of convenient and alternative settings through technology-based programs increases access to DS-MES (Powers et al., 2015).

***Risk factors, symptoms: Type 2 DM.*** Patients should comprehend the risk factors for diabetes, such as obesity, high blood pressure, low HDL and high triglycerides, a family history of diabetes, or belonging to ethnic or minority group. Patients living with diabetes should be taught about avoidance of smoking and educated regarding foot care to prevent diabetic foot ulcers. Patients must also have an idea about symptoms of T2DM, such as excessive thirst or hunger, extreme fatigue, frequent urination, blurred vision, numbness or tingling in the hands or



feet, recurrent skin, gum, bladder, or vaginal infections, not healing wounds, and sudden, unexplained loss of weight (Mays, 2015).

### **Question Guiding Inquiry (PICO)**

**Population.** The population was four providers: three Medical Doctors (MDs), one Doctor of Osteopathic Medicine, and one Health Coach who were working at a primary care clinic in Eastern North Carolina. Among MDs, the first one was specialized in primary and geriatric care, the second one in primary care, and the third one in family medicine. The providers had a low rate of the patients' referrals to diabetes education. This situation was improving with hiring a health coach to the clinic.

**Intervention.** The intended intervention was to educate providers and health coach about Diabetes Self-Management Education (DS-ME) importance along with providing them with Diabetes Self-management Education and Support Algorithm and a computer card. A PowerPoint presentation was created with a goal of educating the providers and health coach about benefits of DS-ME that included reduced hospitalizations, lower health care costs, and improved quality of life among patients. The providers learned that patients' engagement in diabetes classes had improved A1C by 0.6 percent (comparable to many diabetes medications), but had posed no side effects (Beck et al., 2017). Diabetes Self-management Education and Support Algorithm emphasized four critical times to assess, provide, and adjust diabetes self-management education and support: at diagnosis, annually, when new complicating factors arose, and when transitions in care occurred. A computer card reminded providers and health coach to refer the patients to diabetes education.

**Comparison.** The number of the patients' referrals to diabetes education was evaluated before and after the intervention. The project was implemented during six weeks and the number

of patients' referrals in that time was compared with the number of patients 'referrals pre implementation.

**Outcome.** To increase the number of the patients' referrals to diabetes education a PowerPoint presentation in a front of providers, health coach, and practice manager was performed and Diabetes Self-management Education and Support Algorithm and a computer cards were provided to them.

### **Summary**

Diabetes is a worldwide epidemic that is the fifth leading cause of death in high-income countries and a nationwide health concern and the seventh leading cause of death in the United States. Levels of morbidity and mortality attributable to diabetes remain high and cost related to diabetes continues to rise. The type 2 diabetes is a major cause of increasing incidence of morbidity, disability, and mortality secondary to its complications, such as hypertension, dyslipidemia, myocardial infarction, stroke, kidney disease, blindness, lower limb amputation, and blindness. A current trend will exceed the level of the costs of care that the US health care system may afford unless incidence rates and diabetes-related complications are reduced.

As a chronic disease, diabetes requires self-care on a daily basis, including lifestyle behaviors, medication adherence, and metabolic control. Patients living with diabetes need diabetes self-management education (DS-ME) and diabetes self-management support (DS-MS).

DS-ME is a collaborative process through which diabetes educators provide patients with diabetes knowledge, teaches them lifestyle behaviors, and trains them in problem-solving and decision-making skills for engaging them in self-managing practices. DS-MS is the use of suitable resources for sustaining patients' knowledge, skills, and behavioral changes at the level needed for optimal diabetes control. Initial DS-ME is typically conducted by health care

providers in primary care settings, whereas DS-MS may be conducted within community-based resources on an ongoing basis in a flexible curriculum with the wide range of options for delivery. The effectiveness of DS-ME in primary care settings is limited by the time available for DS-ME, the levels of health care providers' diabetes knowledge and their communication skills, and patients' ability to perceive and retain information during short appointments, which necessitates additional education.

Primary care providers should put into their daily practice a systemic referral process to ensure patients will have continuing DS-MES in a consistent manner within alternative settings. A referral should include the type of diabetes, treatment plan, and reason for referring. The feedback on the performance of the DS-MES to referring providers helps evaluate the effectiveness of DS-MES.

Certified diabetes educators, adapting educational strategies to patients' characteristics, are the most effective source of DS-MES. They communicate patients' revised plan of interventions to the referring primary care providers. Using train-the-trainer model and utilizing staff, such as registered nurses, nutritionists, pharmacists, and social workers are an effective strategy sustaining benefits achieved from DS-ME. Receiving DS-MES in convenient and alternative settings and using other sources suitable to their personal needs, increases access to diabetes care.

Factors influencing uptake of education include both educational issues and patient-level problems. Access and attendance issues are the most common factors, limiting uptake of DS-ME. Local primary care settings staff can translate diabetes education programs in primary care settings. The use of convenient and alternative settings through technology-based programs increases access to DS-MES.

The National Standards for DS-MES provide evidence-based, patient-centered, culturally relevant, cost-effective educational approach to diabetes self-management and serve as a guidance for diabetes self-management educators.

Diabetes is a complex, chronic condition that requires patients to make informed decisions, solve daily life problems, and adhere to self-care lifestyle behaviors. Ongoing self-management education and support are implemented in up-to-date and flexible curriculum with technology-based programs incorporated into health care. DS-MES should be individualized and tailored to match patients' age, medical history; health beliefs and health literacy. The National Standards for DS-MES provide evidence for all diabetes self-management educators. The Standards help patients with diabetes to learn problem-solving and decision-making skills for ongoing self-management, have better relationships with practitioners, and improve clinical outcomes (Beck et al., 2017).

## **Chapter Two: Review of the Literature**

The literature review was performed on 9/26/2018 using CINAHL, PubMed, and ECU Advanced One Search databases. Through the search of these databases total 360 potentially relevant titles were identified.

### **Methodology**

**Sampling strategies.** Among 360 titles identified, PubMed yielded 70, CINAHL 22, and Advanced One Search 268 results. Inclusion criteria were based on the application of subject headings and keywords along with filters. After applying inclusion criteria based on subject headings and keywords (MH "~~Self-Care~~Self-Care") + (MH "Diabetes Mellitus, Type 1") or (MH "Diabetes Mellitus , Type 2") or (MH "Diabetes Mellitus, Gestational") or (MH "Diabetes

Mellitus') and (MH "Education") in CINAHL, ("self-management or self-care," "diabetes or diabetes mellitus," "education," "United States of America or United States") in PubMed, and ("self-management or self-care," "diabetes or diabetes mellitus," "education," "referrals," United States of America, or America or United States") and ("diabetes self-management education," "primary care," "enhancing access," "national standards") in Advanced One Search, 70 results remained from PubMed search, 22 from CINAHL search, and 268 from Advanced One Search. In addition, during electronic literature search six filters were applied in PubMed, such as "review," "scientific integrity review," "systematic review," "5 years," "humans," and "English," one filter applied "5 years" in CINAHL, and eight filters were applied in Advanced One Search, such as "last 5 years," content type "journal article," discipline "medicine," subject terms "diabetes," language "English," "limiting to items with full text online," "scholarly materials," "included peer-reviewed publications." Exclusion criteria were based on the elimination of the duplicates or containing differing, not relevant or not applicable concepts along with three exclusion filters, such as newspaper articles, book review, and dissertations in Advanced One Search. Exclusion criteria all together eliminated 342 articles and remained 18 articles as the most relevant and applicable to the topic. Additionally, eight more articles were found through Advanced One Search that were pertained to the topic after using key words "evidence based practice implementation models," "evidence-based practice models for organizational change," "teaching evidence-based practice," "self-management support in chronic illness," "chronic disease self-management concept analysis," "approaches to self-management in chronic illness," "diabetes self-management education and medical nutrition therapy," and "patients referred to diabetes education."

**Evaluation criteria.** A literature review was presented by evidenced-based articles within last five years. According to Melnyk and Fineout-Overholt (2011), there are seven levels of evidence with the one is the strongest level and the seven is the weakest level. A level one includes systematic review and meta-analysis of randomized controlled trials along with clinical guidelines based on systematic reviews or meta-analyses. A level two incorporates one or more randomized controlled trials. A level three includes controlled trials without randomization. A level four presents case-control or cohort study. A level five consists of systematic review of descriptive and qualitative studies. A level six includes single descriptive or qualitative study. A level seven presents expert opinion (Melnyk & Fineout-Overholt, 2019). In this paper evaluation criteria included the following levels of evidence: one, four, five, six, and seven (see Appendix A).

### **Literature Review Findings**

A systematic review of literature conducted by Schinckus et al. (2014) suggested that diabetes self-management education should be carried out in accordance with diabetes self-management program guidelines to avoid diabetes-related complications, worsening patients' condition and requiring high healthcare costs (Wu, 2017). Several published studies demonstrated that diabetes self-management training programs led to fewer hospitalizations and decreased overall healthcare utilization and costs. Systemic reviews of trials showed that diabetes self-management education (DS-ME) with comprehensive lifestyle interventions and self-management support provided highly favorable and sustaining effects, associated with a reducing risk for cardiovascular complications and improving quality of life (Wong et al., 2014).

A study conducted by Sherifali, (2017) is the first comprehensive evidence-based review of diabetes coaching, using a complex health service intervention checklist. Systematic review

procedures were consistent with conducting comprehensive search strategies. The present study contributes to the growing body of literature related to coaching, specifically by describing the components of diabetes coaching (Sherifali, 2017).

The US population-based study, using the data from supplemental Diabetes Care Survey (DCS) in Medical Expenditure Panel Survey (MEPS), examined demographic and socioeconomic factors, impacting the choice of various DS-ME venues and the impact of different venues used for DS-ME on medication adherence among different demographic and socioeconomic groups. This study established that demographic and socioeconomic factors, such as age, income, educational levels were significantly associated with flexibility in choosing DS-ME venues and the type of received DS-ME (Wu et al., 2017).

Patients with higher incomes, college degrees, and adequate health literacy and younger individuals were more likely to receive DS-ME from multiple venues, navigating additional resources beyond physicians' counseling. They were more likely to use other resources, such as discussions, group classes, courses, or information technologies. Younger patients due to a greater access to internet, were also more likely to search for diabetes self-management information via internet or from group classes. Older patients, who are usually more inclinable to greater diabetes severity and comorbidities or those of little education, with inadequate health literacy, and lower incomes, were more likely to receive DS-ME from a single health care provider. Such a venue of DS-ME was more suitable to meet their specific psychosocial and emotional needs (Wu et al., 2017).

Azar et al. (2015) evaluated the benefit of education among patients with diabetes in clinical settings. These authors examined the effectiveness of clinic-based behavioral lifestyle counseling/educational interventions in promoting weight loss among patients with diabetes.

Research conducted by Azar et al. (2015) have been shown the efficaciousness of behavioral lifestyle interventions in diabetes management.

Large clinical trials have shown the connections between different predictors and diabetes outcomes. Usually, dietary adherence is the most predictive factor of HbA1c, the long-term measure of glycemic control. Glucose self-monitoring is the most predictive factor of fasting blood glucose (FBG), the short-term measure of glycemic control. Physical activity is the best predictor for basic metabolic body mass index (BMI). Self-efficacy is a strong predictor of all adherence behaviors (Brown et al., 2016).

In contrast to most other studies of self-management programs, the aim of the observational matched cohort study of a large number of diabetic patients conducted by Wong et al. (2014) was to evaluate the effectiveness of the Patient Empowerment Program (PEP). This study investigated the impacts of PEP on clinical outcomes and health services utilization in primary care settings and demonstrated improvements in metabolic control associated with PEP (Wong et al., 2014).

According to a systemic review of the literature conducted by Horigan, Davies, Findlay-White, Chaney, and Coates (2017), it had been found that “of those diagnosed with Type 1 diabetes, education was recorded as being offered to only 2.4%, of whom only 1.1% were recorded as attending. Similarly, of people with Type 2 diabetes, 6% were recorded as being offered diabetes education and only 1.6% were recorded as attending. In those newly diagnosed with diabetes... 3.9% of people with Type 1 and 16.7% of people with Type 2 diabetes recorded as being offered education and only 0.9% and 3.6%, respectively, attending” (p.5). These authors emphasized the necessity to involve physicians in a referral process and to improve access to structured education to increase attendance.



The systematic review was conducted to determine reasons for not attending structured education. Five electronic databases were searched for the period between 2005 and 2015 and 12 studies were included in the analysis with a total of 2260 participants (Horigan et al., 2017). Across the studies, reasons were investigated that prevented patients' attendance (lack of time, work commitments, venue being too far away, illness or disability, travel cost, and lack of health insurance coverage) and their willingness to attend (lack of perceived benefit or lack of enthusiasm from the health care professionals offering the education, receiving insufficient information about the course, and also emotional, cultural, and psychological issues). Patient-centered approach should be added to structured education focused on content and quality (Horigan et al., 2017). The biomedical and psychological benefits of structured education have been established in numerous academic papers (Speight & Deakin, 2016).

Studies conducted by Lepard et al. (2015) have reported numerous challenges related to the availability and sustainability of DS-ME in rural areas. These authors examined the scientific evidence for interventions specifically designed to provide education and support for patients with diabetes in rural areas to improve diabetes-related outcomes. The systematic literature review of self-management interventions for patients with diabetes living in rural areas conducted by Lepard et al. (2015) showed that both telehealth and face-to-face interventions result in improved diabetes knowledge-related and behavioral outcomes. Interventions delivered in a patients' homes may facilitate their self-care and support in communities located in a considerable distance from DS-ME classes (Wu et al., 2017).

### **Limitations of Literature Review Process**

The authors of the studies incorporated in the literature review acknowledged certain limitations that need to be discussed. For instance, limitations of the study conducted by Chomko

et al. (2016) included a relatively small sample, loss of post intervention data due to A1C measurement occurring outside the three months window, biases towards more compliant patients who returned for follow-up visits, and the potential effect of medications diabetes-related outcomes. Schinckus et al. (2014) also mentioned in their limitations the small sample of the review due to the restrictions of the search terms. In addition, the authors described such limitations, as the limited number of articles meeting all the inclusion criteria, leading to the difficulty in drawing far-reaching conclusions from the content analyses, an inadequate representation of the variety of existing DSM programs, and the lack of framework regarding implementation fidelity concept.

Limitations of the study performed by Pillay et al. (2015) were a risk of bias, indirect, and as a result exploratory subgroup analyses, and reporting outcomes shortly after the intervention had occurred. The risk of potential bias is also mentioned among limitations by Lepard et al. (2015) along with the difficulty of comparing data from different studies, the lack of confidence that all relevant literature was identified. In addition, these authors emphasized that interventions were different lengths, focused on various outcomes, designed for different cultural group, making comparison across studies challenging. These authors also mentioned an inadequate length of follow up as a possible reason for lack of significant improvement in HbA1c and BMI (Lepard et al., 2015).

Brown et al. (2016) also indicated a publication bias that is a potential threat to any systematic review and related to the fact that statistically significant research findings were more likely to be published than are non-significant results. Therefore, published research may not be representative of the entire body of literature on a given topic.

Wu et al. (2017) in their article addressed some limitations, such as observational research design, utilizing the secondary data source, leading to the limitation of the findings, cross-sectional design providing a snapshot for a short time span, but without assessing a long-term effects of the different types of DS-ME on medication compliance, the lack of information about education materials, patient- provider interaction, and patient satisfaction with DS-ME, the measurement of medication adherence using pharmacy record limiting the ability to assess whether respondents took their medications, and the lack of laboratory data limiting an ability to assess glucose control.

Wong et al. (2014) indicated that limitations in their study included the participation of the more motivated patients in the study, the presence of additional interventions, and the lack of matching the control subjects by all potential confounders. Martin et al. (2013) stated that limitation in their study was the constrained scope of the survey sampling, limiting the participation to AADE members that made it difficult to determine whether the proportion of certified diabetes educators is changing. Azar et al. (2015) determined that the limitations of their study were the possibility of selection bias, the lack of examination of medication adherence and patient-initiated lifestyle modifications.

Sherifali (2017) discussed that the study's limitations included the inclusion in the study only studies published in English and those demonstrating clinical or statistical significance for coaching along with the restriction in the reporting of patient-relevant outcomes in the literature, such as quality of life and self-efficacy. Winkley et al. (2018) stated that limitations of their study included a different topic guide being used for individual and group interviews to reduce the time burden on the groups. Another limitation, that after the initial pilot interview with a variety of general practitioners, subsequent interviews involved nurses only.

## Discussion

Interventions, incorporating collaborative goal-setting, self-management plans, and motivational support, are more likely to be associated with positive outcomes. The varying success of these interventions can be associated with access and attendance issues, the most common factors limiting uptake of DS-ME. Insufficient idea of diabetes and its complications, unawareness of the actual content of educational program and, also, elderly age, disability, and literacy and learning difficulties contribute to this problem (Lepard et al., 2015). DS-ME should adequately address individual learning needs and psychological issues because they contribute to the onset of diabetes and impact an ongoing diabetes self-management (Winkley et al., 2018).

Health care professionals (HCPs) should identify factors improving the content and uptake of educational programs. The group mode of delivery improves interactions between patients with diabetes enabling them to learn from one another and share their knowledge and experience. A continuous access to supportive resources provides better outcomes than educational sessions. HCPs should refer patients with diabetes to DS-ME courses to provide patients with diabetes an evidence-based information related to self-care, thereby saving time for assessment and treatment in primary care settings. HCPs need more training in terms of how navigate DS-ME to assist patients with diabetes. They also should encourage patients to attend diabetic classes and be responsive for DS-ME for patients who are not eligible to attend (Winkley et al., 2018).

Diabetes education varies in curriculum form and content, group size, classes duration, and session number and length (Azar et al., 2015). In accordance with National Standards, the majority of DS-ME programs have a written curriculum, a critical component of diabetes education that should be a part of every DS-ME program (Martin et al., 2013). Goal setting and

action planning of the curriculum of educational programs embrace a wide range of diabetes self-management and support issues, such as a diabetes-specific knowledge, healthy diet, physical activity, medication adherence, self-monitoring, management of complications, and treatment of side effects (Wong et al., 2014).

Alternative activities to group-based sessions, such as discussions, online courses, and self-directed internet searches outcomes may be utilized, if traditional education services are insufficiently flexible to meet patients' needs (Speight & Deakin, 2016). The use of other sources, in addition to formal DS-ME, may provide flexibility in choosing DS-ME venues that suit to patients' schedules, learning styles, educational level, and sociodemographic characteristics. They may receive DS-ME from various sources, such as discussions, online courses, and self-directed internet searches outcomes (Wu et al., 2017).

Diabetes coaching, an intervention supporting the ongoing needs of patient, facilitates the learning process within framework of behavioral change modification, knowledge acquisition, and skill-based training. Diabetes coaching also enhances patients' motivation and self-efficacy, improves medication adherence, and provides support and resources. A tailored feedback to patients and obtaining feedback from patients improve healthcare utilization and promote patient-centered care. Obtaining feedback from the patients allows to tailor educational process to their individual needs. Diabetes coaching promotes achieving a good glycemic control and optimal blood pressure (Sherifali, 2017).

In rural communities, access to care is limited by a number of providers, distance to providers, lack of transportation and community resources. Telehealth presents a unique way to improve self-management, using fewer resources. Promising strategies to increase diabetes

education and support in rural areas include home-based video, telephone hotlines, telemedicine, web-based education, and community-health workers' interventions (Lepard et al., 2015).

**Conclusion of findings.** A current evidence suggests the effectiveness of diabetes self-management education (DS-ME) on improving diabetes care and glycemic control. Ultimately, innovative strategies should be implemented to enhance diabetes self-care to improve the patient experience of care, the health of populations, and to reduce the per capita cost of health care (Institute for Healthcare Improvement, 2018). Health care providers in primary care settings should refer patients to structured classes to provide their understanding of how behavioral pattern impacts diabetes status. Patients with newly diagnosed diabetes may be particularly motivated to attend diabetes education classes and to be receptive to learning about diabetes self-management through behavioral lifestyle change (Azar et al., 2015). All patients with diabetes should be encouraged to adopt and adhere to self-care behaviors, such as being physically active, eating healthy, quitting smoking, taking medications, and reducing stress through healthy coping.

The findings of several studies suggest that behavioral lifestyle counseling and education and attending individual sessions or group-based classes offered at outpatient clinics can be beneficial. Group approaches are more cost-effective in sustaining diabetes self-management due to added benefit of social support (Azar et al., 2015). Diabetes education classes improve patient interactions, save providers time to perform assessment and treatment in primary care clinics, and improve patient outcomes (Winkley et al., 2018). These findings are consistent with other studies where group interventions help to improve patients' glycemic control and promote weight loss (Azar et al., 2015).

Patients with diabetes can use other sources in addition to formal DS-ME, which will give them flexibility in choosing DS-ME venues that suit their schedules, learning styles,

educational level, and sociodemographic characteristics. They may receive DS-ME from various sources, such as discussions, online courses, and self-directed internet searches outcomes (Wu et al., 2017). A tailored feedback to patients and obtaining feedback from patients allow to establish patient-centered care and adapt educational process to their individual needs (Azar et al., 2015).

Norris et al. (2002) stated that DS-ME “was associated with improvement in knowledge, frequency, and accuracy of self-monitoring of blood glucose, self-reported dietary habits, and glycemic control” (Lepard et al., 2015, p. 2). Specifically, the patients’ engagement in diabetes classes improves HbA1C by 0.6 percent that is comparable with many medications but does not pose the risk of side effects (Beck et al., 2017). In addition, it had been found that DS-ME programs were decreasing the readmission of diabetes patients with poor glycemic control (Levesque, 2017). However, many patients with diabetes, especially in rural areas, do not receive DS-ME. Many studies emphasized numerous barriers to the availability and sustainability of DS-ME, such as time limited education and support, lack of access of diabetes education and clinical services, limited availability of specialized diabetes programs, minimal case management or individualized care, limited transportation and long-distance travel, and higher rates of poverty (Lepard et al., 2015; Sherifali, 2017). However, there is a paucity of information in the current literature regarding health care providers are lacking a standardized referral process due to being inadequately educated about the significance of diabetes education to improve diabetes-related outcomes. Ultimately, a quality improvement project (QI) aiming at providers’ education to establish an effective referral process is necessary to add new means in efforts to foster diabetes self-management.

**Advantages and disadvantages of findings.** Receiving DS-ME from additional sources provides a quick access to information, but it may not specifically address individual learning

needs and not significantly affect medication adherence. Health care providers are well positioned to address behavioral, psychosocial, and emotional issues that may impact medication adherence and so they remain the primary source of individualized information tailored to meet diabetes self-management goals.

However, few research studies assessed the use patterns of DS-ME and their impact on diabetes care outcomes. More studies are needed to determine whether the number and type of educational sources improve medication adherence and examine what educational factors that can effectively improve medication adherence in patients with diabetes. Due to a multi-faced nature of diabetes self-management, an integrated approach is needed to enhance self-care among patients with diabetes to achieve improved outcomes (Wu et al., 2017).

**Utilization of findings in practice.** Diabetes educators should be engaged in preventive activities in accordance with increasing the number of patients being at risk for diabetes (Martin et al., 2013). Clinicians should utilize existing resources for education to promote weight loss and reduce risk for diabetes-related complications. Health care providers in primary care settings should refer patients to structured classes to provide their understanding of how behavioral pattern impacts diabetes status (Azar et al., 2015). Literature review findings demonstrated the cost-effectiveness of diabetes education and revealed a need to raise physicians' awareness of DS-ME benefits and timely referrals to diabetes educators (Martin et al., 2013).

By facilitating referral process through creating a computer card and educating providers on the importance of diabetes education along with providing them with Diabetes Self-management Education and Support Algorithm, the quality improvement project was expected to increase the number of referrals to diabetes education with a resulting improvement in diabetes-related health outcomes.



## **Summary**

Diabetes self-management education should be carried out in accordance with diabetes self-management program guidelines to avoid diabetes-related complications worsening the patients' condition and requiring high healthcare costs. Diabetes self-management training programs led to fewer hospitalizations and decreased overall healthcare utilization. Diabetes self-management education with comprehensive lifestyle interventions and self-management support provided highly favorable and sustaining effects, associated with reducing risk for cardiovascular complications and improving quality of life.

Therapeutic lifestyle changes, such as blood glucose monitoring, meal planning, physical activity, and smoking cessation are fundamental to achieve treatment targets, minimize the use of diabetes medications and reduce the risk of diabetes-related complications and psychological distress. DS-MES is critical for successful self-management of diabetes. A diabetes education should be based on the assessment of patients' current knowledge, health beliefs, cultural influences, comorbid conditions, financial status, social support, and literacy. The diabetes self-management plan should be based on a thorough assessment of the patient needs.

## **Chapter Three: Theory and Concept Model for Evidence-based Practice**

A comprehensive approach to manage chronic illness requires health care providers' have adequate knowledge and skills to provide individualized patient-centered care and patients' education in the self-management of their condition (Miller, Lastier, Ellis, & Buelow, 2015). The literature review supports the scientific validity of such an approach. Educational interventions adapted for individual needs of the patient. Patient participation in decision-making helps chronic illness self-management and impacts the clinical process (Kawi, 2012). Healthcare

providers should be aware of the benefits of referring patients to educational programs and available community resources to provide the continuous process of education and support in patients' self-management of diabetes (Novak, Costantini, Schneider, & Beanlands, 2013).

Diabetes, as a condition of long duration with slow progression, requires self-management throughout a lifetime to prevent diabetes-related complications. Living with diabetes necessitates patients' adequate knowledge, skills and personal adjustments tailored to managing the complex care and developing strategies of self-management integrated into their daily life on ongoing basis. Collaborative relationships with patients allow providers to increase patients' knowledge, skills, and self-efficacy in self-management of diabetes (Kawi, 2012). Healthcare providers and patients' partnerships set goals, plan actions, make decisions, problem solve, and provide resources for chronic illness management (Miller et al., 2015). Such a collaboration promotes positive behavioral changes, improved quality of life, better clinical outcomes, and efficient use of healthcare resources, which results in reducing service utilization and health care costs (Kawi, 2012). Concept analysis of chronic illness management is necessary before it is applied to practice and research (Novak et al., 2013). To guide changes in diabetes management, a concept analysis was performed. Then, Swanson's Theory of Caring and Plan Do Study Act (PDSA) change model were applied to the QI project proposal.

### **Concept Analysis**

*Diabetes Self-Management Education (DS-ME) and Diabetes Self-Management Support (DS-MS)*

According to American Diabetes Association Standard of Medical Care in Diabetes (2019) "all people with diabetes should participate in diabetes self-management education to facilitate the knowledge, skills, and ability necessary for diabetes self-care" (p. S46). Diabetes

management concepts in this QI project are: *diabetes self-management education (DS-ME)* and *diabetes self-management support (DS-MS)* (Chomko et al., 2016). DS-ME provides patients with diabetes knowledge, teaches them healthy lifestyle behaviors, trains them decision-making and problem-solving skills to engage them in self-management practice (Chomko et al., 2016). DS-MES supports informed decision making, self-care behaviors, and active collaboration with health care providers to improve clinical outcomes and quality of life (ADA, 2019).

A conceptual framework provided by Swanson's Theory of Caring and Evidence Based Practice (EBP) model presented by the PDSA change cycle were used in this project to create prerequisites for provider's education about DS-MES benefits to make referrals to diabetes classes and one-to-one individual sessions with a health coach to improve patients' outcomes. The principles of Swanson Theory of Caring based on a holistic philosophy of care were an effective guide to clinical practice. The caring actions of Swanson's theory encouraged patients toward healing and provide them access to adequate, safe, timely, individualized care, meeting to their unique needs, condition, and context. Swanson Theory of Caring allowed providers to teach patients coping strategies for diabetes self-management through DS-ME and make available proper resources through DS-MS, thereby improving health outcomes in patients with diabetes. The application of Swanson's Theory of Caring to practice by using the referring process provided continuity and coordination of care (Butts & Rich, 2015).

Evidence-based practice (EBP) is a "problem solving approach to clinical decision-making that involves the conscientious use of the best available evidence...with one's own clinical expertise and patient values and preferences to improve outcomes for individuals, groups, communities, and systems" (Schaffer, Sandau, & Diedrick, 2012, p. 1198). Meaningful use of evidence to manage clinical issues depends on the ability of healthcare providers to

analyze evidence, judge its usefulness, evaluate its strength, and remain objective while using evidence in problem solving. Critical thinking is the quintessence of professionalism for healthcare providers and a key component in applying evidence to their daily practice (Canada, 2016).

### **Theoretical Framework**

Swanson's Theory of Caring was applied to development of this project to improve health outcomes in patients with diabetes. This theory was an effective guide to clinical practice because of its discussion on caring processes (Butts & Rich, 2015). Caring processes were consistent steps to promote patients' emotional and physical well-being. They gave patients reasons for healing, took into consideration their unique condition and context, provided their access to care, assumed responsibility for the quality of care, and taught patients healthy behaviors and self-monitoring their illness.

#### **Application to practice change**

The concept of "maintaining belief", fundamental in Swanson's theory, referred to inspiring patients with assurance of healing and increasing motivation for recovery. "Knowing", another component of Swanson's caring theory, implied providing individualized care and appropriate interventions during caring encounter. "Being with", the next caring process, suggested providers' availability for patients on an ongoing basis. "Doing for", the fourth element of the theory of caring, meant addressing patients' individual needs by referring them to diabetes classes and one-to-one individual sessions with a health coach. Finally, "enabling", the most critical step, was related to guiding and teaching in diabetes classes and individual sessions about patients daily self-management decisions and activities. Enabling empowered patients with

coping strategies and providing emotional and informational support in positive behavioral change and making rational decisions in problem solving (Butts & Rich, 2015).

### **EBP Change Theory**

The current EBP models provide consistency and reliability in health care, promotes patients' safety, improves quality care and patient outcomes, and reduces health care costs (Canada, 2016). In this QI project, Edward Deming's Plan-Do-Study-Act (PDSA) cycle (1950) was used for improving the quality of care. The essential components of this model were "plan," "do," "study," and "act." The first step was "plan" refers to the identification of the problem and factors causing this problem, the designation of the aim and the ways of the solution of this problem, the expected effects of this solution, the assignation of the performers of this solution with determining their roles and responsibilities, and the assessment of the findings of the implementation of proper interventions in the light of the solution of this problem and possible consequences of implementing plan within the system. The second step "do" was related to carrying out the appropriate change and documenting the findings of this change. The next step, "study," presented collecting and analyzing data concerning these findings before and after the change and review data to assess changes in the light of predicted outcomes. Finally, the fourth step, "act," was a consideration whether the received outcomes are satisfactory, or the further change is needed (Donnelly & Kirk, 2015).

#### **. Application to practice change.**

In QI project, the "plan" of PDSA cycle included collecting baseline data about patients' referrals, planning providers education sessions in the project site, searching for Diabetes Self-management Education and Support Algorithm, and creating a computer card. The "do" incorporated providing education sessions to primary care providers about diabetes education

importance along with handing them Diabetes Self-management Education and Support Algorithm and distributing a computer card. The “study” conducted to analyze whether the implemented interventions led to increase in patients’ referrals. The “act” performed to conclude whether the results of the project were satisfactory. If benchmarks were achieved this cycle could be repeated using the same intervention. If benchmarks were not achieved, new strategies could be developed to reach objectives (Hodge et al., 2014). The “act” of the PDSA cycle, also, ensured that practice changes were implemented as planned.

### **Summary**

The principles of Swanson Theory of Caring were fundamental because they provided a conceptual framework for caring processes and allowed providers to meet patients’ needs by referring them to diabetes classes and individual sessions with a health coach to learn diabetes self-management and coping strategies. The PDSA cycle promoted the integration of evidence into daily practice through planning (collection of baseline data about patients’ referrals, preparation for providers education sessions, and creation of a computer-card), doing (education sessions for primary care providers and a computer-card development), studying (analysis whether there was an increase in patient’s referrals), and acting on what was learned (the process repetition if results were satisfactory and the new strategies development if benchmarks were not achieved).

The concepts of diabetes self-management education and diabetes self-management support emphasized the usefulness of diabetes classes and the importance of referral process. Providers’ awareness about benefits of referring patients to diabetic classes and one-to-one individual sessions with a health coach increased the number of the patients’ referrals. Knowledge, skills, and healthy lifestyle habits acquired by patients in diabetic classes and

individual sessions were sustained due to referring them to appropriate community resources. Finally, referral process led to the increased use of primary care and preventive services and decreased use of acute care and inpatient hospital services, which reduced healthcare costs.

#### **Chapter Four: Pre-implementation Planning**

Current evidence supports the effectiveness of diabetes self-management education (DS-ME) on improved clinical outcomes among diabetic patients. DS-ME has a positive impact on knowledge, medication adherence, dietary habits, and glycemic control (Lepard et al., 2015). The American Diabetes Association (ADA) guidelines proposed that in addition to DS-ME patients should receive ongoing support (Lepard et al., 2015). Despite the benefits of DS-MES classes, they are underused.

##### **Project Purpose**

The purpose of this quality improvement (QI) project was to increase the number of referrals to diabetes classes or one-to-one individualized sessions with a health coach. The purpose was achieved with computer card reminders about referrals as well as providers and a health coach's education on the importance of diabetes education along with providing them with an educational material – “Diabetes Self-management Education and Support Algorithm.”

##### **Project Management**

**Organizational readiness for change.** Prior to the project implementation the project site has already developed the Diabetes Self-Management Education and Support (DS-MES) Program to provide outpatient diabetes management services on self-management skills. The program helped patients with diabetes understand the disease process, prevent or minimize complications, and adhere to treatment goals determined with healthcare providers. The

program's mission was to improve self-management skills and quality of life for diabetic patients in a local community. This program was well organized. The VP of the institution met with the project leader to discuss the program's mission, vision, and goals. The Program Advisory Committee, consisting of seven members, coordinated the program. DS-MES Program Advisory Council (PAC) reviewed the program curriculum, individual and aggregate outcome data, annual program plan and evaluation, and results of quality improvement projects. PAC also reviewed concerns related to the program, community and national data relevant to diabetes, recommendations for program improvement, and resolution of access issues for the community to DS-MES services. Annual in person meetings were organized by the PAC with the members of DS-ME teams, as well communication via phone, email and electronic meetings. DS-ME teams, consisting of health coaches and dieticians in the surrounding counties provided education, coaching, and support services for patients with diabetes. (D. Thompson, personal communication, September 5, 2018). The local clinical site, the proposed project site, hired a health coach the year prior to implementation, who helped providers identify patients who needed DS-MES classes and conducted one-to-one individual sessions (M. Boyce, personal communication, September 26, 2018).

The administrative team was open and willing to work with the project leader and expressed desire for change. The Program Advisory Committee Coordinator, Site Champion, Practice Manager, and Health Coach showed an interest in the proposed DNP project. The administrative team held telephone and face-to-face meetings to discuss project implementation at their site. They agreed to help collect data necessary to begin the project. The Program Advisory Committee Coordinator proposed to discuss the project implementation plan and organized an hourly tele-phone conference. The Site Champion offered to run reports to identify



the patients with diabetes who were referred for DS-ME and referrals reports. She also suggested the content of the computer cards and assisted with their lamination. The Practice Manager offered an assistance with providing a *read-only view* of their department's electronic health records (EHR) to examine medical records for DS-ME documentation and organized a meeting with providers and a health coach to perform a PowerPoint presentation. The Health Coach informed a project leader regarding the successes of the program in improving of A1C in the patients with diabetes and suggested to refer any patient with diagnosis of diabetes and a knowledge deficit to DS-ME and one-to-one individual sessions with a health coach.

### **Interprofessional collaboration.**

*Interprofessional teamwork* is the cooperation, coordination, and collaboration between professions to deliver safe patient-centered primary care. *Teamwork* requires collaboration between HCPs, pharmacists, social workers and case managers, clinical psychologists, and administrators. *Interprofessional team-based care* is delivered by work groups with shared responsibility for patients in health care (Core Competencies for Interprofessional Collaborative Practice, 2011).

To develop competencies for team-based care, continuing education is needed. Health professionals should practice to their full scope and optimally and cost-effectively meet patient, family, and community health care needs. Health professionals' full scope of knowledge, skills, and abilities provides safe, timely, efficient, effective, and equitable care to patients (Core Competencies for Interprofessional Collaborative Practice, 2011).

Successful project implementation was impossible without interprofessional collaboration. The Program Advisory Committee Coordinator participated in the project implementation plan and timeline of the project and defined the roles and responsibilities of

participants. The Site Champion contributed to the project implementation by providing reports of diabetic patients and monthly and weekly referrals reports and creating computer cards. The Practice Manager promoted the project implementation by giving an access to *read-only view of* their department's EHR to check the completion of DS-ME and assisted with a PowerPoint presentation. The Health Coach provided information regarding the successes of the program in improving of A1C in the patients with diabetes, revised referrals criteria for a computer card, and conducted one-to-one sessions to educate the patients on diabetes self-care. The Providers of the clinic and Health Coach identified diabetic patients and referred them to DS-MES classes and one-to-one individual sessions with a health coach. The Providers signed orders for nutrition and health coaching. When patients were referred to DS-ME classes the health coaches and dieticians helped the project application to practice by teaching patient's diabetes knowledge and self-care behaviors.

**Risk management assessment.** SWOT analysis (strengths, weaknesses, opportunities, threats) is a business strategy tool for the comparative assessment of an organization regarding its competitors (Teoli & An, 2019).

Among organization strengths was that the institution had previously created a Diabetes Self-Management Education and Support Program to meet the diabetic patients' needs. The goals of this program were to provide comprehensive diabetes self-management education meeting the individual needs diabetic or pre-diabetic patients. DS-ME was tailored to patient readiness to diabetes education and combine the services of Health Coaches and Registered Dieticians under common curriculum. This program also incorporated the concepts of diabetes knowledge, skills, and attitudes into an environment which is favorable to self-management. The focus was on patients and caregivers that needed knowledge and skills in areas of diet,

medication, exercise, healthy coping, and glucose measurement, problem solving, and risk reduction (D. Thompson, personal communication, September 5, 2018).

However, the organization had a few weaknesses. The program was still fairly new to the site so providers were lacking the knowledge of the program and its benefits that led to an inadequate referral process to diabetes education. As a result, the patients had no opportunity to benefit from excellent resources (K.C. Whitley, personal communication, September 26, 2018).

Nevertheless, opportunities existed. Opportunities were to increase the number of referrals to diabetes classes and one-to-one individualized sessions with a health coach. This was achieved with computer-cards, reminding providers about referrals, provider education about diabetes education's importance, along with handing them with "Diabetes Self-management Education and Support Algorithm," offering areas of focus and action steps for providers and diabetes education (See Appendices B & C). Potential threats to project implementation were the providers' unresponsiveness to interventions and absence from educational sessions, a patient's unwillingness to attend DS-MES classes, insurance issues and patient cost, lack of transportation, inflexible work schedules, age, disability, mental health, learning difficulty, and cultural issues.

**Organizational approval process.** The project leader met with VP of Care Transformation, Corporate Quality Office. The project received an organizational support. An approval to conduct the project within the institution was granted by a Director of Care Management (see Appendix D).

**Information technology.** Information technology helped effectively calculate the number of patients with diabetes and number of patients referred to DS-ME. All the reports were secured with a password. Reports of the patients seen by providers as well as reports of the

patients with referrals were obtained from the EHR, in addition to a manual check to confirm the number of referrals. Weekly reports with lists of diabetic patients who had been seen by providers and referrals report along with a final report were run by the site Champion and sent to the project leader. The project leader visited the project site on weekly and bi-weekly basis to open EHR of every patient, using MRNs to confirm the number of the patients' referrals. Data collection form created in Excel spreadsheet consisted of three columns: "sequential number," "patient has diabetes," and "referred to DSME class" was used to calculate the number of the patients with diabetes who were referred to diabetes education pre- and postintervention. These numbers were manually converted into the percentages.

### **Cost Analysis of Materials Needed for Project**

The cost of materials needed for the project was negligible other than time that was necessary to analyze data after project implementation. No changes to EHR had been made. The project was implemented on the current materials that were available at the site. The project implementation led to the change in a culture rather than change in utilization of supplies (see Appendix E).

### **Plans for Institutional Review Board Approval**

After completion of the Qualtrics survey, the Project Proposal was submitted for Institutional Review Board (IRB) Approval. The IRB has deemed the project as a quality improvement initiative, not a human research and not requiring a full IRB review. In addition, the site did not require an additional IRB process (See Appendix G).

**Plan for Project Evaluation.** To learn if objectives were met the number of referrals pre-intervention was compared to the number of referrals post intervention. An improved referral process indicated successful implementation.

**Demographics.** Data was collected on the number of patients with diabetes who had been seen by providers during four weeks (pre-implementation) and six weeks (post-implementation) and who were referred to diabetes self-management education classes as well one-to-one individual sessions with a health coach before and after the intervention. Other data, such as sex, race, and age were not collected because it was not pertinent to the outcome of the project. The Site Champion ran a report with the list of diabetic patients who had been seen by providers along with referrals for the month prior to implementation and weekly after intervention. In addition, the same report was collected six weeks post intervention. The criteria for referrals were the diagnosis of diabetes and a knowledge deficit of condition. Among 144 patients that had been seen by providers pre-implementation, 6 patients were referred to diabetes education that accounted for 4.17 percent. Among 245 patients that had been seen by providers post-implementation, 17 patients were referred to diabetes education that accounted for 6.94 percent. Thus, a percentage referral went from 4.17 to 6.94 percent. The expectation is that as time goes on and providers will become more comfortable with a referral process, the number of referrals will keep increasing.

**Outcome measurement.** The outcome measurement of this project was an increase in the number of the patients' referrals after implemented interventions.

**Evaluation tool.** Reviewing the medical records of the patients with diabetes allowed the project leader to determine the number of patients referred to diabetes education in the month prior to implementation and if the diabetes education was completed. This data was compared with the number of patients referred to diabetes education after intervention occurred. A data collection tool in Excel spreadsheet permitted an automatic calculation of the number of patients

with diabetes and number of diabetic patients who were referred to diabetes self-management classes and one-to-one individual sessions with a health coach (see Appendix F).

**Data analysis.** The collected data (the total number of diabetes patients referred to DS-ME) was compared before and after intervention.

**Data management.** Medical Record Numbers (MRNs) and disease status were used to calculate the number of patients with diabetes referred to DS-ME. Patient's identifiers (MRNs) were kept securely password protected on the Excel spreadsheets at the project site. Random deidentified numbers were assigned to the patients protect patient information. Electronic data access was password protected. All printed data were destroyed using a shredder. Demographics, such as race, and gender were not be collected because they were not pertinent to the project outcome. The data on the number of the patients' referrals and the referral rate before and after intervention were presented utilizing visual aids – column charts.

## **Summary**

Organizational readiness for change is a necessary condition for any new project's success. The organizational culture and reward system decrease resistance to change. This organization's readiness for change was reflected in a new program directed at improving a quality of care and clinical outcome [Diabetes Self-Management Education and Support (DS-MES Program)]. This program provided outpatient diabetes management services focused on self-management skills. The organizational readiness for change was also demonstrated by its support and approval of this quality improvement project.

Interprofessional collaborative practice is key to the safe, high quality, accessible, patient-centered care requiring the continuous development of interprofessional collaborative competencies for effective evidence-based teamwork and team-based care. Through

collaborative efforts of DS-MES Program, Vice President, Care Transformation and Program Advisory Committee Coordinator, Site Champion, Practice Manager and Health Coach the data collection, the project implementation and evaluation were executed.

Risk management assessment is necessary to use an organization's strengths and opportunities, overcome its weaknesses, and defeat threats in an organization. This quality improvement initiative intended to maximize this organization's organizational strengths and advantages and minimize its weaknesses and threats on diabetes education.

## **Chapter Five: Implementation Process**

The purpose of the QI project was to increase the number of patients' referrals to diabetes education. The data collection that took place prior to intervention showed a relatively low rate of referrals to diabetes classes and one-to-one individual sessions with a health coach. To increase the number of referrals an education session via a PowerPoint presentation was performed along with providing educational material – "Diabetes Self-management Education and Support Algorithm" and computer cards were distributed to the providers and the health coach.

### **Setting**

The clinic was a part of a private, non-for-profit health system that has a partnership with East Carolina University. The clinic was part of well-established multi-specialty physician group that provided excellent care for the health and wellness of eastern North Carolina's residents. This was a physician provider group with more than 500 providers in 90+ locations (C. Rudd, personal communication, May 17, 2019; Vidant Health, 2019).

### **Participants**

The participants of the project were members of a multi-disciplinary team, consisting of three medical doctors, one Doctor of Osteopathic Medicine, and one health coach. All providers were asked to participate as this was a QI project, implementing standard of care. The exclusion criteria were inability to refer the patients to diabetes education. Since all the providers and health coach were referring patients to diabetes education, nobody was excluded from the participants' group.

### **Recruitment**

There was no specific recruitment process as this practice change was considered the standard of care. All providers at the site were expected to participate in this change after the education was provided. If the providers were not able to attend the live education session, a recorded presentation was made available for the providers to review at their convenience.

### **Implementation Process**

The first step in implementation was obtaining data from the Site Champion on the number of diabetic patients who had been seen at the clinic as well as referrals during the month pre-implementation. An educational PowerPoint presentation was developed and an educational material – “Diabetes Self-Management Education and Support Algorithm” was provided to providers and health coach. This Algorithm was created by Dr. Mick, who is practicing family medicine at Indiana University Health Physicians Primary Care. The Algorithm was used with a written permission of Dr. Mick. A recorded PowerPoint presentation was sent electronically to the providers who were unable to attend the session. This Algorithm described the four critical times to evaluate the need for diabetes education: at diagnosis, annually for assessment of education, nutrition, and emotional needs, when new complicating factors, such as health



condition, physical limitations, emotional factors or basic living needs, arise, and when transitions in care occurred (Mick, 2016).

In addition, laminated reminder computer cards were created based upon recommendations from the Site Champion and the Program Advisory Committee Coordinator. The computer card indicated the conditions requiring referrals, such as patients with diabetes, a new diagnosis, A1C greater than 9, and a knowledge deficit of the condition. If the answer is “yes,” the providers and health coach were advised to place “AMB health coach referral” and “AMB nutrition referral” (L. Owens, personal communication, May 15, 2019). The Health Coach advised that any patient with diabetes would benefit from diabetes education, so the card was modified to patients with diabetes and a knowledge deficit of the condition (K. C. Whitley, personal communication, June 13, 2019).

After the in-person education session, the PowerPoint presentation was sent to the Practice Manager and forwarded to the Providers who could not attend the educational session. After implementation, weekly reports were provided by the Site Champion, reflecting the trends in the number of referrals and the number of diabetic patients that were seen by providers on a weekly basis. The Project Leader visited the site on weekly and bi-weekly basis to examine the medical records of diabetic patients to confirm the number of referrals to diabetes education. At the end of implementation, six weeks later, a final data collection was performed to see if the number of referrals to diabetes education increased. During the entire implementation process, the PDSA cycle was in effect to determine if any changes need to be made. If the implemented interventions led to increase in patients’ referrals, the cycle could be repeated using the same interventions and if benchmarks were not achieved new strategies would be developed to reach the intended objectives.

### **Plan Variation**

A referral form was initially created to remind the Providers and Health Coach to place referrals. However, due to the fact that providers were documenting electronically and placing referrals through the EHR that made a referral form not feasible, a visual reminder – a computer card was created instead. In addition, originally, four Providers were included in the participants' group, then Health Coach was included as well based on her ability to place referrals.

### **Summary**

As a result of the QI implementation the providers were educated regarding the importance of diabetes education and were provided a visual reminder - a computer card. The comparison between the number of referrals pre- and post-intervention allowed to make a conclusion regarding the successful implementation of this QI.

## **Chapter Six: Evaluation of the Practice Change Initiative**

The American Diabetes Association (ADA) Standards of Medical Care in Diabetes introduces a framework for evidence-based disease management. Diabetes self-management education and support (DS-MES), including a referral to a registered dietitian nutritionist (RDN) for individualized medical nutrition therapy (MNT), is fundamental to diabetes education. Evidence-based studies demonstrated that DS-MES led to an improved quality of care (Marincic et al., 2017). This quality improvement project aimed at increasing the number of referrals to diabetes education. To evaluate whether the project was successful the number of referrals pre- and post-intervention was calculated.

### **Participant Demographics**

The participant demographics were three Medical Doctors, one Doctor of Osteopathic Medicine, and one Health Coach. Out of 144 diabetic patients, that had been seen by providers

pre-implementation, six patients were referred to diabetes education that constituted 4.17 percent. The patients' age ranged from 37 to 75. Excel spreadsheet with the number of the patients seen by providers pre- and post- implementation were provided by a site champion.

### **Intended Outcome(s)**

The focus of assessment was a referral rate pre- and post-intervention (six weeks later). The intended outcome was an increase in a referral rate. Pre-implementation referral rate was 4.17 percent and post-implementation referral rate was 6.94 percent that accounted for 66.4 percent increase in the referral rate  $[(6.94\% - 4.17\%) / 4.17\% \times 100\% = 66.4\%]$ .

### **Findings**

In the month of pre-implementation, 144 diabetic patients were seen by providers (L. Owens, personal communication, May 16, 2019). After reviewing medical records, it had been found that only six diabetic patients (4.17%), were referred to diabetes education during that time frame. Post-implementation, 245 diabetic patients were seen by provider, with 17 patients referred (6.94%) (see Appendix H).

### **Summary**

The current evidence suggests the efficacy of DS-MES for improving quality of patients care. DS-MES and MNT are a cornerstone to diabetes education. This quality improvement project was conducted to increase the number of referrals to diabetes education. To evaluate the success of the project the referral rate was compared pre- and post-intervention.

After analyzing data, it had been concluded that there was a small increase in referrals post-implementation (from 4.17 percent to 6.94 percent).

## **Chapter Seven: Implications for Nursing Practice**

The DNP Essentials address the foundational competencies that are core to all advanced nursing practice roles. The DNP Essentials consist of eight Essentials (AACN, pp. 8-17).

### **Practice Implications**

These Essentials include Scientific Underpinning for Practice, Organizational and Systems Leadership for Quality Improvement and Systems Thinking, Clinical Scholarship and Analytical Methods for Evidence-Based Practice, Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care, Health Care Policy for Advocacy in Health Care, Interprofessional Collaboration for Improving Patient and Population Health Outcomes, Clinical Prevention and Population Health for Improving the Nation's Health, and Advanced Nursing Practice (AACN, pp. 8-17). All eight Essentials were reflected in this project.

#### **Essential I: Scientific underpinnings for practice.**

A rise of nursing science expanded the discipline of nursing. The cornerstone of nursing – middle-range theories represents a solid foundation for advanced nursing practice (The Essentials of the DNP Program, 2017). Swanson Theory of Caring is a middle range theory that guided the providers' clinical practice. By “maintaining belief” in the patients' capacity to manage their diabetes, “knowing” their stories through their narrations, “being with” them emotionally present, “doing for” them things meeting their individual needs by referring them to diabetes education, and “enabling” them to deal with their illness by educating them in diabetes classes and one-to-one individual sessions about the self-management of the disease and its complications, coping strategies, and resources available for ongoing support, providers incorporated the principles of Swanson's theory of caring into their daily work (Butts & Rich,

2015). Essential I emphasized the importance of using science-based concepts to improve a quality of care and patient outcomes. Science-based concepts in this QI project were: *diabetes self-management education (DS-ME)* and *diabetes self-management support (DS-MS)* (Chomko et al., 2016).

**. Essential II: Organization and systems leadership for quality improvement and systems thinking.**

Organizational and systems leadership are essential to improve patient and healthcare outcomes. Improvements in practice are impossible “without corresponding changes in organizational arrangements, organizational and professional culture... to support practice” (AACN, p. 10). According to Lewin’s Change Model, there was a three-step process for a planned change implementation: unfreeze, change, and refreeze (Borkowski, 2016). The first step was demonstrated by an organizational support that reflected understanding the difference between a current practice and a desired change. The second step, that involved implementation of a new practice, based on an increased awareness’ of providers and health coach regarding an importance of diabetes education that was a result of an educational session, educational material, and a computer card reminder. This step was impossible without the providers and health coach’s understanding the reasons for change and an active participation of administrative team in the project implementation. The third step was achieved by a constant monitoring of changes to ensure their continuity. The Project Leader met with the Site Champion, Health Coach, and Practice Manager to discuss the post-intervention Project Poster presentation at the clinical site. By conveying the results of the project, demonstrating a small increase in the number of referrals after intervention, the presentation inspired the administrative team to be consistent in implementing changes. The ethical considerations of the project were that an

organizational change was pursued not because of a self-interest of a small group of people in a leadership, but for the sake of improving a quality of care of all diabetic patients that were seen at the clinic. The providers and a health coach were not coerced into making “a change,” but they welcomed “a change” after becoming more knowledgeable regarding the benefits of diabetes education. This quality improvement initiative was cost-effective since the expenses were negligible other than time that was necessary to analyze data after project implementation. The project was implemented on the current materials that were available at the site.

### **Essential III: Clinical scholarship and analytical methods for EBP.**

According to the Essentials of Doctoral Education for Advanced Nursing Practice (2006), “the scholar applies knowledge to solve a problem via the scholarship of application” (AACN, p. 11). This application includes the translation of research into practice and the dissemination and integration of new knowledge. In this project data was collected and analyzed, evidence-based interventions were created and implemented, and practice outcomes were predicted and evaluated. Literature review findings demonstrated the cost-effectiveness of diabetes education and revealed a need to raise providers’ awareness of DS-ME benefits and timely referrals to diabetes educators (Martin et al., 2013). By facilitating referral process through creating a computer card and educating providers on the importance of diabetes education along with providing them with Diabetes Self-management Education and Support Algorithm, this quality improvement project increased the referral rate from 4.17 to 6.94 percent. New knowledge will prompt the providers to refer diabetic patients with a deficit of condition to diabetes education.

**Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare.**

Information systems and patient care technology can be used to support clinical decision making and improve patient care and healthcare systems. Reports of the patients seen by providers as well as reports of the patients with referrals were obtained from the EHRs and presented in Excel spreadsheets. Weekly reports with list of diabetic patients who had been seen by providers and referrals report along with a final report were run by the site champion and sent to the project leader. Data collection form presented in Excel spreadsheet consisted of three columns: sequential number, patient has diabetes, and referred to DSME class and was used to calculate the number of the patients with diabetes who were referred to diabetes education pre- and post-intervention. Essential IV was demonstrated in this project by how information systems and patient care technology can be used to improve clinical outcomes. All the reports used in this project was obtained from the EHRs and presented in Excel spreadsheets. Data collection form created in Excel allowed to calculate the number of the patients with diabetes referred to diabetes education pre- and post-intervention.

#### **Essential V: Healthcare policy for advocacy in healthcare.**

Health care policy is critical to “facilitate...the delivery of health care services or the ability of the provider to engage in practice to address health care needs” (AACN, p. 13). Health care policy addresses issues of equity and social justice in the delivery of health care. Among numerous barriers to the availability and sustainability of DS-ME are time limited education and support, lack of access of diabetes education and clinical services, limited availability of specialized diabetes programs, inadequate case management, limited transportation or long-distance travel, and higher rates of poverty (Lepard et al., 2015; Sherifali, 2017). This project addressed the issues of limited diabetes education and support. Due to appointments time constraints, providers had limited time to provide a diabetes education and support, answer all

the questions, and ensure that patients completely understood their teaching. In addition, providers did not see their patients frequently enough to reinforce a new knowledge and monitor the patients' progress and compliance with medical regimen and lifestyle modifications that were necessary for a successful diabetes management. Often times providers did not acknowledge the efficacy of diabetes education and were not aware of available resources. Diabetes classes and one-to-one individual session with a health coach allowed to provide an additional time to educate diabetic patients regarding medications, blood glucose monitoring, nutrition, risk reduction, personal strategies to address psychosocial issues and concerns and promote health, behavior change, and healthy coping. They also provided support for self-management skills to delay progression of diabetes and prevent new complications. This project increased the providers' awareness of numerous benefits of diabetes education.

**Essential VI: Interprofessional collaboration for improving patient and population health outcomes.**

To provide “safe, timely, effective, efficient, equitable, and patient-centered care in a complex environment, healthcare professionals must function as highly collaborative teams” (AACN, p. 14). *Interprofessional teamwork* is the cooperation, coordination, and collaboration between professions to deliver safe patient-centered primary care (Core Competencies for Interprofessional Collaborative Practice, 2011). Successful project implementation required interprofessional collaboration. Various disciplines were involved in the project development, implementation, and evaluation of data. The DNP student was the leader of the interprofessional team directing the trajectory of the project implementation.

**Essential VII: Clinical prevention and population health for improving the nation's health.**



Clinical prevention and population health are fundamental for improving the nation's health. *Clinical prevention* is "health promotion and risk reduction/illness prevention for individuals and families." *Population health* is "aggregate, community, environmental/occupational, and cultural/socioeconomic dimensions of health" (AACN, p. 15).

In this project aggregate is a group of patients with a diagnosis of diabetes. Clinical prevention is critical to diabetes management because diabetes is the seventh leading cause of death in the United States and a major cause of increasing morbidity, disability, and mortality secondary to its complications (Mays, 2015; Power et al., 2015). Among DS-MES benefits are increased use of primary care and preventive services. According to American Diabetes Association (2019) "all people with diabetes should participate in diabetes self-management to facilitate the knowledge, skills, and ability necessary for diabetes self-care" (p.S46). The concept that DS-MES could potentially improve patient care for individuals diagnosed with diabetes was the emphasis for this project design. DS-MES is an intervention that is feasible across all diverse patient populations.

### **Essential VIII: Advanced nursing practice.**

Advanced practice nurses (APNs) demonstrate advanced levels of clinical judgement and design, deliver, and evaluate evidence-based care to improve patient outcomes. Due to the fact that diabetes is a chronic disease that requires self-care on a daily basis and an inability of many patients provide good care of themselves, DS-MES became a critical factor in improving their health. This project utilized a PowerPoint presentation regarding the importance of referrals, "Diabetes Self-management Education and Support Algorithm," and computer card reminding the providers to initiate referrals. According to this algorithm, there are four critical times when APNs assess, provide, and adjust diabetes self-management: at diagnosis, annually, when new

complicating factors arise, and when transition in care occur. At diagnosis, APNs answer questions and provide emotional support to their patients, educate their patients regarding treatment and treatment goals, teach them survival skills to address immediate concerns, identify and discuss resources for education and support, and make referrals for DS-MES and MNT. Annually, APNs assess all areas of self-management, review problem solving skills, and identify strengths and challenges of living with diabetes. When new complicating factors arise, APNs identify presence of factors that influence diabetes self-management, discuss effect of complications, and help to develop treatment goals. When transitions in care occur, APNs develop diabetes transition plan, communicate this plan to other health care team members, and initiate DS-MES regular follow-up (Mick, 2016). These evidence-based interventions allow APNs to guide patients with such a complex condition as diabetes.

### **Summary**

All the DNP Essentials are reflected in this project and included applying Swanson Theory of Caring to improve a clinical practice, changing in organizational arrangements and culture to support practice, translating of research into practice and disseminating and integrating of new knowledge, utilizing information systems and patient care technology to improve clinical outcomes, using health care policy to address issues of equity and social justice to facilitate the delivery of health care services, working in collaborative teams to provide a high-quality patient-centered care, highlighting an importance of clinical prevention and population health to improve the nation's health, and emphasizing an ability of APNs to design, deliver, and evaluate evidence-based care and demonstrate advanced levels of clinical judgement.

## **Chapter Eight: Final Conclusions**

The Institute of Medicine identified the problem of high-quality evidence failing to reach a routine clinical practice. According to the Sicily Statement (a consensus statement on EBP) “all health care professionals need to understand the principles of EBP, recognize EBP in action, implement evidence-based policies, and have a critical attitude to their own practice and to evidence” (Weyant, 2019, p. 98). The five-step model of EBP described in Sicily Statement included: translation of uncertainty to an answerable question, systematic retrieval of best evidence available, critical appraisal of evidence for validity, clinical relevance, and applicability, application of results in practice, and evaluation of performance (Weyant, 2019). All these steps were reflected in this QI project that had a goal to implement evidence-based interventions to improve a quality of care and clinical outcomes in diabetic patients.

### **Significance of Findings**

The clinical significance of the project is that the referral rate increased from 4.17 percent to 6.94 percent after an educational session, educational material, and computer card reminder were provided. A current evidence supports the effectiveness of diabetes self-management education (DS-ME) on improving diabetes care and glycemic control. This project demonstrated that providers and health coach’s education regarding the importance of DSME can increase the rate of referrals, thereby increasing the number of patients attending diabetes classes and individual sessions, leading to improved clinical outcomes and quality of care of diabetic patients.

### **Project Strengths and Limitations**

The project had numerous strengths that made its implementation successful. Prior to the project implementation, the organization had already developed the Diabetes Self-Management Education and Support Program, that made DSME classes assessible for the patients who were

referred to diabetes education. In addition, the project site hired a health coach the year prior to implementation, who helped the providers identify patients who needed DSME classes and conducted one-to-one individual sessions with diabetic patients at the project site. Patients were more likely to attend one-to one individual session after the doctor's appointment than return for this session at another time (M. Boyce, personal communication, June 13, 2019).

The project received organizational support from the administrative team which assisted with successful implementation. Strong interprofessional collaboration was another strength. All of the team member had defined roles, were enthusiastic about the project, and contributed equally to the project implementation. Finally, the cost of materials needed for the project was negligible other than time that was necessary to analyze data after project implementation that made the project cost effective and financially feasible.

The limitations of the project were a relatively short time for the project implementation (six weeks) and low providers' attendance of educational session due to a busy schedule. To overcome the problem of providers' low attendance to those providers who were unable to attend the session, a recorded PowerPoint presentation was sent electronically. Another limitation could be the fact that the pre-intervention data for referrals was only from the four-week period and may not be reflective to the true referral rate.

### **Project Benefits**

The benefits obtained from the project were increased provider and health coach awareness regarding DSME advantages, a deepened knowledge about critical times to assess, provide, and adjust diabetes self-management education and support, and a constant reminder about the necessity of referrals via computer card. These interventions led to a small increase in

referrals, allowing more patients to attend diabetes classes and one-to-one individual sessions, thereby improving their health and well-being.

### **Recommendations for Practice**

The goal of this project was to increase the number of referrals to diabetes education by raising awareness of providers and health coach regarding the importance of DSME. To ensure a continuity of positive changes at the clinic, the project leader performed a Poster Presentation at the clinic to inspire the providers and a health coach to refer more diabetic patients to DSME by showing them the findings of the project. A health coach could be a designated person to track the referral rate and to remind the providers to keep increasing referrals to diabetes education. This project was formally presented at the ECU College of Nursing. A submission of publication to nursing journals and podium presentations at the conference will be considered. Additional projects could be developed to examine how to increase the providers' attendance of educational sessions and how to increase diabetes patients' attendance of DSME classes and one-to-one individual sessions with a health coach. To further increase the referral rate, the project leader would recommend performing several educational sessions instead of one session, so all the providers had an opportunity to attend the session. In addition, for the providers who could not attend the session and received a PowerPoint presentation via email, the project leader would suggest to ask for their feedback, including what could be done to make an educational session more informative and useful.

### **Final Summary**

The goal of this project was to increase the number of patients' referrals to diabetes education. This goal was achieved through application of current best evidence from high-quality clinical research to improve diabetic patients' quality of care. By identifying a knowledge gap

(an insufficient provider awareness regarding efficacy of diabetes education), performing literature review and appraising research for validity, reliability, and applicability (search for evidence-based articles), applying research findings to clinical practice (an educational session performed in a private non-profit clinic at Eastern North Carolina), and evaluating the EBP process and assessing its impact to clinical practice (analysis and dissemination of findings to improve clinical outcomes of diabetic patients), this QI project made a small contribution to a decrease in “know-do gap” – the difference between the best evidence and a routine patient care.

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adherence. *Primary Care Diabetes*, 11, 162-170. doi: 10.1016/j.pcd.2016.10.005

## Appendix A

## Evidence Matrix

Table 1

*Evidence Matrix*

<b>Student:</b>	<b>Course:</b>	<b>Faculty Lead:</b>	<b>Date:</b>	<b>Project:</b>
<b>Article (APA Citation)</b>	<b>Level of Evidence (I to VII)</b>	<b>Data/Evidence Findings</b>	<b>Conclusion</b>	<b>Use of Evidence in EBP Project Plan (Include your evaluation, strengths/limitations, and relevance)</b>

<p>Powers, M.A., Barsley, J., Cypress, M., Duker, P., Funnell, M.M., Fischl, A.H., Maryniuk, M.D., Siminario, L., &amp; Vivian, E. (2015). Diabetes self-management education and support in type 2 diabetes: A joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. <i>DS-ME Support in Diabetes, XX(X)</i>, 1-12. The goals of the position statement are to improve the patient experience of care and education, the health of individuals and populations, and to reduce diabetes-associated health care costs.</p>	IV	<p>DS-ME/S has been shown to be cost-effective by reducing hospital admissions and readmissions, lifetime health care costs related to a lower risk for complications. DS-ME/S improves hemoglobin A1C by as much as 1% in people with type 2 diabetes. It is reported to reduce the onset and/or advancement of diabetes complications, to improve quality of life and lifestyle behaviors, to enhance self-efficacy and empowerment, to increase healthy coping, and to decrease the presence of distress and depression.</p>	<p>Diabetes is a complex disease that requires the person with diabetes to make numerous daily decisions regarding food, physical activity, and medications necessitating the proficiency in a number of self-management skills. DS-ME is critical in teaching the skills necessary for effective self-management and in laying the foundation with ongoing support to maintain gains made during education.</p>	<p>Inform the providers that DS-ME/S reduces hospital admissions and health care costs by lowering risk for complications, improves hemoglobin A1C, quality of life, and coping, and reduces diabetes-related distress and depression.</p>
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<p>Chomko, M.E., Odegard, P.S., &amp; Evert, A.B. (2016). Enhancing access to diabetes self-management education in primary care. <i>The Diabetes Educator</i>, 42(5), 635-645.</p> <p>To improve access to diabetes self-management education (DS-ME) and to evaluate the impact on glycemic and weight control.</p>	V	<p>Primary care clinics (PCCs) DS-ME was associated with increased enrollment in DS-ME classes and a significant reduction of A1C and weight in 3- and 6-months post-DS-ME. Greatest A1C and weight reduction were observed in patients with newly diagnosed diabetes. Reductions were also seen in patients with diabetes duration = or &gt;10 years, taking insulin, and those with depression.</p>	<p>PCC DS-ME availability increased access to group diabetes education and resulted in reduced A1C and weight for participants. This model was successful in translating an established academic accredited DS-ME-ERP into a PCC.</p>	<p>Inform the providers that attending the DS-ME program resulted in statistically significant reduced A1C and weight. A decrease in A1C of -1.1% (<math>p &lt; .00001</math>) was observed in 3 months post diabetes class. This A1C-lowering effect was observed to be sustained to -0.7% throughout = or &gt; 6 postclass on average; this change continued to be statistically significant. A significant (<math>p &lt; .01</math>) weight reduction of 1.6 mg at 3 months postclass was noted. At = or &gt; 6 months postclass, the participants continued to weigh significantly less (<math>p &lt; .015</math>) than before class intervention (Chomko, Odegard, &amp; Evert, 2016).</p> <p>This project is generalizable to other practices that already have an affiliation with existing diabetes education programs.</p> <p><b>Strengths:</b> This project supports the new model of primary care and diabetes management incorporating team-based care and care management in addition to the traditional patient-physician relationship.</p> <p><b>Limitations:</b> A relatively small sample. Outcomes data relied on the class participants and their providers to schedule an A1C laboratory draw within the 3 months after the intervention was completed. Nearly 25% of post intervention data were lost because A1C measurement occurred outside the 3-month window of class series completion. Since exclusion criteria eliminated patients who did not have postclass A1C data, the findings may be biased towards more adherent patients who returned for follow-up visits. Another limitation that was evaluated was the potential effect of medications on A1C and weight outcomes.</p>
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<p>Pillay, J., Armstong, M.J., Butalia, S., Donovan, L.E., Sigal, R.J., Bandermeer, B., ...Dryden, D.M. (2015). Behavioral programs for type 2 diabetes mellitus: A systematic review and network meta-analysis. <i>Annals of Internal Medicine</i>, 163(11), 848-860.</p> <p>To identify factors moderating the effectiveness of behavioral programs for adults with type 2 diabetes.</p>	I	<p>It had been found that most lifestyle and DS-ME plus support programs led to clinically important improvements in glycemic control (= or &gt; 0.4% reduction in HbA1C).</p>	<p>Diabetes self-management education offering = or &gt; than 11 contact hours led to clinically important improvement in glycemic control. Behavioral programs seem to benefit persons with suboptimal or poor glycemic control more than those with good control. Programs tailored to ethnic minorities seem to be beneficial. Programs that were effective included in-person delivery rather than incorporation of technology.</p>	<p>Inform the providers that DS-ME plus support programs let to clinically important improvement in glycemic control (= or &gt; 0.4% reduction in HbA1C).</p> <p><b>Limitations:</b> All trials had medium or high risk of bias. Subgroup analyses were indirect, and therefore exploratory. Most outcomes were reported immediately after the interventions.</p>
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<p>Beck, J., Greenwood, D.A., Blanton, L., Bollinger, S.T., Butcher, M.K., Condon, <del>J.E.,...</del>J.E., Wang, J. (2017). 2017 National Standards for diabetes self-management education and support. <i>The Diabetes Educator</i>, 44(1), 35-50.</p> <p>To review the literature for Diabetes Self-Management Education and Support (DS-MES) to ensure the National Standards for DS-MES (Standards) align with current evidence-based practices and utilization trends.</p>	VII	<p>Diabetes Self-Management Education and Support facilitates the knowledge, skills, and ability necessary for diabetes self-care and activities that assist a person in implementing and sustaining the behaviors needed to manage their condition on an ongoing basis. The evidence indicates that health care providers and patients affected by diabetes utilize technology, and this has a positive impact on DS-MES access, utilization, and outcomes.</p>	<p>DS-MES continues to be a critical element of care for all patients with diabetes. The DS-MES services must be individualized and guided by the concerns, preferences, and needs of the persons affected by diabetes. DS-MES continues to be underutilized, but technology is changing the way DS-MES is delivered and utilized with positive outcomes.</p>	<p>Educate providers that numerous studies have shown the benefits of DS-MES, which include improved clinical outcomes and quality of life while reducing hospitalizations and health care costs. Inform providers that engagement in DS-MES services improves A1C by 0.6% as much as many medications, with no side effects. Greater A1C improvement was associated with DS-MES services &gt; 10 hours.</p>
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<p>Mays, L. (2015). Diabetes mellitus standards of care. <i>Nursing Clinics of North America</i>, 50(4), 703-711. To describe Diabetes Mellitus Standards of Care.</p>	VII	<p>Care of the patient with diabetes can be complex and requires an interdisciplinary approach with an active patient role. Diabetes self-management education is a necessary and reoccurring part of effective management of diabetes.</p>	<p>Diabetes self-management education needs to be individualized, comprehensive, and frequently reinforced. Lifestyle changes necessary to manage diabetes should be personalized to the individual patient's lifestyle, health-related behaviors, and medical conditions. Evidence-based guidelines related to diabetes care need to be utilized for an effective management of patients with diabetes.</p>	<p>Inform providers that diabetes self-management education is a necessary and reoccurring part of effective management of diabetes.</p>
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<p>Rosa, M.A., Lapides, S., Hayden, C., &amp; Santangelo, R. (2014). The interdisciplinary approach to the implementation of a diabetes home care disease management program. <i>Home Healthcare Nurse</i>, 108-114.</p> <p>To describe a diabetes home care disease management program.</p>	VII	<p>Effective diabetes self-management is dependent upon a person's current lifestyle and require the person to make numerous behavioral changes for success. The American Association of Diabetes Educators (AADE) is a multidisciplinary association empowering healthcare professional to deliver exceptional diabetes care. Effective disease management requires collaboration of an interdisciplinary team, a focus on prevention, patient and caregiver self-empowerment, psychosocial support, and use of evidence-based practices.</p>	<p>The more confident and knowledgeable clinicians are, the more likely they are to empower patients. The hospital verbalize confidence referring patients to disease management program that can make a significant difference in clinical outcomes.</p>	<p>Inform providers about the importance of ongoing education and provide them updated information.</p>
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<p>Schinckus, L., Broucke, S., Housiaux, M. (2014). Assessment of implementation fidelity in diabetes self-management education programs: A systematic review. <i>Patient Education and Counseling</i>, 96, 13-21. To review the literature on implementation fidelity (IF), the degree to which programs are delivered as intended, as a factor influencing the effectiveness of diabetes education.</p>	V	<p>From an initial 418 abstracts, 20 published papers were retained for an in-depth analysis focusing on the components of implementation fidelity (IF). Intervention content was mainly assessed through observation whereas implementation dose was more often observed through self-report measures. Only one study addressed the relationship between IF and intervention effectiveness.</p>	<p>Self-management education is currently standard of medical care in diabetes. There is ten standards of DSM education, three of them related to facilitating strategies to improve the IF: documenting organizational structure, mission statement and goals to provide a solid basis to deliver quality diabetes education, the presence of a designated coordinator to ensure that diabetes education is delivered through a coordinated and systematic process, regular continuing education for providers.</p>	<p>Inform providers that in order to deliver quality diabetes education a coordinated and systematic process and ongoing continuing education for providers are required.</p> <p><b>Limitations:</b> The small sample of the review due to the restriction of the search terms, the limited number of articles that met all the inclusion criteria that makes it difficult to draw far-reaching conclusions from the content analyses, an inadequate representation of the variety of existing DSM programs, and a lack of a unanimously agreed-upon framework regarding IF concept.</p> <p><b>Relevance:</b> The results of this review suggest that reports on DSM education should systematically describe how the program was implemented.</p>
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<p>Wu, J., Davis-Ajami, M.L., Noxon, V., &amp; Lu, Z.K. (2017). Venue of receiving diabetes self-management education and training and its impact on oral diabetic medication adherence. <i>Primary Care Diabetes, 11</i>, 162-170.</p> <p>To determine predictors associated with the diabetes self-management education and training (DS-ME) venue and its impact on oral antidiabetic (OAD) medication adherence.</p>	VI	<p>Of the 2119 respondents, 41.6% received DS-ME from multiple venues. Age (&lt;65 years), education-level (college or higher), high-income, and diet modification were significantly more likely associated with receiving DS-ME from multiple venues. In single vs multiple venues, medication adherence was suboptimal (mean MPR 0.66 vs 0.64, <math>p=0.245</math>), and venue showed no influence on adherence (OR: 0.92, 95% CI, 0.73-1.16).</p>	<p>Sociodemographic characteristics influence where adults with diabetes receive DS-ME. Adding different DS-ME venues may not address suboptimal OAD medication adherence.</p>	<p>Inform providers that due to the multi-faceted nature of diabetes self-management, an integrated approach is needed to enhance self-care among patients with diabetes to achieve improved outcomes. Physicians and health care professionals are well positioned resource for information about disease management and DS-ME.</p> <p><b>Limitations:</b> Observational research design using the secondary data source limits the findings. The findings cannot suggest causality and should be interpreted in light of the DS-ME literature, diabetes practice guidelines, and individualized patient outcomes. Another limitation was that a cross-sectional design provided a snapshot over a short time span and long-term effects about how the venue for DS-ME affected medication adherence could not be assessed. Third, the study did not provide information about educational materials, patient provider interactions, and patient satisfaction with DS-ME. Fourth, medication adherence was measured using pharmacy record limiting an ability to determine if respondents took their medications. Finally, the study did not provide laboratory data limiting an ability to assess glucose control.</p>
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<p>American Diabetes Association (2019). Standards of medical care in diabetes. <i>The Journal of Clinical and Applied Research and Education</i>, 42(1), S1-S193. Retrieved from <a href="http://care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf">http://care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf</a></p>	VII	<p>The 2019 Standards of Medical Care in Diabetes includes all of ADA's current clinical practice recommendations and is intended to provide clinicians with the components of diabetes care, general treatment goals, and tools to evaluate the quality of care.</p>	<p>The recommendations are based on an extensive review of the clinical diabetes literature, supplemented with input from ADA staff and the medical community at large.</p>	<p>Inform the providers that ADA (2019) recommends that all people with diabetes should participate in diabetes self-management education to facilitate the knowledge, skills, and ability necessary for diabetes self-care and all individuals with diabetes should be offered a referral for individualized MNT [Medical Nutrition Therapy] provided by a registered dietitian (RD).</p> <p><b>Relevance:</b>  ADA (2019) Standards of medical care in diabetes emphasized the importance of Diabetes Self-Management Education and Medical Nutrition Therapy to improve clinical outcomes in patients with diabetes.</p>
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<p>Wong, C.K.H., Wong, W.C.W., Lam, C.L.K., Wan, Y.F., Wong, W.H.T., Chung, K.L., Fong, D.Y.T. (2014). Effects of patient empowerment programme (PEP) on <del>clinical</del> clinical outcomes and health service utilization in type 2 diabetes mellitus in primary care: An observational matched cohort study. <i>PLOS ONE</i>, 9(5), 1-10.</p> <p>To evaluate the effects of a large population-based patient empowerment programme (PEP) on clinical outcomes and health service utilization in type 2 diabetes mellitus in primary care:</p>	VI	<p>Compared with non-PEP, PEP group achieved additional improvement in clinical outcomes over the 12-month period. A significantly greater percentage of patients in the PEP group attained HbA1c &lt; or = 7% or LDL-C &lt; or = 2.6 mmol/L at 12-months follow-up compared with the non-PEP group.</p>	<p>PEP was effective in improving the clinical outcomes and reduced the general outpatient clinic utilization rate over a 12-month period. Empowering T2DM patients on self-management of their disease can enhance the quality of diabetes care in primary care.</p>	<p>Inform providers that patient empowerment is “a process where people gain greater control over decision affecting their health.” This principle is to enable patients to be the primary decision maker in managing their condition, based on the motions that patients are more motivated to initiate and sustain behavioral changes of their choice than changes prescribed by others. This approach requires a collaborative relationship between the patient and the healthcare provider who facilitates the patient in making informed decisions by providing necessary resources. By referring the patient to DS-ME classes that enrich the patient’s knowledge regarding diabetes, the provider assists the patient in making informed decisions.</p> <p><b>Limitations:</b> First, patients participated in the study might be those who were more motivated and proactive in seeking support. Second, some patients in the PEP group might be receiving co-intervention, such as multi-disciplinary risk assessment and management programme, in addition to PEP during the study period. Third, the control subjects might not be matched to cases by all potential confounders. It cannot be excluded that some control subjects were in secondary care.</p> <p><b>Relevance:</b> The study provided a translational evidence of diabetes self-management education in the real-world setting.</p>
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<p>Martin, A.L., Warren, J.P., &amp; Lipman, R.D. (2013). The landscape for diabetes education: Results of the 2012 AADE National Diabetes Education Practice Survey. <i>The Diabetes Educator</i>, 39(5), 614-622.</p> <p>The National Member Practice Survey (NPS) of the American Association of Diabetes Educators (AADE) is conducted biannually to describe the current diabetes education practice in the United States and identify trends, opportunities, and areas for improvement.</p>	VI	<p>The nurses and dietitians continued to comprise the majority of diabetes educators in 2012. There is an increase in the respondents identified as pharmacists compare with 2010. Nearly 53% of educators indicated they devoted more than 4 hours per week to data entry, significantly higher than any other amount of time. About 77% of all respondents held the certified diabetes educator (CDE) credential, decreasing slightly from 2010.</p>	<p>Results of the 2012 NPS provide evidence that the practice of diabetes education is continuing to adapt to evolving models of health care in the United States by expanding the mix of practitioners providing education, engaging in necessary system support activities, and broadening the range of patients seen to include individuals at risk of developing diabetes.</p>	<p>Inform providers that successful outcomes in diabetes depends on effective self-management, making diabetes self-management education (DS-ME) a critical part of diabetes care. Compared with a decade ago, DS-ME today takes on even greater significance because the dramatically rising prevalence of diabetes poses growing health and economic burdens.</p> <p><b>Limitations:</b> A major limitation of this study was the constrained scope of the survey sampling, which was limited to AADE members. It is not possible to determine from the data obtained in this survey whether the proportion of credentialed diabetes educators among health care professionals specializing in diabetes education is changing.</p>
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<p>Levesque, C. (2017). Therapeutic lifestyle changes for diabetes mellitus. <i>Nursing Clinics of North America</i>, 52,679-692.</p>	VI	<p>Diabetes self-management education and diabetes self-management support (DS-ME/S) helps to empower patients with diabetes to make informed decision by providing the knowledge and skills to manage blood glucose and other diabetes-related conditions (hyperlipidemia and hypertension). DS-ME/S programs have been found to reduce the readmission rate of diabetes patients with poor glycemic control.</p>	<p>Therapeutic lifestyle changes are fundamental to achieve treatment targets, minimize the use of diabetes medications, and reduce the risk of comorbid conditions and psychological distress. Diabetes education and support, provided by diabetes specialists, is vital to successful self-management of diabetes.</p>	<p>Educate providers that there are four key times when patients with diabetes need DS-ME/S: at the time of diagnosis, annually for an educational needs assessment/teaching, at the time of occurring new issues, such as new diabetes-related complications, changes in glycemic control, emotional factors, physical or mental inability to care for self, and the time of transitions of care. Inform providers that the current evidence shows that DS-ME/S programs are reducing the readmission rate of diabetes patients with poor glycemic control.</p>
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<p>Sherifali, D. (2017). Diabetes coaching for individuals with type 2 diabetes: A state-of-science review and rationale for a coaching model: Review article. <i>Journal of Diabetes, 9</i>, 547-554.</p> <p>To examine the literature to provide an evidence-based model of diabetes coaching, comprising self-management education, case management, behavior change, and psychosocial support, to identify implementation and evaluation measures, and opportunities to implement technology to facilitate coaching.</p>	I	<p>A growing body of evidence suggests that patients achieve better health outcomes with health coaching than with traditional education and support programs. Health coaching has emerged from motivational interviewing techniques and has been described as helping the patients their goals by facilitating the learning process within a framework of behavioral change. Health coaches support patients by increasing their motivation and enhancing self-efficacy, reducing barriers to taking action, promoting problem solving skills, and providing valuable feedback.</p>	<p>The diabetes coaching model includes: personal case management and monitoring, diabetes self-management education and support, behavior modification, goal setting and reinforcement, using motivational interviewing and theories to facilitate goal setting, attainment, and behavior change, and psychosocial support, combining active listening and empathy to provide support.</p>	<p>Educate providers that delivery of curriculum should be based on individual needs. Health coach assess the patients to identify goals for participant and to tailor the curriculum to match individual's age, developmental stage, type of diabetes, culture, health literacy, and comorbidities.</p> <p><b>Strengths:</b> This is a first comprehensive evidence-based review of diabetes coaching utilizing a complex health service interventions checklist to provide a definition of diabetes coaching. In addition, rigorous systematic review procedures, such as comprehensive search strategies and citation screening and data extraction in duplication, were utilized. Finally, this study described in details the components of diabetes coaching.</p> <p><b>Limitations:</b> Only studies published in English, those demonstrated clinical or statistical significance for coaching were included. The study is limited in the reporting of patient-relevant outcomes in the literature, such as quality of life and/or self-efficacy.</p>
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<p>Lepard, M.G., Joseph, A.L., Agne, A.A., &amp; Cherrington, A.L. (2015). Diabetes self-management interventions for adults with type 2 diabetes living in rural areas: A systematic literature review. <i>Current Diabetes Reports</i>,15(37), 1-12.</p>	I	<p>It had been found that both face-to-face and telehealth interventions resulted in improved behavioral, biologic and diabetes knowledge-related outcomes in adults with T2DM living in rural areas.</p>	<p>Rural communities have high rate of diabetes due to lack of access to diabetes education and clinical services, limited cell phone coverage and internet access, limited transportation and long travel distances, and higher rates of poverty. Health systems are increasingly employing new strategies to take expertise necessary to provide diabetes self-management education into rural communities. Both in-person DS-ME and telehealth interventions have the potential to be effective for patients with T2DM in rural areas.</p>	<p>Inform providers that both in person DS-ME and telehealth have the potential to be effective for diabetes-related outcomes in rural areas.</p> <p><b>Limitations:</b> The limitations of this study include challenges comparing data from different studies, potential publication bias, and inability to ensure that all relevant literature was identified. The interventions reviewed were of varying lengths, focused on a variety of outcomes, and were designed for various cultural groups, making comparison across studies difficult. One possible reason for lack of significant improvement in HbA1c and BMI/weight in shorter interventions may be inadequate length to follow up for these long-term measures of metabolic control.</p>
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<p>Winkley, K., Upsher, R., Keij, S.M., Chamley, M., Ismail, K., &amp; Forbes, A. (2018). Research: Educational and psychological aspects healthcare professionals' views of group structured education for people with newly diagnosed type 2 diabetes. <i>Diabetes Medicine</i>, 35, 911-919.</p> <p>To determine healthcare professionals' (HCP) views of group structured education for people with newly diagnosed type 2 diabetes.</p>	VI	<p>All but one HCP viewed diabetes education favorably and all identified that low attendance was a problem. It had been found that benefits of diabetes education were improved patient outcomes and saving HCPs' time. The factors limiting uptake of education were access and the appropriateness of the programme for certain groups, the difficulties communicating the benefits to patients and integration of education management plans into ongoing diabetes care. Strategies to improve attendance were offered, such as follow-up sessions and support for people with pre-existing psychological issues.</p>	<p>Most HCPs valued diabetes education and all highlighted the lack of strategies for people with different levels of health literacy. Future studies need to focus on helping HCPs encourage their patients to attend.</p>	<p>Inform providers that DS-ME improved patient outcomes and saving HCPs' time.</p> <p><b>Strengths:</b> The strengths of the study were that a large pilot interview was conducted prior to the majority of the interviews to determine which HCPs were involved in referring people to DESMOND course.</p> <p><b>Limitations:</b> Limitations of the study included a different topic guide being used for individual and group interviews to reduce the time burden on the groups. Another limitation, that after the initial pilot interview with a variety of general practitioners, subsequent interviews involved nurses only.</p>
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<p>Brown, S.A., Garcia, A.A., Brown, A., Becker, B.J., Conn, V.S., Ramirez, G., ...Cuevas, H.E. (2016). Biobehavioral determinants of glycemic control in type 2 diabetes: A systematic review and meta-analysis. <i>Patient Education Counseling</i>, 99(10), 1558-1567.</p> <p>To conduct a model-driven meta-analysis of correlational research on psychological and motivational predictors of diabetes outcomes, with adherence factors as mediators.</p>	I	<p>Results varied according to the outcome variable included in the regression models. Depression had a larger negative effect on adherence to physical activity than on dietary adherence. Coping and self-efficacy were strongly related to dietary adherence, which was strongly related to improved glycemic control. Medication adherence was related to glycosylated hemoglobin, whereas medications and self-monitoring were related to fasting blood glucose. Adding appointment keeping to the models did not significantly alter the results.</p>	<p>Self-efficacy was the most consistent predictor of all adherence behaviors and dietary adherence was the most significant predictor of HbA1c. Physical activity was the most predictive factor of BMI and glucose self-monitoring the most predictive of FBG.</p>	<p>Educate providers that self-efficacy was the most consistent predictor of all adherence behaviors and dietary adherence was the most significant predictor of HbA1c.</p> <p><b>Strengths:</b> One of the main strengths of this review was that it involved a thorough quantitative synthesis of the literature relative to one of the most pressing problems facing society today, diabetes associated with growing rates of obesity.</p> <p><b>Limitations:</b> Publication bias is a potential threat to any systematic review and relates to the fact that statistically significant research findings are more likely to be published than are non-significant results. Therefore, published research may not be representative of the entire body of literature on a given topic</p>
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<p>Jones, K.E., Yan, Y., Colditz, G.A., &amp; Herrick, C.J. (2018). Prenatal counseling on type 2 diabetes risk, exercise, and nutrition affects the likelihood of postpartum diabetes screening after gestational diabetes. <i>Journal of Perinatology</i>, 38(4), 315-323.</p> <p>To determine how prenatal counseling on exercise, nutrition, and type 2 diabetes risk affects postpartum screening for diabetes.</p>	VI	<p>Among 556 women, prenatal counseling was associated with increased postpartum diabetes screening, after adjusting for age; parity; and receipt of Women, Infants, and Children (WIC) benefits (adjusted odds ratio (AOR) 3.0 [95% CI 1.4–6.5]). This effect was modified by race/ethnicity. Primiparity (AOR 2.2 [95% CI 1.2–4.1]) and advanced maternal age (AOR 2.2 [95% CI 1.2–3.8]) were associated with increased screening, and receiving WIC benefits was associated with decreased screening (AOR 0.5 [95% CI 0.3–0.9]).</p>	<p>In women with gestational diabetes, culturally appropriate counseling on future diabetes risk, nutrition, and exercise may enhance postpartum diabetes screening.</p>	<p>Educate providers that <del>Latin</del> women with gestational diabetes, culturally appropriate counseling on future diabetes risk, nutrition, and exercise may enhance postpartum diabetes screening.</p> <p><b>Strengths:</b> Population diversity and size as well as the number of different counseling topics assessed.</p> <p><b>Limitations:</b> Recall bias, an inability to conclude that there is a causal relationship between recall of counseling and higher screening rates, the limitation in assessing variables collected in the PRAMS, an inability to evaluate potentially important cofounders, such as type and treatment of gestational diabetes, timing of gestational diabetes diagnosis, content and frequency of counseling, and credentials of the counselor, a limited ability to assess the effect modification of race/ethnicity on counseling and postpartum screening due to a lack of data on others factors of acculturation, and the lower association between counseling and screening in the Hispanic population due to language barriers.</p>
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<p>American Diabetes Association. (2018). <i>The burden of diabetes in North Carolina</i>. To provide statistics in North Carolina's diabetes epidemic.</p>	VII	<p>Approximately 1,075,855 people in North Carolina, or 13.1% of the adult population, have diabetes. In addition, 2,624,000 people in North Carolina, 36.1% of the adult population, have prediabetes with blood glucose levels higher than normal, but not yet high enough to be diagnosed as diabetes. Every year an estimated 53,000 people in North Carolina are diagnosed with diabetes. Diabetes and prediabetes cost an estimated \$10.9 billion in North Carolina each year.</p>	<p>Diabetes is growing at an epidemic rate in the United States. According to the Center for Disease Control and Prevention (CDC), nearly 30 million Americans have diabetes and face its consequences. What's true nationwide is also true in North Carolina.</p>	<p>Educate providers that diabetes and prediabetes cost an estimated \$10.9 billion in North Carolina each year. Therefore, diabetes self-education that improves diabetes related outcomes is important to reduce health care cost.</p>
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<p>Azar, K.M.J, Chung, S., Wang, E.J., Zhao, B., Linde, R.B., Lederer, J., &amp; Palaniappan, L.P. (2015). Impact of education on weight in newly diagnosed type 2 diabetes: Every little bit helps. <i>PLOS ONE</i>, 1-11. To evaluate the benefit of participation in more limited counseling and/or education among patients with newly diagnosed type 2 diabetes in more modest real-world clinical settings.</p>	I	<p>Of the total cohort, 599 (45.6%) patients received counseling/education with (26.2%) and without (19.4%) medication, 298(22.7%) patients received a prescription for medication alone, and 417(31.7%) patients were only monitored. On average, those who participated in counseling/education attended 2.5 sessions (approximately 2–3 hours). The average weight loss of patients who received counseling/education alone during the follow-up period (up to three years post-exposure to participation) was 6.3 lbs. (3.3% of body weight), and, if received with medication prescription, 8.1lbs. (4.0% of body weight) (all at <math>P&lt;0.001</math>). The weight loss associated with medication was only 3.5 lbs. (<math>P&lt;0.001</math>). No significant weight change was observed in the monitoring only group</p>	<p>While efforts to improve both the short-term and long-term effectiveness of behavioral lifestyle interventions in real-world settings are ongoing, it is important for clinicians to continue to utilize less intensive, existing resources. Even relatively small “doses” of health education may help in promoting weight loss and may potentially reduce cardiometabolic risk.</p>	<p>Educate providers that even a small dose of education helps in promoting weight loss and risk reduction. Individuals who are newly diagnosed with type 2 diabetes may be particularly receptive to learning about how to self-manage their type 2 diabetes and even potentially partially reverse it through behavioral lifestyle change. It is important for clinicians to refer individuals for formal counseling with a dietician or a structured class to gain further understanding of how their current behaviors may impact their type 2 diabetes status.</p> <p><b>Limitations:</b></p> <p>The possibility of selection bias, the lack of examination of adherence to medication and patient-initiated lifestyle modifications.</p>
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<p>Speight, J., &amp; Deakin, T. (2016). How can we improve uptake of structured diabetes education? <i>DigestDebate. 15(2/3)</i>, 76-77.</p>	VII	<p>Services should be delivered by trained, competent and quality-assured educators who can communicate using simple language and visual aids, build rapport and enable informed decisions. Referring agents need to be familiar with the content and delivery of the education package. Outcomes should be recorded and analyzed to ascertain effectiveness. There should be patient choice over when to attend, with courses available at different times of the day. Venues should be easily accessible.</p>	<p>Traditional NHS services have not always been flexible to meet the needs of the user, but if we want people with diabetes to utilize and benefit from structured education, putting them at the heart of the service is key.</p>	<p><u>Educat</u> –Educate providers that programmes need to be between six and ten sessions, with a minimum of 12 hours, to be effective.</p>
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<p>Horigan, G., Davies, M., Findlay-White, F., Chaney, D., &amp; Coates, V. (2017). Reason why patients referred to diabetes education programmes choose not to attend: A systematic review. <i>Diabetic Medicine</i>, 34 (1), 14-26. To identify the reasons why those offered a place on diabetes education programmes declined the opportunity.</p>	I	<p>A total of 12 studies quantitative and qualitative methodologies were included. The selected studies were published in Europe, USA, Pakistan, Canada and India, with a total sample size of 2260 people. Two broad categories of non-attender were identified: those who could not attend for logistical, medical or financial reasons and those who would not attend because they perceived no benefit from doing so, felt they had sufficient knowledge already or had emotional and cultural reasons. Diabetes education was declined for many reasons, and the range of expressed reasons was more diverse and complex than anticipated.</p>	<p>New and innovative methods of delivering diabetes education are required which address the needs of people with diabetes whilst maintaining quality and efficiency.</p>	<p>Educate providers that more patient-centered developments need to be made to improve attendance of diabetic classes.</p>
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<p>Canada, A.N. (2016). Probing the relationship between evidence-based practice implementation models and critical thinking in applied nursing practice. <i>The Journal of Continuing Education in Nursing</i>, 47(4), 161-168.</p> <p>To discuss the relationship between critical thinking and the current evidence-based implementation models.</p>	VII	<p>The evidence-based practice's application and sustainability is inconsistent in nursing practice. Despite the expansion of efforts to teach evidence-based practice and practically apply evidence at the bedside, a research-practice gap still exists. Implementing EBP into practice includes: developing clinical inquiry, determining a clinically relevant question, searching and collecting evidence, critically appraising the evidence, integrating the best evidence with respect to clinical expertise and patient preferences, evaluating the outcomes of decisions, and disseminating the outcomes of the implemented changes to the appropriate evidence. The most well known EBP implementation models are the Advancing Research and Clinical Practice Through Close Collaboration (ARCC) model, the ACE Star model of knowledge translation, the Iowa model, the Promoting Action on Research Implementation in Health Services Framework, the Stetler model, and Johns Hopkins nursing evidence-based practice model.</p>	<p>EBP improves patient outcomes through safe, quality health care at reduced cost throughout the health care system. It is necessary to foster a culture in which EBP is the standard. Critical thinking is a key component in the learning and implementation of EBP, as demonstrated by its presence and integration in EBP implementation models.</p>	<p>Educate providers that the John Hopkins nursing evidence-based practice model emphasizes change at the organizational level for translating research into practice. It consists of 3 major steps: the identification of a relevant practice question, the collection, synthesis, and evaluation of collected evidence, and the application of evidence in practice. This model provides clear measures to evaluate the level and quality of evidence.</p> <p><b>Relevance:</b> Consistent implementation of evidence-based practice (EBP) is important in health care, as it promotes patient safety, improves quality of care, and reduces costs throughout the health care system. Critical thinking is a contributing factor to the successful implementation of EBP, as evidenced by its integration in current EBP implementation models.</p>
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<p>Schaffer, M.A., Sandau, K.F., &amp; Diedrick, L. (2012). Evidence-based practice models for organizational change: Overview and practical applications. <i>Journal of Advanced Nursing</i>, 69(5), 1197-1209.</p> <p>To provide an overview, summary of key features and evaluation of usefulness of six evidence-based practice models.</p>	I	<p>Authors described model key features and provided an evaluation of model usefulness based on specific criteria, which focused on facilitating the evidence-based practice process and guiding practice change.</p>	<p>The Johns Hopkins Model emphasize the processes of funding and evaluating evidence. An evidence-based practice model that is clear to the clinician and fits the organization will guide a systematic approach to evidence review and practice change.</p>	<p>Educate providers that the Johns Hopkins Model Emphasize the processes of funding and evaluating evidence.</p> <p><b>Limitations:</b> The process used to identify EBP models for discussion, although systematic, may have resulted in overlooking models with potential for application to practice. The discussion of EBP models and application in practice is not exhaustive; more in-depth discussion is provided by other.</p> <p><b>Relevance:</b> The evaluation of model usefulness can be used to determine the best fit or the models to the practice setting.</p>
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<p>Marincic, P.Z., Hardin, A., Salazar, M.V., Scott, S., Fan, S.X., &amp; Gallard, P.R. (2017). Diabetes self-management education and medical nutrition therapy improve patient outcomes: A pilot study documenting the efficacy of registered dietitian nutritionist interventions through retrospective chart review. <i>Journal of the Academy of Nutrition and Dietetics</i>, 117(8), 1254-1264. doi: 10.1016/j.jand.2017.01.023</p>	I	<p>Significant weight loss was observed from baseline (94.3±21.1 kg) to end of program (91.7±21.2 kg [-1.6±3.9 kg]; P&lt;0.001); weight loss in whites (-5.0±8.4 kg; P&lt;0.001) exceeded that of African Americans (-0.8±9.0 kg; P&gt;0.05). Significant hemoglobin A1c reduction was observed from baseline (8.74%±2.30%) to end of program (6.82%±1.37% [-1.92%±2.25%]; P&lt;0.001) and retained at 1 year (6.90%±1.16%; P&lt;0.001). Comparatively, 72% of patients reached hemoglobin A1c targets (≤7.0%) vs 27% at baseline (P=0.008). When stratified by diet alone and diet plus drug therapy, patients exhibited a 1.08%±1.20% (P&lt;0.001) and 2.36%±2.53% (P&lt;0.001) reduction in hemoglobin A1c, respectively. Triglycerides decreased from baseline 181.6±75.5 mg/dL (2.0±0.9 mmol/L) to 115.8±48.1 mg/dL (1.3±0.5mmol/L) (P=0.023). High-density lipoprotein increased from 41.4±12.4 mg/dL (1.1±0.3 mmol/L) to 47.3±12.4 mg/dL (1.2±0.3 mmol/L) (P=0.007).</p>	<p>Retrospective chart review provides an operational model for abstracting existing patient outcome data subsequent to registered dietitian nutritionist interventions. In support of universal reimbursement and patient access to DSME with supplemental individualized MNT, reductions were observed in key outcome measures weight, body mass index, hemoglobin A1c, and triglycerides.</p>	<p>Inform providers that Diabetes self-management education (DSME) and medical nutrition therapy (MNT) improve patient outcomes.</p> <p><b>Relevance:</b> The providers' education regarding the importance of DSME and MNT will increase the number of referrals to diabetes education and nutrition.</p>
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<p>Kawi, J. (2012). Self-management support in chronic illness care: A concept analysis. <i>Research and Theory for Nursing Practice</i>, 26(2), 108-125. This article reports on the concept analysis of self-management support (SMS) to provide clarity for systematic implementation in practice.</p>	I	<p>Based on the systematic literature review, three major attributes of SMS were identified: patient-centered attributes, provider-attributes, and organizational attributes in supporting patient SM in the context of chronic illness care.</p>	<p>Chronic illness is a costly, worldwide epidemic with a high mortality rate despite several preventable causes. To address chronic illnesses, SMS has been used to support patients toward engaging in healthy behavior in managing their chronic illness state. This concept analysis presented comprehensive approach in managing the complexity of chronic illnesses through multifaceted attributes at the patient-centered level, provider level, and organizational level.</p>	<p>Educate providers on the importance the patient-provider partnership, especially when there is resistance to SM and inadequate self-management strategies based on lack of knowledge or misinformation. Readiness to change is a product of interpersonal interaction and the complexity of chronic illness requires a proactive collaborative management.</p> <p><b>Limitations:</b> Some relevant references were not retrieved and the interpretations of authors in the reviewed studies were not comprehensively presented. The only 2 of the 70 reviewed publications were geared to research studies focused on the pediatric age group and 2 looked at different ethnicities. Thus, the SMS attributes cannot be generalized to the younger population or all ethnic groups.</p>
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<p>Novak, M., Constantini, L., Schneider, S., &amp; Beanlands, H. (2013). Approaches to self-management in chronic illness. <i>Seminars in Dialysis</i>, 26(2), 188-194.</p>	<p>VII</p>	<p>Management of a chronic medical condition is a complex process and requires coordinated action between healthcare providers and patients. Self-management involves active participation of the patients in the everyday care of the symptoms of their illnesses and medical treatments. The evidence has demonstrated that enhancing self-management, and reduces healthcare expenditures and service utilization. Better understanding of these concepts will facilitate patient-provider collaboration, improve patient care with increased patient satisfaction, and may result in better clinical outcomes and enhanced quality of life for both the patients and their families.</p>	<p>The future of health care should emphasize more active involvement of patients in the maintenance of their health in the context of chronic disease, prevention of disease progression, and management of chronic illnesses.</p>	<p>Educate providers that at the providers level, self-management support requires that healthcare team members have the time, knowledge, and expertise required to develop individualized plans of care. Comprehensive individual assessment regarding readiness to learn and change behavior, desire of the patient to be engaged in self-management should be performed initially and needs regular follow-up.</p>
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<p>Teoli, D., &amp; An, J. (2019). SWOT analysis. StatPearls, 1-3.</p>	<p>VII</p>	<p>SWOT analysis (strengths, weaknesses, opportunities, threats) is a business strategy tool to assess how an organization compares to its competition.</p>	<p>The concept of strategic fit can be explained as to how well the internally-related factors fit with the externally-related factors.</p>	<p><b>Strengths:</b> The SWOT analysis facilitates the formation of organizational strategy by assessing internal and external elements.</p> <p><b>Limitations:</b> The tool can be too superficial hindering performance as outputs might be misunderstood or misused, especially when SWOT analysis is attempted without real critical reflection by a collective group. The second limitation that organizations can anchor on one facet of the analysis, losing sight of the other critical elements of the matrix. The third limitation, that the SWOT captures the internal and external aspects of a single time-point, but, in reality, environment is rapidly evolving.</p> <p><b>Relevance:</b> As the level of health care organizations, implementation of SWOT is achievable by asking the questions: What are the organization’s advantages? Upon what factors could the organization improve? What good opportunities are available to your organization? What problems does your organization face?</p>
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<p>Donnelly, P., &amp; Kirk, P. (2005). Use the PDSA model for effective change management. <i>Education for Primary Care, 26</i>, 279-81.</p>	VII	<p>An effective change management model is Edward Deming's PDSA cycle that used to help teams improve the quality of care. Improving quality means making healthcare safer, more efficient, patient-centered, timely, effective, and equitable.</p>	<p>The key components of the PDSA model are: plan, do, study, act.</p>	<p><b>Relevance:</b>  The "plan" of PDSA cycle included the collection of baseline data regarding patients' referrals, planning of education session for the providers in primary care settings, and a computer card. The "do" involved providing education session to primary care providers regarding the importance of diabetes education and developing a computer card. The "act" ensured that improvements are implemented as planned. The "study" conducted to analyze whether the implemented interventions led to increase in patients' referrals. If benchmarks were achieved this cycle could be repeated using the same interventions and if benchmarks were not achieved new strategies could be developed to reach objectives.</p>
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<p>AACN, AACOM, AACP, ADEA, AAMC, ASPH (2011). <i>Core competencies for interprofessional collaborative practice: Report of an expert panel.</i></p>	<p>VII</p>	<p>The introduction and discussion of the four competency domains and the specific competencies within each form the core of the report</p>	<p>Interprofessional collaborative practice competency domains: values/ethics for interprofessional practice, roles/responsibilities, interprofessional communication, teams, and teamwork.</p>	<p><b>Strengths:</b> Report includes competency statements and targets a specific aspect of health professions training focused on relationships among professions and with patients using a community/population-orientation. The recognition that interprofessional learning contexts around specific healthcare and health improvement goals is a fundamental message of the report.</p> <p><b>Limitations:</b> The competencies identified in the report did not address the unique aspect of each health profession of the common clinical and public health knowledge base that health professionals share.</p> <p><b>Relevance:</b> An optimal use of the health professions workforce required a cooperative effort in the form of teams sharing common goals.</p>
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<p>Hodge, A.B., Preston, T.J., Fitch, J.A., Harrison, S.K., Hersey, D.K., Nicol, K.K., ...Galantowicz, M. (2014). Quality improvement methodologies increase autologous blood product administration. <i>The Journal of Extra-Corporeal</i> <i>Corporated Technology</i>, 46, 45-52.</p>	VI	<p>The U.S. Agency for Healthcare Research and Quality defined “quality” as “doing the right thing at the right time, in the right way, for the right person—having the best possible results.” Many QI tools have been successfully adapted from their use in the manufacturing industry to healthcare and management practices. This article described a PDSA cycle model that was used for improvement and testing of change. A PDSA cycle begins with a plan to test a small change or hypothesis (Plan); implementing the change (Do); observing, analyzing, and learning from the implementation (Study); and determining what additional modifications should be made (Act). The PDSA cycle is repeated as necessary with each iteration of the PDSA cycle being an expansion and/or enhancement of the previous cycle. PDSA cycles start in small areas and can grow to become unit or even hospital-wide with limitless potential to a national or global culmination</p>	<p>Quality improvement will involve change, but measuring of that change is <b>is</b> vital to the success of any project. Transparency and team involvement assisted with change management and collaboration with each member of the system. Allowing individuals to give feedback and input to the success of the QI initiative was beneficial and assisted with the success of this initiative. A multidisciplinary team led to success in improving care and provided momentum for future successes.</p>	<p><b>Relevance:</b> The PDSA cycle model was used in this project to improve diabetic patients’ clinical outcomes (See Donnelly, P., &amp; Kirk, P. (2005). Use the PDSA model for effective change management. <i>Education for Primary Care</i>, 26, 279-81).</p>
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<p>Melnyk, B.M., &amp; Fineout-Overholt, E. (2019). <i>Evidence based practice in nursing and healthcare: A guide to best practice</i>. (4 ed.) Philadelphia: Wolters Kluwer</p>	<p>VII</p>	<p>Although many published interventions/treatments have resulted in positive outcomes for patients and healthcare systems, they are not being implemented in clinical practice. Qualitative evidence also is not incorporated into care.</p>	<p>There are seven levels of evidence.</p>	<p><b>Strengths:</b></p> <p>Introduces the EBP paradigm, explains why rigorously following the steps of the EBP process is essential, clarifies misperceptions about implementing evidence-based care, and underpins practical action strategies that lead to sustainable evidence implementation at the point of care.</p> <p><b>Relevance:</b></p> <p>Provides information regarding levels of evidence that allows clinicians to appraise EBP resources.</p>
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<p>Mick, G. (2016). Referring your patients for diabetes self-management education (DSME) to improve patient outcomes. <i>ADA Symposium</i>, November 2018. Carmel, Indiana</p>	<p>VII</p>	<p>Identified issues to consider during diagnosing the patient with Type 2 DM, defined DSME/S and identified the benefits for providers and diabetic patients, described AADE seven self-care behaviors, and discussed the four critical times for assessing the need for a referral for DSME/S.</p>	<p>To enhance patient engagement, it is important to talk to the patients about the importance of self-management to achieve treatment and quality-of-life goals. DSME and ongoing support throughout a lifetime of diabetes is essential.</p>	<p><b>Relevance:</b> Diabetes Self-management Education and Support Algorithm with action steps was handed to providers and a health coach during educational session.</p>
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<p>Miller, W.R., Lasiter, S., Ellis, R.B., &amp; Buelow, J.M. (2015). Chronic disease self-management: A hybrid concept analysis. <i>Nursing Outlook</i>, 63, 154-161.</p>	V	<p>This article described the current conceptualization of CDSM in the literature, identified potential inadequacies in this conceptualization based on a comparison of literature- and patient-based CDSM descriptions, and offered a more comprehensive definition of CDSM.</p>	<p>CDSM is a complex process involving behaviors at multiple levels of a person's environment. Patients with chronic diseases must alter their CDSM based on sudden and acute exacerbation phases or their stable chronic condition. Pilot work to develop and test CDSM interventions based on both individual and external characteristics is needed.</p>	<p><b>Relevance:</b></p> <p>Educated providers that CDSM is a fluid, iterative process during which patients incorporate multidimensional strategies that meet their self-identified needs to cope with chronic disease within the context of their daily living. Strategies are multidimensional because they require the individual to incorporate intrapersonal, interpersonal, and environmental systems to maximize wellness. Successful management of both functioning in day-to-day life along with management of chronic illness requires the individual to continually monitor health and functional status and take appropriate actions during acute phases.</p>
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<p>Weyant, R.J. (2019). Teaching evidence-based practice: Considerations for dental education. <i>Dental Clinics of North America</i>, 63(1), 97-117.</p>	<p>VII</p>	<p>High-quality health care depends on evidence-informed decision making. Achieving that goal depends on effective EPB educational programs.</p>	<p>The five-step model of EBP described in Sicily Statement included: translation of uncertainty to an answerable question, systematic retrieval of best evidence available, critical appraisal of evidence for validity, clinical relevance, and applicability, application of results in practice, and evaluation of performance.</p>	<p><b>Relevance:</b></p> <p>Educate providers regarding sources of EBP competency statements: “Competencies in Evidence Based Practice for Health Professionals,” “Center for Evidence Based Medicine Core Competencies,” and “A simple real-world competency framework for general practice.” Introduce the five-step model of EBP to providers.</p>
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## Appendix B

## A Computer Card

Table 2

*A Computer Card*

<b>DSME Referrals</b>	
<input type="checkbox"/>	<b>Patients with Diabetes, knowledge deficit of condition</b>
<input type="checkbox"/>	<b>If yes- refer to DSME Program</b>
<input type="checkbox"/>	<b>Place AMB health coach referral and AMB nutrition referral</b>
<input type="checkbox"/>	<b>Insure that the smartphrase .DSMETEXT is in both orders</b>
<input type="checkbox"/>	<b>Sign orders</b>



## Appendix C

## Diabetes Self-Management Education and Support Algorithm

Table 3

*Diabetes Self-Management Education and Support Algorithm*

Diabetes Self-management Education and Support Algorithm: Action Steps			
Four critical times to assess, provide, and adjust diabetes self-management education and support			
At diagnosis	Annual assessment of education, nutrition, and emotional needs	When new <i>complicating factors</i> influence self-management	When <i>transitions</i> in care occur
<b>Primary care provider/endocrinologist/clinical care team: areas of focus and action steps</b>			
<ul style="list-style-type: none"> <li><input type="checkbox"/> Answer questions and provide emotional support regarding diagnosis</li> <li><input type="checkbox"/> Provide overview of treatment and treatment goals</li> <li><input type="checkbox"/> Teach survival skills to address immediate requirements (safe use of medication, hypoglycemia treatment if needed, introduction of eating guidelines)</li> <li><input type="checkbox"/> Identify and discuss resources for education and ongoing support</li> <li><input type="checkbox"/> Make referral for DSME/S and MNT</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Assess all areas of self-management</li> <li><input type="checkbox"/> Review problem-solving skills</li> <li><input type="checkbox"/> Identify strengths and challenges of living with diabetes</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identify presence of factors that affect diabetes self-management and attain treatment and behavioral goals</li> <li><input type="checkbox"/> Discuss effect of complications and successes with treatment and self-management</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Develop diabetes transition plan</li> <li><input type="checkbox"/> Communicate transition plan to new health care team members</li> <li><input type="checkbox"/> Establish DSME/S regular follow-up care</li> </ul>
<b>Diabetes education: areas of focus and action steps</b>			
<p>Assess cultural influences, health beliefs, current knowledge, physical limitations, family support, financial status, medical history, literacy, numeracy to determine content to provide and how:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Medications—choices, action, titration, side effects</li> <li><input type="checkbox"/> Monitoring blood glucose—when to test, interpreting and using glucose pattern management for feedback</li> <li><input type="checkbox"/> Physical activity—safety, short-term vs. long-term goals/recommendations</li> <li><input type="checkbox"/> Preventing, detecting, and treating acute and chronic complications</li> <li><input type="checkbox"/> Nutrition—food plan, planning meals, purchasing food, preparing meals, portioning food</li> <li><input type="checkbox"/> Risk reduction—smoking cessation, foot care</li> <li><input type="checkbox"/> Developing personal strategies to address psychosocial issues and concerns</li> <li><input type="checkbox"/> Developing personal strategies to promote health and behavior change</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Review and reinforce treatment goals and self-management needs</li> <li><input type="checkbox"/> Emphasize preventing complications and promoting quality of life</li> <li><input type="checkbox"/> Discuss how to adapt diabetes treatment and self-management to new life situations and competing demands</li> <li><input type="checkbox"/> Support efforts to sustain initial behavior changes and cope with the ongoing burden of diabetes</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Provide support for the provision of self-care skills in an effort to delay progression of the disease and prevent new complications</li> <li><input type="checkbox"/> Provide/refer for emotional support for diabetes-related distress and depression</li> <li><input type="checkbox"/> Develop and support personal strategies for behavior change and healthy coping</li> <li><input type="checkbox"/> Develop personal strategies to accommodate sensory or physical limitation(s), adapting to new self-management demands, and promote health and behavior change</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identify needed adaptations in diabetes self-management</li> <li><input type="checkbox"/> Provide support for independent self-management skills and self-efficacy</li> <li><input type="checkbox"/> Identify level of significant other involvement and facilitate education and support</li> <li><input type="checkbox"/> Assist with facing challenges affecting usual level of activity, ability to function, health beliefs, and feelings of well-being</li> <li><input type="checkbox"/> Maximize quality of life and emotional support for the patient (and family members)</li> <li><input type="checkbox"/> Provide education for others now involved in care</li> <li><input type="checkbox"/> Establish communication and follow-up plans with the provider, family, and others</li> </ul>

Mick, G. (2016, November 18). *Referring your patients for diabetes self-management education (DSME) to improve patient outcomes*. ADA Symposium, Carmel, IN, United States. [https://professional.diabetes.org/sites/professional.diabetes.org/files/media/mick\\_2016.pdf](https://professional.diabetes.org/sites/professional.diabetes.org/files/media/mick_2016.pdf)

Appendix D  
Organizational Letter of Support



Date: 10/4/18

To Whom It May Concern,

We at Vidant Medical Group have reviewed Valeriya Ghettes' DNP Project titled "Quality Improvement Initiative to Increase the Number of Referrals to Diabetes Education." Ms. Ghettes has organizational support and approval to conduct her project within our institution (Vidant Family Medicine – Greenville). We understand that for Ms. Ghettes to achieve completion of the DNP program, dissemination of the project will be required by the University which will include a public presentation related to the project and a manuscript submission will be encouraged.

Our organization has deemed this project as a quality improvement initiative and not requiring institutional IRB review.

Thank you.

Heather Deanes, MSN, RN  
Director, Care Management

## Appendix E

## Cost of Materials Needed for the Project

Table 4  
*Cost Analysis of Materials Needed for  
Project*

<b>Expenses</b>	<b>Details</b>	<b>Amount</b>
Printing	Provided by a clinical site	\$0.00
Supplies	List: Pen	\$2.50
	List: Notebook	\$1.00

Appendix F  
Data Collection Tool

Table 5

*Data Collection Tool*

Sequential Number	Patient has diabetes	Referred to DSME class
1		

1 = yes  
0 =  
no

Total with Diabetes            0  
Total Referred to  
DSME class                        0

Appendix G  
Qualtrics Survey



Click "download PDF" to save a copy of this page for your records.  
Note: The IRB Office does not maintain copies of your responses.

Below is a summary of your responses

[Download PDF](#)

### Quality Improvement/Program Evaluation Self-Certification Tool

**Purpose:**

Projects that do not meet the federal definition of human research pursuant to 45 CFR 46 do not require IRB review. This tool was developed to assist in the determination of when a project falls outside of the IRB's purview.

**Instructions:**

Please complete the requested project information, as this document may be used for documentation that IRB review is not required. Select the appropriate answers to each question in the order they appear below. Additional questions may appear based on your answers. If you do not receive a **STOP HERE** message, the form may be printed as certification that the project is "not research", and does not require IRB review. The IRB will not review your responses as part of the self-certification process.

**Name of Project Leader:**

Valeriya Ghetta, DNP student

**Project Title:**

Quality Improvement Initiative to Increase the Number of Referrals to Diabetes Education.

### Brief description of Project/Goals:

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A successful management of diabetes in primary care requires the combination of nutrition counseling, weight loss and maintenance program, smoking cessation education, medical therapy, and behavioral support. Although many studies demonstrated the effectiveness of diabetes education programs for a diabetes management, including an improved adherence to treatment recommendations and healthy lifestyle behaviors, there is an inadequate or even lack of referrals process in primary care. The purpose of this quality improvement project is to implement a referral process by creating a referral form and educating providers on the importance of diabetes education to increase the number of referrals to diabetes classes and individual sessions. The clinical question for this project is "Does the providers' education on the importance and the creation of a referral form will increase the number of patients' referrals to diabetes classes and individual sessions?" A QI project will take place at a primary care clinic in Eastern North Carolina. Four providers of the clinic will be educated on the importance of diabetes education with a goal of the project is to increase the number of patients' referrals to diabetes classes. A PowerPoint presentation will be prepared and a referral form will be created. The data collection will be performed during an implementation phase of the project. The number of patients' referral to diabetes classes and individual sessions will be compared before and after intervention. The Plan-Do-Study-Act (PDSA) cycle - a quality improvement (QI) change model will be utilized in this QI project. A PDSA cycle is used for improvement and testing of change. The "plan" of PDSA cycle will include the collection of baseline data regarding patients' referrals, planning of education session for the providers in primary care settings, and creating a referral form. The "do" will involve providing education session to primary care providers regarding the importance of diabetes education and developing a referral form. The "act" will ensure that improvements are implemented as planned. The "study" conducted to analyze whether the implemented interventions led to increase in patients' referrals. If benchmarks are achieved this cycle can be repeated using the same interventions and if benchmarks are not achieved new strategies can be developed to reach objectives To evaluate if objectives have been met it will be necessary to count the number of referrals after intervention and compare them with the number of referrals prior to intervention. The project's success or failure will be determined based on an improved or not improved referral process.

Will the project involve testing an experimental drug, device (including medical software or assays), or biologic?

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- Yes  
 No

Has the project received funding (e.g. federal, industry) to be conducted as a human subject research study?

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- Yes  
 No

Is this a multi-site project (e.g. there is a coordinating or lead center, more than one site participating, and/or a study-wide protocol)?

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- Yes  
 No

Is this a systematic investigation designed with the intent to contribute to generalizable knowledge (e.g. testing a hypothesis; randomization of subjects; comparison of case vs. control; observational research; comparative effectiveness research; or comparable criteria in alternative research paradigms)?

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- Yes  
 No

Will the results of the project be published, presented or disseminated outside of the institution or program conducting it?

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- Yes  
 No

Would the project occur regardless of whether individuals conducting it may benefit professionally from it?

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- Yes  
 No

Does the project involve "no more than minimal risk" procedures (meaning the probability and magnitude of harm or discomfort anticipated are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests)?

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- Yes  
 No

Is the project intended to improve or evaluate the practice or process within a particular institution or a specific program, and falls under well-accepted care practices/guidelines?

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Yes

No

Based on your responses, the project appears to constitute QI and/or Program Evaluation and IRB review is not required because, in accordance with federal regulations, your project does not constitute research as defined under 45 CFR 46.102(d). If the project results are disseminated, they should be characterized as QI and/or Program Evaluation findings. Finally, if the project changes in any way that might affect the intent or design, please complete this self-certification again to ensure that IRB review is still not required. Click the button below to view a printable version of this form to save with your files, as it serves as documentation that IRB review is not required for this project. 3/24/2019

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## Appendix H

## Referral Rate

Graph 1

*Referral Rate*