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Diabetic Self-Management Education Program Evaluation

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Abstract

Diabetes is a metabolic disease characterized by hyperglycemia, caused by impaired insulin secretions resulting in high hemoglobin A1C levels. Education is beneficial in reducing these as an additive to lifestyle and drug therapy. This student project reflects a program evaluation for a patient diabetes self-management education (DSME) intervention in one small rural outpatient system. DSME classes address the comprehensive blend of clinical, educational, psychosocial, and behavioral aspects of care needed for the daily management of people living with type II diabetes. Three months after completing a DSME the person experiencing type II diabetes has a repeat Hemoglobin A1C level taken for comparison. Hemoglobin A1C results were compared to those who deferred from DSME classes. Of the six referred candidates only three candidates attended a DSME. The results showed that the program had little impact on the patient hemoglobin A1C levels due to low participation (n=2/19). Barriers to attendance were a major issue for participation in this program evaluation and warrant further investigation.

Keywords: DSME, type II diabetes, HBA1c

Introduction

Patients with type II diabetes are at high risk for diabetic-related complications and poor glycemic control if they choose not to attend a diabetic self-management education (DSME) class. Diabetes affects approximately 425 million people globally (Davies et al., 2019). The benefits of attending a DSME program and adapting these practices are that it provides educational support, reduction in hemoglobin A1c (HgbA1C), reduces health care costs, and improves the quality of life. Diabetes is a metabolic disease and a multi-factorial disorder characterized by chronic blood sugars or hyperglycemia, resulting from impaired insulin secretion or actions affecting more than 90% of people affected by type II diabetes (Shabibi et al., 2017). This program evaluation will show a difference in a HgbA1C levels of persons experiencing type II diabetes, which utilize self-management techniques, compared to those that are not utilizing the self-management education?

The purpose of this project is to compare HgbA1C results for person who have completed DSME classes versus these who defer from DSME classes. Stanford University defines diabetic self-management education as helping people with all types of diabetes to help manage this chronic condition over the long term. The educators help develop personalized treatment plans and robust support services that include classes and one-on-one training in nutrition, fitness, and stress management, as well as a monthly support group.

The PICO method has been used for this project. It addresses Patients, population, or process (P), Intervention or process to be assessed (I), comparison group (C), outcome or effect (O). The objective is to see if HgbA1C levels improve for participants. The project will examine patient results with a diagnosis of type II diabetes who attend DSME compared to those who choose not to attend. Comparing the two groups will allow for evaluation of the effectiveness of

DSME on reducing HgbA1C after three months. The goal is evaluating the importance of attending a (DSME) class on reducing HgbA1C levels.

P: Type II diabetics

I: Attending DSME class

C: Type II diabetic who does not attend a DSME

O: Reduction in HgbA1C 3 months after attending a DSME class

Clinical Evaluation

Is there a difference in the HgbA1C level of persons experiencing type II diabetes, which utilize self-management education, compared to those that are not utilize self-management education, with a reduction of HgbA1C, over three months?

Background

Diabetes is a metabolic disease and a multifactorial disorder characterized by chronic blood sugar or hyperglycemia, resulting from impaired insulin secretion or action and affects more than 90% of people with type II diabetes (Shabibi et al., 2017). The World Health Organization (WHO) has estimated that patients with diabetes will increase to 300 million in 2030 (Shabibi et al., 2017). Self-management is learned, based on the ability of individuals to have healthy nutrition, on-time medication use, blood sugar testing, regular exercise, and foot care (Shabibi e al., 2017). Health care providers need to support patients by educating self-care behaviors and referring them to self-management education classes. The importance of self-management education is to improve the outcome and overall health of individuals with type II diabetes and their families. According to reports, less than 50% of diabetic patients in the USA receive diabetes self-management education (DSME; Abazari et al., 2020).

Type II diabetes is a serious, progressive, chronic disease, which leads to poor quality of life and an increased prevalence of costly long-term health complications (David et al., 2019). By referring patients with type II diabetes to a DSME, it promotes a cost-effective strategy for the management of type II diabetes (Abazari et al., 2020). Self-care is learned and is based on the ability of individuals to perform caring practices on their own; it has been defined as a strategy to cope with life affairs that promote health and independence (Shabibi et al., 2017). This project aims to add data to support the beneficial impact of DSME to inform healthcare professionals of the importance of recommending DSME. Healthcare providers may have a lack awareness of DSME services but need to be educated that every type II diabetic that is newly diagnosed is to be referred to a DSME, and type II diabetics should have a refresher course yearly.

Diabetic self-management education is the ongoing process to facilitate the necessary knowledge, skill, and ability to allow for self-care behavior and promotes lifestyle change (Fløde et al., 2017, p. 789). DSME aims to support informed decision-making, self-care behaviors, problem-solving and active collaboration with the healthcare team to improve clinical outcomes, health status, and quality of life (Fløde et al., 2017). Systematic reviews and meta-analyses show that group-based educational research interventions for people with type II diabetes improve knowledge of diabetes in the short and long term and improve diabetes control (Fløde et al., 2017, p 790). An article stated that implemented self-management programs for type II diabetics showed that a substantial proportion of participants with type II diabetes experienced lasting benefits from a DSME program (Fløde et al., 2017, p. 793). The participants of the project showed improvement in their knowledge of diabetes and adaptations to their lifestyle learned from DSME for three months afterward. The project found that diabetics with a HgbA1C of > 7% have the greatest need for lifestyle management and education and these patients benefited

the most from DSME. Adherence to self-care activities improved the quality of life of patients and their families, but also reduced health care costs. The purpose of diabetic education is to allow patients to manage their care and improve patients' quality of life.

To begin the quality improvement project, participants would first be asked to attend a DSME class individually or as a group for a better understanding of type II diabetes, such as educational support, reduction of HgbA1C, reduced health care cost, and improved quality of life. To assess the significant of DSME, HgbA1C will be collected three months after DSME classes to see if there was a reduction from the previous HgbA1C.

A quantitative article reported that persons with diabetes who were referred to clinical consultations but did not attend have worse glycemic control with more diabetes-related complications and a higher number of admission (Schwennesen et al., 2015). Little is known about the reasons for non-attendance among persons with diabetes, but two studies have reported that the lack of information about self-management education, unmet personal preferences, and a patient's relationship with their disease are the main barriers (Schwennesen et al., 2015). Timing and patient readiness to change have been shown to affect self-management education outcomes (Schwennesen et al., 2015).

Diabetic self-management education addresses the comprehensive blend of clinical, educational, psychosocial, and behavioral aspects of care needed for daily management and provides the foundation to help all people with diabetes (Powers et al., 2020, p. 1636). The Consensus Report recommends that DSME has clinical benefits to improve HgbA1C with reductions that are additive to lifestyle and drug therapy (Powers et al., 2020, p. 1636). Recent data showed that DSME average HgbA1C reduction is 0.45-0.57% when compared with usual care for type II diabetic patients. The DSME classes decrease complications and promote

lifestyle behaviors such as healthy eating plans, regular physical activity, and increased healthy coping skills (Powers et al., 2020, p. 1638).

There are a variety of DSME classes to present to patients with diabetes, thus enabling the self-selection of a method that best meets their needs. DSME can be provided through a hospital-based/health care facility location, nontraditional settings such as patient-centered medical homes, community health centers, pharmacies, and home settings. Telehealth and mobile applications have recently been added increasing access to education and support groups. Person-centered approaches are provided to meet individual needs such as various learning preferences, literacy, numeracy, language, culture, physical challenges, scheduling challenges, social determinants of health, and financial challenges (Powers et al., 2020, p.1639). There are four key times to provide and modify DSME: 1) at diagnosis, 2) annually and/or when meeting treatment targets, 3) when complicating factors develop, and 4) when transitions in life and care occur (Powers et al., 2020, p. 1640).

DSME is a service delivered by qualified personnel which include diabetic care and education specialist, registered dietitian nutritionists, nurse educators, and mental health care providers. The best practice methods ha a profound effect on the ability to effectively support patients with diabetes. The goal is to improve clinical care and education services, improve the health of individuals and populations, and reduce diabetes-associated health costs (Powers et al., 2020, p. 1636).

Translation Framework

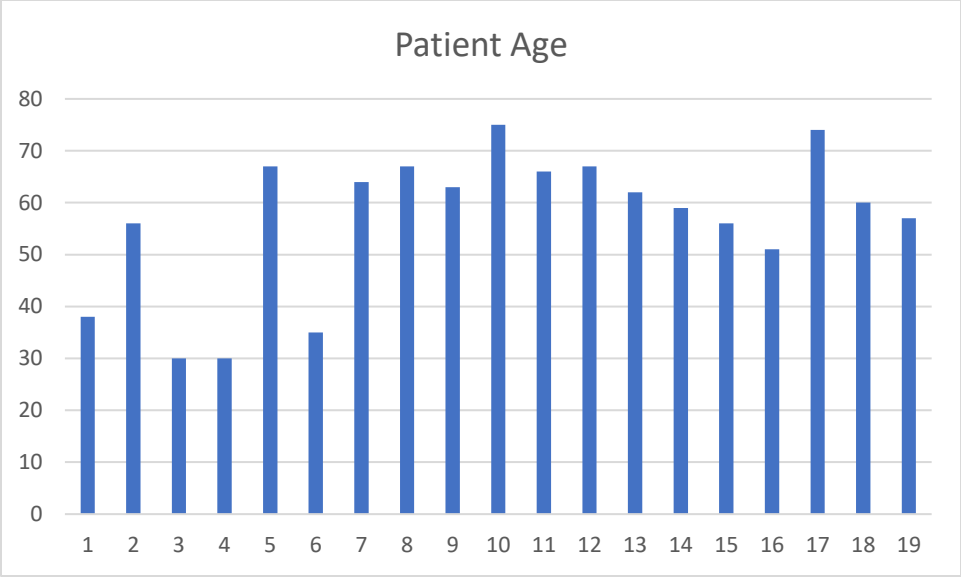
The RE-AIM model was developed as a framework to report research and later organize reviews of the health promotion and disease-management literature (White et al., 2021, p. 50). The goal of the RE-AIM model is to encourage planners and evaluators to pay close attention to

essential program elements, including external validity, to improve the implementation and sustainable adoption of generalized evidence-based interventions (White et al., 2021, p. 50). The five steps in the RE-AIM are as followed:

- Reach: the target population (How do I reach the target population?)
- Effectiveness or efficacy: (How do I know if my intervention is effective?)
- Adoption: by target settings or institutions (How do I develop organizational support to deliver my intervention?)
- Implementation: consistency of the delivery of the intervention (How do I ensure that the intervention is delivered properly?)
- Maintenance: if intervention affects the individuals and setting over time (How do I incorporate the intervention so that it is delivered over the long term?)

Diabetes is projected to increase in the U.S. from 22.3 million in 2014 to 39.7 million in 2030, to 60.6 million in 2060, and 90-95% of those with diabetes have type II (Powers et al., 2020, p. 1636). The first step in the RE-AIM model is to reach the target population. Patients with type II diabetes are the target population and they will be reached in a rural endocrinology clinic. The target population will have a diagnosis of type II diabetes and have never been to a DSME class. The age range will be over 30 years of age and have the desire to increase their knowledge regarding the chronic illness of diabetes by attending a DSME class as a group or one-on-one training. The participants attending any DSME class will attend the outpatient diabetic education center.

Table 1.



The second step is the effectiveness of the DSME class. All participants will have a HgbA1C before DSME classes and follow-up HgbA1C three months after DSME classes are initiated. The group that attended a DSME class will be educated by a certified diabetic educator and will continue to work with that educator after the class. The DSME classes will consist of assessing cultural influences, social determinants of health, health beliefs, current knowledge, physical limitations, family support, financial and work status, medical history, learning preferences, literacy, and numeracy to determine which content to provide and how. DSME training will educate on medication, glucose monitoring, nutrition, and preventing, detecting, and treating acute and chronic complications. The participant's HgbA1C will be compared before and after DSME classes to determine the effectiveness of individuals who attended the DSME class versus individuals who deferred from attending DSME class.

The third step is the adoption step. The rural endocrinology clinic will need to adopt the idea that individual DSME training will need to be conducted at the clinic or by telehealth. The fourth step is implementation. The diabetic center for group DSME is conducted by certified

diabetic educators. Their education comes from the American Diabetes Association. The endocrinology clinic follows the same guidelines for education and training.

The final step is the maintenance sustainability. The participants who attend a DSME need to be monitored and provided with continued education. DSME needs to be initiated at diagnosis and have a series of visits for ongoing education and improved outcomes for patients living with type II diabetes. Participants need to have DSME annually to review new techniques, technology, and updated information. Patients with type II diabetes need DSME when complicating factors develop and when transitions in life and care occur.

Translation Methods

The evaluation aims to improve the knowledge of self-care in patients with type II diabetes, who attend DSME compared to individuals who defer from attending DSME, and to compare the initial and final HgbA1C, conducted three months apart after the DSME was implemented. The translation method is a clinical pathway. Clinical pathways are defined as ‘structured, multidisciplinary care plans used by health services to detail essential steps in the care of patients with a specific clinical problem (White et al., 2021, p.178). Clinical pathways aim to link evidence to practice and optimize clinical outcomes, by doing so, the clinical population is type II diabetics that lack knowledge about type II diabetes. The pathway will be seen in the endocrinology clinic and refer patients to a DSME program at the diabetic education center. The participants will have an initial HgbA1C check before the DSME. The participants will have ongoing clinical education on type II diabetes and the benefits and value of initial and ongoing DSME. The individuals who attend the DSME will be educated on a medical nutritional therapy plan with the overall management strategy, including the DSME plan, medications, and physical activity.

The research anticipated 20 individuals; however, only three individuals attended the DSME class and then were used to compare the effectiveness of treatment after three months by checking a HgbA1C. The projected outcomes were to educate about type II diabetes and a reduction in HgbA1C after three months of the program. It is expected that participants will improve blood glucose levels. The participants will be educated on complications related to diabetes and how to prevent those complications for quality care. The participants will decrease costs by reducing hospitalization from uncontrolled diabetes.

The project aims to see if patients with type II diabetes benefit from DSME classes by measuring a HgbA1C before DSME and three months after the DSME. The plan is to measure quality improvement and apply strong evidence to improve patients' knowledge about type II diabetes, education on the impact of diet and exercise, and glucose monitoring.

The DSME training is currently offered at the outpatient diabetic center, but individual training will be established through this research and the priorities to improve the knowledge and The quality goal improve HgbA1C, by implement a healthy lifestyle such as diet and exercise, prevent complications associated with diabetes, and reduce the cost of medical expenses. Some failures regarding the outpatient DSME are that some individuals require transportation, lack of income for diet and supplies, language, and literacy level which prohibits them from attending. The desired outcome is to improve care to patients with type II diabetes who participate in a DSME by reducing HgbA1C to see which treatment is preeminent.

Literature Methods

Databases that were searched to find scholarly articles were PubMed, Google Scholar, MEDLINE, the Cochrane Library, OvidSP, Nursing & Allied Health Database, Nursing

Reference Center Plus, Up To Date, and CINAHL for the evaluation of benefits that diabetic self-management education has on patients with type II diabetes and their compliance, from the beginning of 2017 to 2021. Limits include the English language. Search words used were type II diabetes, lifestyle changes, self-educational classes, and improving quality of life. Nine articles were selected and applied to the literature review.

Review of Literature

Educational Support

Diabetes is a complex and challenging disease that requires daily self-management decisions made by the person with diabetes (Powers et al., 2020). Diabetic self-management education gives patients with type II diabetes educational support to improve their knowledge of the disease and decrease complications. DSME is a cost-effective strategy for the management of type II diabetes and it promotes and maintains the necessary behaviors and facilitates the learning of knowledge, skills, and abilities necessary for self-management (Abazari et al., 2020). Registered Nurses or Certified Diabetic Educators support relatedness in health care for people with type II diabetes and may foster optimal motivation for self-management behaviors (Lie et al., 2018).

Articles support the benefits of patient seeking relationships with nurses which involves understanding, trust, autonomy, caring, and professional expertise (Lie et al., 2018). Patients who completed DSME develop lifestyle intervention, specifically intensive diet and physical activity, and medical nutritional therapy to improve compliance and knowledge awareness of type II diabetes (Sun et al., 2017). Educational support can help patients to control type II diabetes in a way that influences nutritional patterns and type of physical activity and their daily life, so undoubtedly training is a fundamental part of controlling the disease (Maheri et al., 2017). The

effectiveness of the educational intervention and patient support has improved patients' education on healthy eating habits, increased awareness, changed attitudes, and removed social, economic, environmental, and cultural barriers that hinder a healthy lifestyle.

Projects have shown poor self-management status among patients with type II diabetes due to many different factors such as their limited knowledge about diabetes, their poor adherence to treatments and dietary regimens, and their ineffective management of diabetes complications (Abazari et al., 2021). Ineffective management of diabetes results in chronic complications such as cardiovascular disease, cerebrovascular accidents, retinopathy, nephropathy, neuropathy, and many other costly problems (Abazari et al., 2021).

Reduction in A1c

Diabetic self-management education can lead to a reduction in HgbA1C after three months of classes. The reduction of HgbA1C is additive to lifestyle and drug therapy (Powers et al., 2020). HgbA1C quantifies the amount of glycated hemoglobin in the blood and the measurement of long-term glycemic exposure (Shapiro et al., 2019). HgbA1C levels that are high, are directly related to the risk of developing a microvascular disease such as diabetic retinopathy (Shapiro et al., 2019). Evidence showed that patients with type II diabetes who attend a DSME class and then make lifestyle changes will have an average HgbA1C reduction of 0.45 – 0.75% when compared with usual care for people with type II diabetes (Powers et al., 2020). Articles states that patients with type II diabetes who completed more than one hour of DSME over the course of 3 months and those who participated on an ongoing basis were found to have significant reductions in mortality and HgbA1C (an average absolute reduction of by HgbA1C 0.57%) compared with those who spend less time with diabetic educator care and education specialist (Powers et al., 2020).

DSME classes through telehealth have been known to reduce HgbA1C (Rasoul et al., 2019). DSME has proved to reduce HgbA1C in patients with type II diabetes to prevent chronic complications and costly medical treatment. Evidence reports that three months after DSME there were significant reductions in HgbA1C in participants, thus providing evidence for the effectiveness of nutrition and physical activity interventions with proper control of blood sugars at preventing many dangerous complications of diabetes (Maheri et al., 2017). It was estimated that every 1% reduction in HgbA1C reduces 37% of the microvascular complications and 21% of macrovascular complications of diabetes (Maheri et al., 2017).

Reduction of Cost

According to the statistics provided by the International Diabetes Federation, the number of adult people with diabetes will increase from 463 million in 2019 to 700 million by 2045 (Abazari et al., 2021). Diabetes imposes a heavy cost on healthcare systems, the annual mean cost of Diabetes for each afflicted person is estimated to be around 1000 dollars (Abazari et al., 2021). Type II diabetes is a challenging public health problem, with serious consequences on health and health care costs (Sun et al., 2017). Patients with type II diabetes that have not received a DSME may greatly reduce their life expectancy and lack of training could lead to numerous medical complications, such as renal disease, diabetic neuropathy, and macrovascular disease (Sun et al., 2017). These complications can increase economic costs in the US from $174 billion in 2007 to $275 billion in 2012 and current data shows no signs of this diabetic crisis slowing down (Sun et al., 2017). The cost of diabetes in the U.S. in 2017 was $327 billion including direct medical costs ($176 billion) (Powers et al., 2020).

Evidence shows that those who participate in DMSE use best practices and have lower health care costs, even though outpatient and pharmacy costs are higher for those who use

diabetes education, these costs are offset by lower acute care costs (Powers et al., 2020). DSME is cost-effective by reducing emergency department visits, hospital admissions, and hospital readmissions.

Improves Quality of Life

The goal of a DSME class is to control blood sugar, prevent acute side effects, and increase the quality of life of a diabetic patient (Rasoul et al., 2019). Quality of life is considered an important outcome of health and is of interest as a major issue in taking care of type II diabetes (Rasoul et al., 2019). DSME improved the quality of life and health outcomes and is cost-effective (Powers et al., 2020). All members of the healthcare team and health care systems should promote the benefits, emphasize the value, and support participation in initial and ongoing DMSE for all people with diabetes (Powers et al., 2020). DSME has positive effects on different interventions in controlling diabetes, which include lifestyle modifications, such as improving the nutritional status, increasing physical activity, smoking cessation, controlling, and following up with patients (Rasoul et al., 2019). Patients with type II diabetes who adopt lifestyle changes can reduce their risk of cardiovascular disease, cerebral accidents, and renal failure.

Purpose of Project

The sampling frame would consist of any person that has the diagnosis of type II diabetes. To begin the project, participants would first be asked to attend a DSME class to provide educational support, reduction of HgbA1C, reduced health care cost, and improved quality of life. To assess the importance of DSME, HgbA1C was collected at the start and three months after educational classes to see if there was a reduction from the previous HgbA1C.

Significance

The project compares patients HgbA1C for those who have completed diabetic educational classes versus HgbA1C, who defer from DSME class. Comparing the two groups showed that the effectiveness of attending DSME did not reduction HgbA1C after three months. The project had limited sample size who attend a DSME.

Stakeholders

The Doctoral Nurse Practitioner (DNP) capstone project will have a direct impact on healthcare. Stakeholders are defined as "individuals or groups who touch the project in some way or have an interest in the project outcome" (Moran et al., 2017). Two groups would involve direct stakeholders. One direct stakeholder involved would be the healthcare providers. Healthcare providers are directly impacted by educating patients with type II diabetes. The purpose of attending a DMSE program is to improve the knowledge of the disease process, prevent complications, and reduce hemoglobin A1c. The healthcare providers are the key stakeholders and can use the American Diabetes Association (ADA) to develop action plans for increased referral to and utilization of DSME (Powers et al., 2020). The goal is to increase the focus on achieving treatment targets early and maintaining them throughout a person's lifetime.

The first group that directly impacts healthcare would be patients with type II diabetes. The purpose of DSME is to give patients with type II diabetes the knowledge, skills, and confidence to accept responsibility for their self-management (Powers et al., 2020). The project aims to support informed decision-making, self-care behaviors, problem-solving and active collaboration with the healthcare team to improve clinical outcomes, health status, and quality of life (Fløde et al., 2017). Patients with type II diabetes can have serious consequences on health and health care costs (Sun et al., 2017).

Patients with type II diabetes would benefit the most by attending a DSME. They would increase their knowledge, skills, attitudes, and self-efficacy, and reduce HgbA1C (Maheri et al., 2017). Health education and training programs play an important role to help diabetics follow self-care programs and a healthy lifestyle (Maheri et al., 2017). The purpose of DSME is to educate patients to control type II diabetes in a way that influences nutritional patterns and physical activity and their daily life. Patients who attend a DSME would reduce their costs in healthcare expenses.

Analysis

A health care clinical microsystem is a "small group of people including health professionals and patients and their families who work together in a defined setting regularly to create care for a discrete subpopulation of patients (Joanne V. Hickey & Christine A. Brosnan, 2016). The healthcare providers need to have protocols set in place that every type II diabetic is to be referred to a DSME program. The healthcare providers need to assess the barriers a type II diabetic may have regarding diet, exercise, and lifestyle modifications. Patients with type II diabetes have HgbA1C drawn every 3 months and a reminder is placed in the electronic medical record (EMR) under reminders. A yearly reminder of when a patient needs to be referred to a DSME program can be placed in the EMR. The micro-level context of the Process-Person-Context-Model (PPCT) includes abdominal obesity, family history of type II diabetes, time since diagnosis, diabetic complications, and gender (Kanan et al., 2019). Social networks include aspects of support from family members, partners, and friends sharing emotional closeness and are in the micro-level which contributes to diabetes self-management (Kanan et al., 2019).

A mesosystem is a larger unit in which providers are responsible for large clinic programs, clinical support services, and administrative services (Joanne V. Hickey & Christine

A. Brosnan, 2016). Patients with type II diabetes will be referred to the diabetic education center. The diabetic education center needs to have reminders for patients' follow-ups as well to improve outcomes. A diabetic education center is vital to improving patients' behavior, attitudes, diet, and reducing HgbA1C. The diabetic education center needs to be a support system for patients with diabetes. Applications of web-based self-care interventions are promising since they provide easy access for patients with computer literacy and can be accomplished by spending minimum costs (Rasoul et al., 2019). In the form of telehealth and web programs, media has improved patient knowledge, changed behaviors, and improved clinical outcomes by allowing easier access to DSME which has contributed to lowering HgbA1C.

The macrosystem refers to a broader, overarching sector such as large corporations, state, or national organizations or systems (Joanne V. Hickey & Christine A. Brosnan, 2016). Hospital organizations can offer DSME programs to the public through health fairs. The hospital organization will see a decrease in admissions and healthcare costs if more patients with type II diabetes are being educated on the specifics such as how to eat healthier, exercise, and monitor blood glucose levels regularly.

Patients would benefit from the outcomes of all three systems. Patients' HgbA1C would be reduced to under 7.0%, a decrease in renal disease, neuropathy, and retinopathy would be seen and organizations and patients would save on healthcare costs. The State Health Departments are increasing the number of DSME programs in communities and securing Medicaid reimbursement in the states with no DSME coverage (Morgan et al., 2018).

Impact on Population

Patients with type II diabetes will be most affected by attending a DSME program. Education is considered a key priority in the management of type II diabetes. Patients with type II diabetes who attend a DSME will have a better understanding of the disease process. The American Diabetic Association recommends that DSME provide information, skills, and competencies for diabetes self-care (Surucu et al., 2017). Studies have shown that patients with type II diabetes who participate in a DSME program have reduced HgbA1C levels, have fewer emergency department visits, and lower in-patient costs (Morgan et al., 2018). Patients who attend a DSME program have reductions in drug therapy, reductions in all-cause mortality, and decreases diabetes-related stress (Powers et al., 2020).

Evidence has shown that DSME is cost-effective by reducing emergency department visits, hospital admissions, and hospital readmissions (Powers et al., 2020). The U.S healthcare system cannot sustain the cost of care associated with the increasing incidence of diabetes and diabetes-related complications, so all the healthcare teams and healthcare systems should promote the benefits, emphasize the value, and support participation in DSME programs (Powers et al., 2020).

Sustainability

Patients being diagnosed with diabetes in the U.S is projected to increase to 39.7 million by the year 2030 (Powers et al., 2020). The plan is to continue to educate and refer patients with type II diabetes to a DSME program. The plan is to have certified diabetic educators in the clinic to start the education process. The certified diabetic educator can spend more time educating patients about the disease process, adopting a healthy diet, physical activity, and how to take their medications. The health care system needs to have scheduled outpatient support group at

least one night a month, so individuals who work have a chance to attend. There needs to be a support group on social media. Non-profit organizations, such as hospitals, can help provide educational programs and health fairs for type II diabetes.

Policies/Practices

Patients with type II diabetes who attend a DSME program and reduce, HgbA1C prevent microvascular complications, and macrovascular complications, and improve their quality of life will reduce insurance costs. A policy is not in place currently, but there is overwhelming evidence that attending a DSME program improves overall health. Literature that shows DSME improves health in type II diabetes and changes the way providers practice by referring more patients to the program. Clinics can have diabetic educators on staff to promote education at an earlier onset. Patients who are involved in education at the clinic through social media, web classes, or zoom will attend a DSME program and share with family and friends who are diabetic. The positive outcomes to improve healthy lifestyles and reduce complications associated with type II diabetes will have a greater impact on patients and the community. The clinics can have booths set up at the hospital health fairs to promote DSME programs.

Scholarship is defined as the discovery, integration, application, and teaching of knowledge (Cheryl Holly, 2019). A mission statement will define the purpose of the clinic and assist in developing professional practices and services. Stakeholders can help develop, utilize, monitor, and evaluate to help with a strategy to improve referrals.

Post-graduation, the plan is to reach out to the Centers for Medicare and Medicaid Innovation (CMMI) to support the research and how DSME programs improve the quality of life in type II diabetics. The evidence from the research will help close the gap with administrators, providers, and quality improvement to work together to develop innovative approaches to health

care that would improve the referral of patients attending a DSME and lower the overall cost (Joan R. Bloch et al., 2016). The Agency for Healthcare Research and Quality (AHRQ) helps with funding for the development of quality improvement processes and outcomes measured, and tools (Joan R. Bloch et al., 2016). A non-profit organization can help with the need by collaborating with the Diabetic education center to improve patient care.

Financial Feasibility

The project will be conducted at a local endocrinology clinic over eight months. The results will be compared to the HgbA1C test of individuals who attended versus those who deferred from attending a DSME class in which costs are calculated in dollars and outcomes are calculated in health-related units (Joanne V. Hickey & Christine A. Brosnan, 2016). The participants will be reviewed by convenient sampling and accessibility will be adequate. The lead person is an advanced nurse practitioner who works at the endocrinology clinic. There are no major ethical or other constraints for this study.

The health-related units may focus on the outcomes such as lives saved or years of living saved, or they may focus on clinical indicators achieved, such as a decrease in in which costs are calculated in dollars and outcomes are calculated in health-related units (Joanne V. Hickey & Christine A. Brosnan, 2016). for type II diabetes (Joanne V. Hickey & Christine A. Brosnan, 2016). The endocrinology clinic can establish a program to improve the health status of patients with type II diabetes, by promoting the need for DSME classes. The reasoning for attending DSME classes is to decrease HgbA1C, decrease hospital admissions, and have reductions in long-term complications. The interventions of attending a DSME class are to improve cost-effectiveness and reduce health care costs.

An article on the cost-effectiveness of a community-based diabetes prevention program stated that in 2012, 22.3 million U.S. residents with diabetes incurred an economic burden of $176 billion over direct medical costs and $69 billion in productivity. (Gilmer et al., 2018). Diabetes continues to be the leading cause of heart attack, stroke, heart failure, eye disease, lower-extremity amputations, and renal failure in the U.S. (Gilmer et al., 2018). The diabetes prevention program demonstrates that in less than three years, an intensive lifestyle intervention or pharmacotherapy with metformin delays or prevents the onset of type 2 diabetes. The article examines the cost-effectiveness of We Can Prevent Diabetes (WCPD) from the perspective of the health care sector.

A second article studied the cost-effectiveness of facilitating access to a self-management website. The article states that 422 million people are affected with type II diabetes. The personal health care cost of type II diabetes is estimated at 11% of total global health expenditure (Li et al., 2017). Most of the costs are due to preventable complications. Patient education and self-management support have been identified as a priority for global health and have the potential to improve outcomes and reduce costs (Li et al., 2017).

A cost-effectiveness analysis was conducted on individualized glycemic control for U.S. Adults with type 2 diabetes. The article showed that 9% of the United States population are people who have type II diabetes which cost the United States an estimated $245 billion annually (Laiteerapong et al., 2017). Ten years ago, a cost-effectiveness analysis reported that intensive glycemic control with glucose-lowering medications was cost-effective, with an incremental cost-effectiveness ratio of $41,384 per quality-adjusted life-year compared with conventional control (Laiteerapong et al., 2017).

Economic Impact

According to the statistics provided by the International Diabetes Federation, the number of adult people with diabetes will increase from 463 million in 2019 to 700 million by 2045 (Abazari et al., 2021). Diabetes imposes a heavy cost on healthcare systems so the annual mean cost of Diabetes for each afflicted person is estimated to be around 1000 dollars (Abazari et al., 2021). Type II diabetes is a challenging public health problem, with serious consequences on health and health care costs (Sun et al., 2017). Patients with type II diabetes that have not received a DSME may have greatly reduced life expectancies and it can lead to numerous medical complications, such as renal disease, diabetic neuropathy, and macrovascular disease (Sun et al., 2017). These complications can increase economic costs in the US from $174 billion in 2007 to $275 billion in 2012 (Sun et al., 2017). The cost of diabetes in the U.S. in 2017 was $327 billion including direct medical costs ($176 billion) and lost productivity ($69 billion) (Powers et al., 2020).

Literature shows that those who participate in DMSE use best practices and have lower health care costs, even though outpatient and pharmacy costs are higher for those who use diabetes education, these costs are offset by lower acute care costs (Powers et al., 2020). DSME is cost-effective by reducing emergency department visits, hospital admissions, and hospital readmissions.

Economic Gains

Economic strain in type II diabetes is growing in our country and is costing health care billions of dollars. Patients need to be educated on the importance of participating in a DSME to promote educational support, reduction in HgbA1C, reduce health care costs, and improve quality of life. Patients with type II diabetes can experience chronic complications if not well

controlled. A patient who attends DSME will benefit from support groups and professional educators that will help them adopt a healthy lifestyle through diet, exercise, and increase knowledge of the disease. DSME is an important program that is offered to all diabetics and it is the health providers' job to educate and provide these services to their patients.

Method

A convenience sample of pre and post intervention design of 20 subjects were selected from the local endocrinology clinic, with three subjects who attend a DSME program and seventeen subjects who chose not to attend a DSME program and HgbA1C will be compared between the two. This quality improvement project aims to increase the importance of attending a (DSME) class to reduce HgbA1C, reduce mortality, and improve quality of life. The inclusion criteria for the subject population are that all subjects must be 18 years and older with a diagnosis of type II diabetes. Exclusion criteria are anyone who is under 18 years of age with no diagnosis of type II diabetes and pregnancy. The inclusion and exclusion criteria were designated and assessed by this provider. There will be no subject recruitment advertising, names, or any demographics connected with the subjects. The subjects will not be paid or compensated for their participation.

Data Collection

A convenience sample of 20 subjects with type II diabetes from an endocrinology clinic were divided into two groups. One group of convenience samples consisted of three subjects with type II diabetes that chose to participate in a DSME program and the second group is seventeen subjects with type II diabetes who chose not to participate in a DSME program. Both groups' HgbA1C were collected and then again three months after group one completes a DSME program and compares the results. An experimental project design is for testing the cause-and-

effect relationships and provides strong evidence on which to change and improve clinical practice (Melnyk & Fineout Overholt, 2019).

The demographic data will be patients who are 18 years and older with a diagnosis of type II diabetes. The participants will be from the local endocrinology clinic. The participants who attend a DSME program will attend Diabetic Education Centers. The data collected for all 20 participants included an initial HgbA1C and repeated three months later. The two groups' HgbA1C will be compared to see if group one who attends a DSME versus group two, who chooses not to attend a DSME has a reduction in HgbA1C.

Data Management

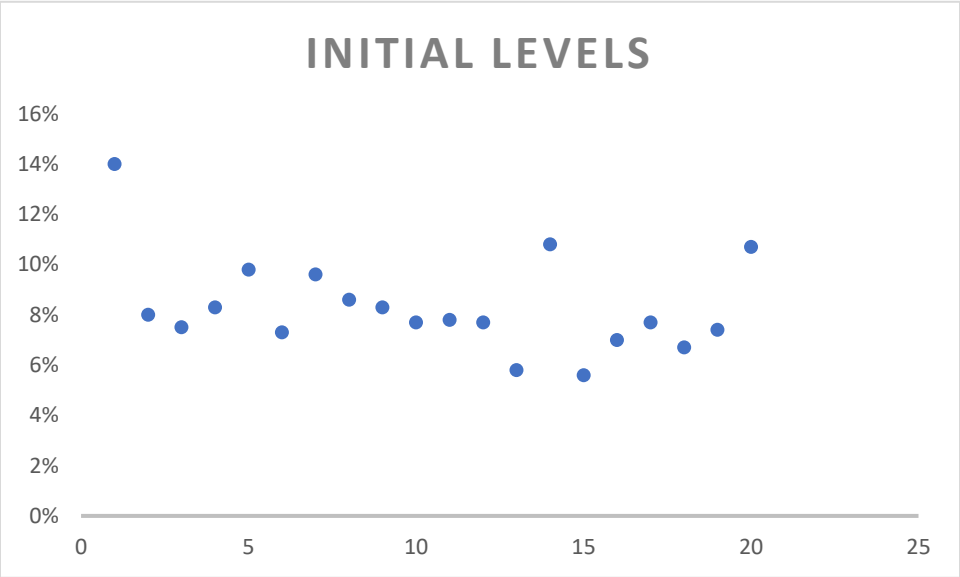
Data will be collected from an electronic health record on a password-protected computer at an endocrinology clinic. The primary investigator will obtain the data with no identifiable patient information. The initial hemoglobin A1c of everyone will be submitted in the appropriate file and repeated in three months. Records of patients have been in a locked cabinet accessible only to the author during the process and will be shredded at the end of the three-year data maintenance period. The data is valid, due to the HgbA1C being collected at the local endocrinology office. Group one who attends the Diabetic Education Center will be referred from the clinic. The data records will be kept in a locked secure computer with a password and the data will be deleted in the trash file, then the trash file emptied upon completion of the project.

Data Process

The sample size is 20 persons diagnosed with type II diabetes. The investigator will have to review 40 charts and HgbA1C for each chart. The data from each chart will be an initial HgbA1C and a repeat HgbA1C in three months. Three participants out of the total 20

participants attended a DSME class. The certified diabetic educators kept a list of patients from our clinic that attended a DSME class. The data collection took eight months to complete.

Table 2. Initial HgbA1c Levels

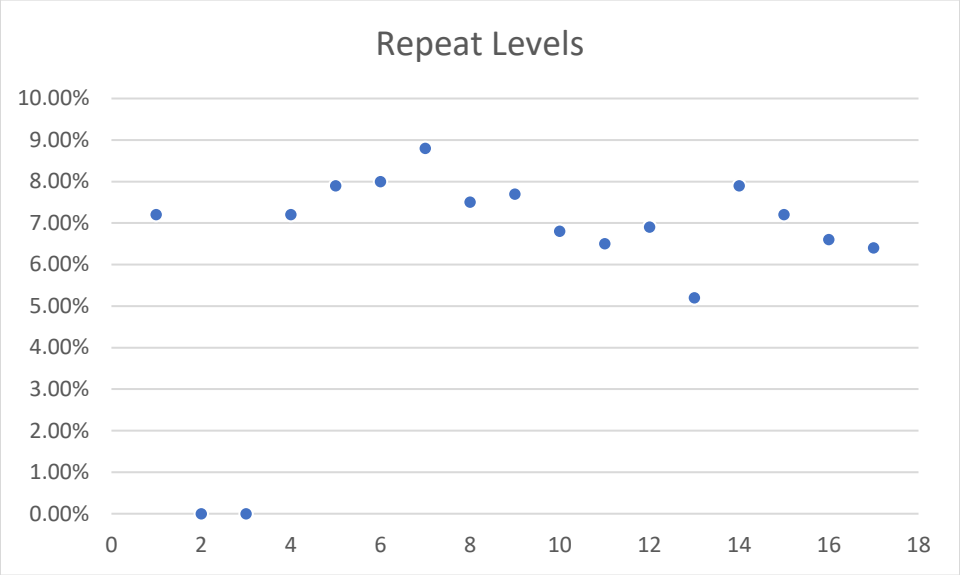


Instruments

The instruments used to collect data were placed on a spreadsheet. The first group of participants that attended a DSME class. A column of participant's initial HgbA1C was recorded and additionally a HgbA1C was repeated 3 months after attending a DSME class. The last column had type II diabetics hemoglobin A1c three months after no DSME intervention. There is no formal permission needed for this project.

The project does not need informed consent because there were no active subjects participating. The data is considered protected health information because chart numbers will be used to assess initial HgbA1C and a repeat HgbA1C in three months.

Table 3. Repeat HgbA1c



Analysis

A descriptive analysis will be used for each variable. Descriptive analysis is the most straightforward form of modeling and provides the investigator with a snapshot of the data (Joan R. Bloch et al., 2016). Descriptive analytics are counts, percentages, averages, and sums, all of which can help convert massive data into understandable chunks of information (Joan R. Bloch et al., 2016). The project collected HgbA1C on all type II diabetes and compared the results to participants who attended a DSME or did not. The averages will be calculated to see if hemoglobin A1c was significantly improved if attending a DSME versus a patient who deferred from attending a DSME. Spreadsheet software was used for the data analysis.

The average results of the initial HgbA1C collected before any diabetic self-management education for all the participants with type II diabetes was 7.78%. The average results for the three patients with type II diabetes who attend a diabetic self-management education was 8.05% HgbA1C. The average results of patients with type II diabetes who deferred from attending a DMSE three months after the initial HgbA1C was collected were 7.1%. Two patients out of the

three came back to the clinic for the three months follow-up to have a second HgbA1C drawn. One patient went to the DSME class but never came back to the clinic for their three-month follow-up. There is no significant improvement in the HgbA1C from the patients with type II diabetes who attend the DSME versus patients who deferred from attending a DSME.

Limitations

This program evaluation project was interesting in that most patients with type II diabetes reported that they would attend a DSME, but the majority never attended. The Data showed a limitation of sampling size that attended a DSME. Only three participants went to a DSME class, but out of the three that attended, only two returned for their follow-up visit at the clinic. Another limitation was the time frame of the project. The project data was collected over eight months but needed to be an ongoing quality improvement project. The sample size of twenty participants was a barrier to conducting much evaluation, especially since only 2 participants followed through on the program with repeat lab levels.

One barrier is that fifteen out of the twenty participants deferred from attending a DSME. These participants lived more than an hour away from any DSME class, and they had trouble finding a means of transportation. Several patients must rely on family members to bring them to their appointments, and that means taking off work to do so. Patients stated it is too expensive to travel back and forth to Jonesboro for a DSME class when they have so many doctors' appointments they have to keep. This is a huge barrier that requires further investigation before concluding the effectiveness of the local DSME program in lowering hemoglobin A1clevels.

This author suspects another barrier to participation in the cost of the DSME class. Patients may not want to pay a deductible every time they attend a DSME class. Several patients cannot afford the extra money that has to be spent on attending a DSME class when the class is

offered up as being “free”. Additionally, some patients may not be able to afford the types of food a DSME class suggests that they prepare at home. Patients may also have a barrier regarding the extra gas money cost they need to attend a DSMS class. Some patients may still be working and would not be able to take off work to attend a DSME class during the day when they are offered. Several barriers may hinder patients with type II diabetes from attending a DSME class that this author is not aware of as well.

Conclusion

Type II diabetes is growing in our country and is costing health care billions of dollars. Patients need to be educated on the importance of participating in a DSME to promote educational support, reduction in HgbA1C, reduce health care costs, and improve quality of life. Patients with type II diabetes can experience chronic complications if not well controlled. Patients who attend DSME typically benefit from support and professional educator interactions that will help them adopt a healthy lifestyle through diet, exercise, and increase knowledge of the disease. DSME will reduce long-term complications and reduce HgbA1C. Patients that take DSME will reduce health care costs, by adopting a healthy lifestyle, and decreasing hospitalizations and medication costs. Unfortunately, despite literature to the contrary, this program evaluation did not find that many patients were able to participate in the activity. 78.94% deferred from the program. Given the low participation rate, it would be unfair to evaluate the program solely on the metrics of the two participants.

Implications

Patients with type II diabetes that attended the DSME did verbalize an improved quality of life. In hindsight, it would be pertinent to include additional measures such as this when evaluating self-management programs. Patients need to have more information provided to them

at a low to no cost, so they know it is necessary to improve their health. The quality improvement project shows that there is a breakdown in the system. Patients are not making it to the DSME classes and therefore never receive the information about how to improve their health and manage their diabetes themselves from this free local source. Patients living with type II diabetes need more reliable resources like the DSME concept that are affordable and that have the potential to improve their health. Healthcare providers can make the information available, but they cannot make the patients receive the information.

Further Research

Future investigation should include identifying patient barriers to attending the DSME courses. It would be pertinent to see if the courses should be offered in a different venue such as virtually. It would be wise to obtain the information directly from the patients through qualitative methods. Barriers need to be identified and addressed when affecting participants who need DSME, such as participant-related barriers and environmental-related barriers. Participant-related barriers include cost, timing, transportation, and medical status. Environmental-related barriers include transportation services, cultural, language, and ethnic needs of the population. These participants may benefit from telehealth and more one-on-one training to improve their knowledge of diabetes and education on self-management to improve HgbA1C and quality of life.

Trio of Roles

The role of the APRN is to refer the patients to this program. While that process is effective in making the patient aware of the activity, it alone is not sufficient in getting the patient to the events where they have the opportunity to participate in learning about self-management of their diabetes. The APRN role in the future would be to consider evaluating the

patient barriers to getting to the classes. As a change agent and a leader, the APRN with knowledge of the reasons that patients do not participate is better prepared to take action to address the barriers and to lead through the needed changes.

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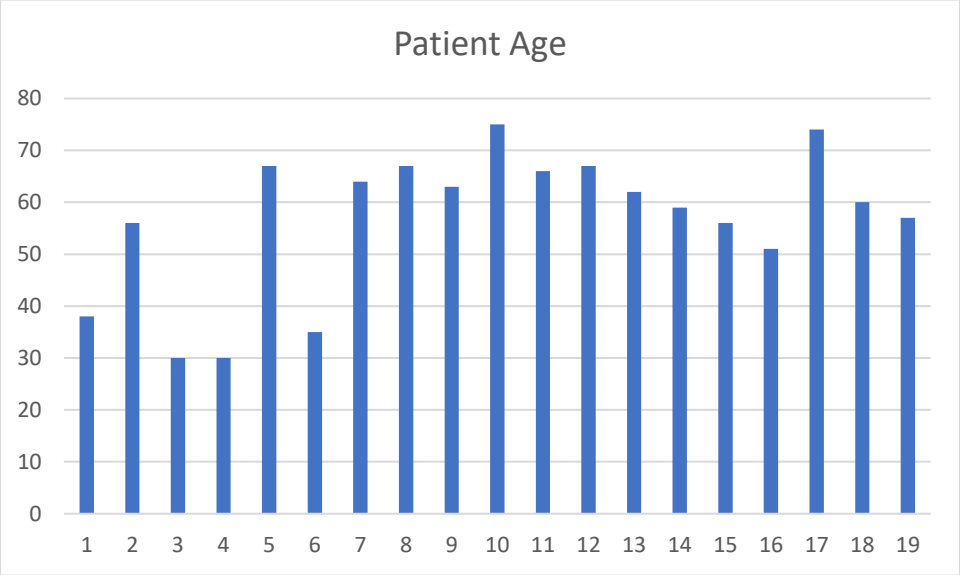
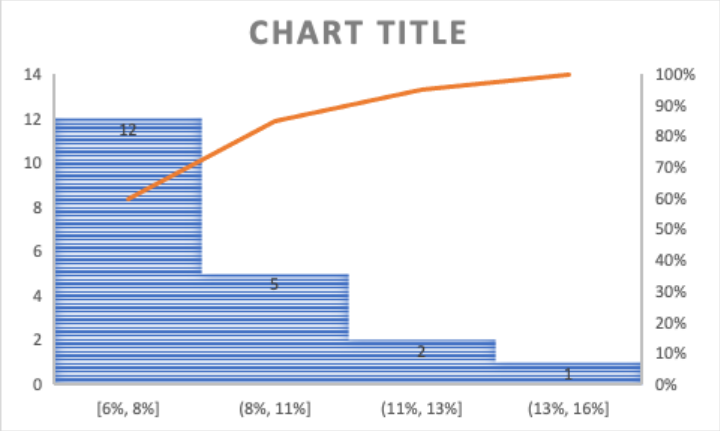
Table 1. Age of Patients in the Local Population



Number of Participants	Patient with type 2 diabetes
1	38
2	56
3	30
4	30
5	67
6	35
7	64
8	67
9	63
10	75

11	66
12	67
13	62
14	59
15	56
16	51
17	74
18	60
19	57

Table 2. Initial HgbA1c Levels



Number of Participant	Initial HbA1c
1	>14
2	8.00%
3	7.50%
4	8.30%
5	9.80%
6	7.30%
7	9.60%
8	8.60%
9	8.30%

10	7.70%
11	7.80%
12	7.70%
13	5.80%
14	10.80%
15	5.60%
16	7.00%
17	7.70%
18	6.70%
19	7.40%

Table 3

Number of Participants	**HbA1c 3 months after attending a DSME program**
1	NA
2	8.50%
3	NA
4	7.60%

5	NA

Figure 1. The Re-AIM Model