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Diabetes Management Protocol in the Rehabilitation Setting

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Walden University

College of Health Sciences

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Hannah Mottel

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Walden University

2017

Abstract

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by

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MS, Walden University, 2015

Project Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

Walden University

February 2018

Abstract

Diabetes mellitus is a growing healthcare problem in the United States. Diabetes affects 1.4 million Americans yearly, impacting the lives of individuals of all ages. One of the most challenging aspects about diabetes is that many individuals are not aware of the impact of the disease on multiple organs until the progression of the disease has reached latter stages. Prevention and early detection of diabetes is a key component of lifesaving interventions including proper nutrition counseling, exercise regimens, management, and patient compliance with a treatment plan. The purpose of this doctoral project was to create a standardized diabetes management protocol for patients in an inpatient rehabilitation facility. Sources of evidence were obtained from the most current literature, including that published by the American Diabetes Association (ADA). Evidence shows that an interdisciplinary teams approach to diabetes management in the rehabilitation facility contributes to successful patient outcomes. The logic model served as a framework for program design and was used as a visual representation for all aspects of the program. The quality improvement process was implemented using an interdisciplinary team approach, with each member of the rehabilitation team playing a special part in meeting the educational needs of the diabetic patient and family. Every diabetic patient requires individualized and specific instruction; therefore, staff members must work together in order to evaluate program effectiveness. This project will effect social change by establishing a protocol that equips patients with the knowledge and tools necessary to manage their diabetes when discharged into the community.

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Section 1: Overview of the Evidence-Based Project

Introduction

The rehabilitation setting is an environment for patients of all ages. Facility placement may depend on the patient's need for restorative care. Patients may enter the inpatient rehabilitation facility for numerous reasons, including restorative care after a stroke, cardiac events, motor vehicle or other traumatic accident or injury, or surgery. Patients enter the facility simply for medical management. Regardless of the patient's primary reason for entering the facility, the rehabilitation team takes on the task of treating the patient holistically. The rehabilitation team focuses on various therapies to include physical therapy, occupational therapy, and speech therapy. Other team members or counseling services may be consulted if necessary. The team sets goals for the patient when arriving to the facility, while collaborating to help the patient to meet those goals before discharge. The essence of rehabilitation is goal-setting (Siegert, 2010). If rehabilitation is to progress, agreed goals and outcomes are essential (Siegert, 2010). The patient is an active member in setting the goals while the family plays a vital part in motivating the patient to help in obtaining their goals and serve as support members.

One of the most significant goals for the rehabilitation facility is for patients to discharge to the home setting and return to their daily functions of life and activity. Rehabilitation is focused on helping patients regain their strength and independence. A vital component in patients returning home safely without readmissions to the acute care facility is proper understanding and control of their medical diagnosis (Siegert, 2010).

Rehabilitation goals are often solely focused on physical mobility and independence, but they should also be geared towards proper disease management (Siegert, 2010). Diabetes management can be a task that is not only complicated for the patient, but also the provider. One goal of Healthy People 2020 is to “reduce the disease burden of diabetes mellitus (DM) and improve the quality of life for all persons who have, or are at risk for, DM” (p.1). Although most of the patients in the rehabilitation facility are admitted due to various diagnoses and comorbidities, many share the common disease of diabetes and require ongoing treatment. Before discharging home, patients with diabetes must be under glycemic control along with all other medical management. The rehabilitation facility is a great place to accurately educate the patient and family on the importance of proper diabetes management and provide them with necessary resources (Musekamp, Gerlich, Ehlebracht-König, Faller, & Reusch, 2016).

Problem Statement

Diabetes is the seventh leading cause of death in the United States (Watson, Bluml, & Skoufalos, 2015). It is estimated that nearly 26 million Americans are affected by diabetes (Watson et al., 2015) and that around 6.2 million people have diabetes but are “undiagnosed at this time” (Madden, Loeb, & Smith, 2008, p. 2243). By the year 2025, it is estimated that approximately 300 million people worldwide will be affected by diabetes, either by being diagnosed with diabetes or pre-diabetes (Madden et al., 2008). Diabetes can turn into a financially exhausting disease. In 2012, the approximated total expenses for diabetes care in the United States was \$245 billion dollars, this amount included the cost of all expenses for diabetes (U.S. Department of Health and Human

Services, 2010). Diabetes is a disease that individuals should try first to prevent, but if they are diagnosed with it, they should try treating in the early stages. If diabetes is left untreated, it can lead to severe health repercussions such as renal or cardiovascular issues, blindness, or limb amputation (Watson et al., 2015). A major challenge faced by the healthcare team is helping the patient gain “good glycemic control” (Pan et al., 2016, p.17) while also trying to avoid hypoglycemia. My project site previously did not have a diabetes management protocol set in place and often struggled with management of glycemic control of its diabetic population.

Reports have shown that diabetes is noted on numerous death certificates (American Diabetes Association, 2016). Researchers have found that only about 35% to 40% of people with diabetes who expired had diabetes listed as a diagnosis or cause of death on the death certificate, and about 10% to 15% had it listed as the underlying cause of death (ADA, 2016). The focus of this doctoral project included the planning of an evidence-based and sustainable diabetes management protocol for the project site. The lack of a standardized, evidence-based, and consistently implemented protocol may lead to a decrease in patient safety, increased lengths of patient stay, and overall decrease in quality of patient care. The implementation of a standardized diabetes management protocol in the inpatient rehabilitation facility will help to increase overall quality of patient care, allowing patients to discharge with their disease process better managed. Further, such implementation will decrease readmission rates to the acute care and inpatient rehabilitation facility.

Purpose Statement

The purpose of the quality improvement project was to develop a standardized evidence-based diabetes management protocol that would be appropriate for all adult patients in the inpatient rehabilitation setting. Protocols and order sets should be developed to guide the management of hyperglycemia and hypoglycemia throughout the hospital (American College of Endocrinology and American Diabetes Association, 2006). Although the facility previously had a hypoglycemia protocol in place, there was not a standardized protocol for all patients who are either experiencing hyper- or hypoglycemia. Further, there was no standardized order sets in place for physicians to manage diabetic patients.

Diabetes is an epidemic that will continue grow in coming years. Researchers with UnitedHealth estimated that by 2020, the number of adult Americans with pre-diabetes would increase to 135 million, accounting for almost half of the U.S. population (Rowley, Bezold, & Arikan, 2016). The cost of diabetes in 2015 dollars was estimated to have increase by 53%, soaring up to \$622.3 billion dollars by 2030 (Rowley et al., 2016). It is critical for all healthcare providers in the rehabilitation setting to learn to educate all patients on proper diabetes management and signs and symptoms because so many patients are not aware they are in the pre-diabetic phase. Part of the standardized protocol includes screening all patients who arrive at the facility for diabetes and pre-diabetes. The protocol also includes not only methods of treatment, but also education for the patient and family. Education is such an important factor in diabetes management because

patients and families need to be well educated on disease management to adequately care for the patient at home upon discharge.

Screening can take place through a variety of means. There are three types of diabetic screening tools that were proposed to be used for the project. The Problem Areas in Diabetes (PAID) questionnaire is a 20-item questionnaire that is used to test patients on psychosocial and behavioral factors including general emotional state, diabetes self-care, daily coping, and health beliefs (Eigenmann, Colagiuri, Skinner, & Trevena, 2009). Researchers and practitioners also use scores from the PAID questionnaire tool as predictors of patient glycemic control. Questionnaire scores range from 0-100 and are scored on a 5-point scale (Eigenmann et al., 2009). The Appraisal of Diabetes Scale (ADS) is a brief screening tool that is beneficial in the busy rehabilitation setting because it can easily be performed in 5 minutes. The ADS tool consists of seven questions, while a lower score represents a positive appraisal of the diabetic patient (Eigenmann et al., 2009). Positive scores have been shown to link to successful patient glycemic control and contributing to patients participation efforts in diabetes educational plans (Eigenmann et al., 2009). I determined that the Summary of Diabetes Self Care Activities (SDSCA) would be the best tool to use to measure patient outcomes for this project. The SDSCA is a comprehensive measure of self-care behaviors of the diabetic patient. The SDSCA tool has been used for many studies on diabetes self-management education for the standardized evaluation of quality improvement interventions for type 2 diabetes mellitus (Eigenmann et al., 2009). The SDSCA tool assesses patient diet, exercise, blood sugar levels, foot care, and smoking habits. The SDSCA is used as a constant measure to

determine if patients are showing improvement in disease management at different times (Eigenmann et al., 2009). Assessment items are scored 1-10, using the days per week on a scale of 0-7. The SDSCA is a beneficial tool to use in the rehabilitation setting as a continuous patient monitor since the normal length of stay for most patients is 10-14 days. I measured project outcomes using a combination of the described screening tools.

Goals and Objectives

The goal of this quality improvement project is to reduce the incidence of glycemic events. A standardized diabetes management protocol will benefit both the facility and the success outcomes of patients. Currently, many patients require longer lengths of stay because of complications from diabetes or diabetes management. One goal of the quality improvement project was to have a standardized method of treating patients. With a standardized method in place, all physicians and healthcare providers can function on the same level to establish and achieve patient goals for medical management and discharge. Guidelines on measuring and tracking A1C levels, patient medications, and nutrition plans will serve as the basis for the intended facility protocol. The American Diabetes Association (2016) recommends an A1C of 7%, which is an estimated average glucose (eAG) of 154 mg/dl. Glycemic goals should be set in place and individualized for each specific patient.

The National Guideline Clearinghouse is a public resource for summaries of evidence-based clinical practice guidelines. The National Clearinghouse Guidelines (2016) include guidelines and resources pertaining to type 2 diabetes mellitus including those for screening processes, nutrition, education protocols, and advancements. I

incorporated information from these evidence-based guidelines as I developed the diabetes management protocol goals and objectives for this DNP project. Objectives for the quality improvement project included a standardized protocol, standardized order sets, and incorporation of diabetes education plans for all patients. Project objectives included creation of a standardized medical management protocol for diabetes patients in the rehabilitation setting. Under this protocol, patients would be screened upon admission using one or all of the screening tools. Upon discharge, patients would potentially show an increase in disease management and self-care behaviors. Outcomes can be measured by continuation and follow up throughout the patients' stay within the facility using the scores on the screening tools.

Evidence-Based Significance of the Project

There was a need for a standardized management protocol and education plan at my project site so that patients can learn how to adequately manage their diet, exercise regimen, medication regimen, lifestyle, and other activities of daily living. I gathered evidence for this project by reviewing the existing literature, which I graded and analyzed according to what was most appropriate for this particular project in the rehabilitation setting.

Implications for Social Change in Practice

Many patients who enter the rehabilitation facility are not able to discharge within established timeframes because their diabetes is not well controlled. Patients are unaware of the fact that they even have this disease until a traumatic medical event occurs, which leads them to the acute care facility and then to the rehabilitation facility for further

treatment and restorative care. A collaborative and interdisciplinary team approach to diabetes education helps to increase the success rates of diabetic patients by helping to decrease the rate of glycemic events. Results of educational efforts demonstrated that glycemic events are more accurately maintained and well managed by patients to a normal level per facility values. Researchers have shown that in many cases diabetes patients are more concerned about physical limitations of the disease than internal limitations (Wu, Tung, Liang, Lee, & Yu, 2014). Education should focus on the importance of how those internal factors lead to external issues. Social change can result from establishing a protocol that enhances patient education that patients can continue to utilize when discharged into the community.

By controlling diabetes in this population, patients will return to a better state of self-reliance. It is estimated that 90% of individuals with diabetes obtain their management without reliance on specialists or primary care physicians (Mazze, 2008). Although patients need to be independent in their diabetes care and management, they also need expert advice and medical guidance. An independent learning environment and fostered educational program leads to social change by re-establishing a safe medical compliance ground for patients while also helping them to regain their independence in diabetes care management. Patients at my project site may impact other patients with diabetes by sharing their newfound knowledge.

Definitions of Terms

I used the following definitions of terms throughout this project:

Diabetes mellitus type 2: In type 2 diabetes, the body does not use insulin properly. This is called insulin resistance. At first, the pancreas makes extra insulin to make up for this deficiency. But, over time it cannot keep with the lack of insulin and cannot make enough insulin to keep the body's blood glucose at normal levels (American Diabetes Association, 2016). Type 2 diabetes is the most common form of diabetes.

IOWA model: The IOWA model of evidence-based practice (EBP) was developed by Marita G. Titler to describe knowledge transformation and to guide implementation of research into clinical practice. The IOWA model takes the entire healthcare system into consideration when developing important clinical and patient decisions (Dontje, 2007). The first step in the IOWA model is to identify a need for change that is either problem- or knowledge-focused (Dontje, 2007).

HgA1C: Hemoglobin is a protein in red blood cells. Its job is to link up with sugars such as glucose. Red blood cells carry oxygen to cells throughout the body. Glucose enters red blood cells and attaches with molecules of hemoglobin. The hemoglobin becomes more glycated depending on the amount of glucose that is present in the blood. By measuring the percentage of A1C in the blood, the provider can obtain an overview of the patients' average blood glucose control for the past few months. The American Diabetes Association (2016) recommends administering an A1C test at least bi-annually.

Assumptions and Limitations

Assumptions

I made several assumptions in this EBP project. The first was that the incorporation of a standardized diabetes management protocol at the inpatient rehabilitation facility would increase patient success rates and decrease readmission rates in the future. The second was that the standardized protocol must contain a combination of factors such as nursing protocols for glycemic management, standardized physician order sets, and educational experiences for both patients and families while at the facility to achieve optimal diabetes management. I also assumed that patients, families, and providers are willing to abide by and follow the protocol.

Limitations

One limitation of the project is that the practicum facility is a very small inpatient rehabilitation facility with only 50 patient beds. Given this small size, my project may not be generalizable to larger facilities. State regulations on inpatient rehabilitation facilities may also vary from state to state. To qualify for inpatient rehabilitation, patients must be determined to have a medical necessity at the time of admission (Centers for Medicare & Medicaid Services, 2017). To qualify for inpatient services, the patient must require active and ongoing intervention of multiple therapy disciplines (Centers for Medicare & Medicaid Services, 2017).

Summary

In this section, I presented an overview of the EBP project on the need for a diabetes management protocol at the inpatient rehabilitation facility. Diabetes is a disease

that must be managed using a teamwork approach. As Kent et al. (2013) have noted, “Optimal diabetes management requires an organized, systematic approach and the involvement of a coordinated multidisciplinary team committed to patient-centered focus for improved health outcomes” (p. 76). For the implementation of the EBP project to be successful, each member of the rehabilitation team must play a role in medical management and educational needs of each patient.

Section 2: Review of the Scholarly Literature

Introduction

My primary goal for this DNP project on diabetes management was to develop a standardized protocol in the rehabilitation setting that will be set in place to manage all patients with diabetes in the facility that served as my project site. Care providers at the facility could use the standardized diabetes management protocol to manage patients from not only a medical standpoint, but also from an educational perspective. The implemented protocol would include aspects of teaching for both patients and family on proper nutrition, daily exercise regimens, community assistance, and financial funding. A standardized diabetes management protocol would be aimed at providing patients holistic care. I completed a comprehensive review of scholarly literature to identify best practices for diabetes management and caring for the diabetes patient holistically. In this section, I examine the scholarly literature regarding diabetes, including its history, clinical features, etiology and risk factors, prevention and management, and the organizational approach from similar facilities used for addressing diabetes.

Literature Search Strategy

I conducted the literature search for this DNP proposal mainly using the electronic resources available from Walden University Library. Specifically, I searched the following databases: Medline, Cumulative Index for Nursing and Allied Health Literature, and PubMed. I also used several books assigned from my DNP courses. Articles included studies that were conducted in rehabilitation or nursing home settings that dealt with diabetes management issues daily. Main search terms included *diabetes*,

diabetes management, type 2 diabetes, IOWA model, rehabilitation, education, nutrition, exercise regimen, interdisciplinary, protocols, insulin, basal, and medical management. I combined these terms in a variety of ways using Boolean searches to help to advance the literature search. I found hundreds of articles on diabetes protocols, which I had to narrow down to fit the project topic. Ultimately, I selected 45 articles to include in the literature review.

Concepts, Models and Theories

The logic model is often used as a framework for program designs. Its purpose is to estimate how the program may succeed in the end (Hodges, & Videto, 2011). This model can be represented in a visual way to explain the program to others such as the staff, stakeholders, committee members, and so on. (Hodges et al., 2011). Predictors of the logic model can include activities, program inputs, and short- and long-term goals of the program (Hodges et al., 2011). The logic model can help to forecast budgeting and financial aspects of program design, in turn helping to redirect program goals and objectives if financial resources are not available.

I determined that the logic model could be used for this program to help communicate its foundation to not only staff in the facility, but also to patients and families so that they will be able to understand the intentions of the program. Intentions of the program are that the patients will leave the facility feeling more independent and able to care for themselves and manage this disease process on their own at home along with other co-morbidities that they may have. For an implementation to be cost effective, it must change behavior (Thompson, Pulleyblank, Parrott, & Essex, 2016). Using this

model not only changes patient behavior but also the behavior of the staff by fostering a team approach to patient care and educational methods. By using the logic model stakeholders at the project site were able to visualize displayed goals of the program. The facility has a quick turnover for patients, and some patients may only stay 10-14 days or less during their established time depending on the success of their therapy. Logic models are designed to illustrate strategies that can be short-term or immediate (Allmark, Baxter, Goyder, Guillaume, & Crofton-Martin, 2013).

By using the logic model, I was able to display goals and make changes to the program based upon previous admissions. The use of visual diagrams can aid in finding the root cause of a problem and aid in solving the solution (Siriwardena, & Gillam, 2013). By learning from and building on previous patient experiences, those using the program can continually improve it. Those using this program will learn to synthesize all previous patient experiences with diabetic patients, while helping to improve future experiences (Allmark et al., 2013). Program inputs and suggestions from patients and family members can also be displayed for all team members to take into consideration. Inputs can also be expanded to help stakeholders determine cause and effect relationships between diabetes education and patient success rates (Siriwardena et al., 2013).

A logic model is a “systematic and visual way to present and share your understanding of the relationships among the resources you have to operate your program, the activities you plan to do, and the changes or results you hope to achieve”(Campbell et al., 2015, p. 585). Inputs in the logic model can include staff, workers, or other resources that may be needed during the program design phase

(Contento, 2008). Outcomes refer to the impacts of the program design, which could potentially be short- or long-term (Contento, 2008). The logic model helps to visualize that many different factors are important when implementing a program design. This model also shows that the environment is an important factor that can either help to facilitate or inhibit program design in some cases (Contento, 2008).

Theoretical Foundation

I used the IOWA model for EBP to guide project development (Doody & Doody, 2011). The IOWA model promotes a strategic approach to practice change that ensures input, competency, and leadership (Doody et al., 2011). Methods included a literature search, national guideline reviews, review of literature from the American Diabetes Association and International Diabetes Federation. Methods also included (a) rating of existing evidence, (b) development of a diabetes management policy protocol for the project at the project facility in line with national and high-level evidence, (c) development of nursing education for staff, (d) development of patient and family member educational materials, (e) scheduling of stakeholder meetings to gather input from staff, and (f) assessment of stakeholder satisfaction with DNP student's leadership/project management of the practice-change initiative. EBP models can support an organized approach to implementation of EBP projects, prevent incomplete implementation, improve use of resources, and facilitate evaluation of outcomes (Schaffer, Sandau, & Diedrick, 2013). Researchers have found the IOWA model useful in a wide variety of specialty areas, and particularly appropriate for the rehabilitation setting (Schaffer et al., 2013).

Relevance to Nursing Practice

Continuing education is a common technique used to improve clinical practice related to diabetes management (Paul et al., 2013). Paul et al. (2013) found within his research findings that the protocol they developed helped a similar facility to incorporate weekly educational classes for diabetic patients and families. Many of these patients were long time diabetic patients, while others were newly diagnosed. The class members had varying levels of needs for education, but all had the same diagnosis. Growing evidence has shown that increased and varied exposure to clinical educational materials improves overall patient outcomes (Paul et al., 2013). The educational piece of the diabetes management of the protocol was implemented within the facility. Classes were offered to the patient population multiple times during their stay within the rehab facility, along with the means of various teaching approaches. Although classes were held weekly, patients and families had the opportunity to participate in the educational opportunities as many times as they chose. The management of diabetes patients requires a great deal of knowledge and expertise in practice, for which nurses are responsible for (Engvall et al., 2014).

Glycemic management protocols should focus on glycemic control as the treatment target because glycemic management is related to successful patient outcomes (Hsu, 2012). Successful outcomes for diabetes patients can be achieved through incorporation of EBP models and theories in the needed protocol. Correction and stabilization of hyper- and hypoglycemia can be achieved by following a standardized of clinical practice (Hsu, 2012).

Local Background and Context

Diabetes can present differently for each individual depending on the type that they present with; about 85-95% of diabetes cases are type 2 (Ramachandran, 2014). One in two adults with diabetes is undiagnosed, and many patients who are eventually diagnosed with diabetes often experience no symptoms and go undiagnosed for an extended period (IDF, 2017). Some patients do not discover medical symptoms yet display symptoms of depression, which is what warrants a trip to their primary care giver (Hannon, Rofey, Lee, & Arslanian, 2013). Many patients with type 2 diabetes often go undiagnosed for many years because elevated blood glucose levels are not consistently high enough to elicit the classic signs of diabetes (Fain, 2009). The estimated length of time between the onset of hyperglycemia and the diagnosis of type 2 diabetes spans from 9 to 12 years (Fain, 2009). Researchers have found that patients with undiagnosed diabetes and depressive symptoms are often found to be noncompliant with a healthy diet and exercise regimen upon evaluation by a primary care provider (Katon, Russo, Heckbert, Lin, Ciechanowski, 2010). I used the PAID questionnaire tool in this area of this project because it can be used to screen patients who are being admitted into the facility on psychosocial and behavioral factors. These ratings, along with their other ratings in the various categories, may indicate the need for diabetes management.

Diabetes is a disease that requires adherence to a complex regimen that includes medications, glucose monitoring, exercise, and a strict diet that consists of vegetable consumption and reduction of simple carbohydrates (Grzywacz, Arcury, Saldana, Kirk, Bell, 2012). When a patient consumes a food that contains a carbohydrate, the digestive

system breaks down the carbohydrate into sugar, which then enters the blood stream (Harvard School of Public Health, 2017). Simple carbohydrates are composed of sugars such as fructose and glucose (Harvard School of Public Health, 2017). These simple carbohydrates can have a negative effect on the health of a diabetic patient by causing a faster rise in glycemic levels, along with increased insulin production (Harvard School of Public Health, 2017). The World Health Organization (WHO) has estimated that 90% of all type 2 diabetes could be prevented by eating a healthy diet, increasing physical activity and avoiding smoking (Andersson & Bryngelsson, 2007). A diet that consists of fruits and vegetables has proven to have positive effects on blood sugar by maintaining a healthy digestive tract (Harvard School of Public Health, 2017). According to the Diabetes and Nutrition Study Group of the European Association for the Study of Diabetes, patients with type 1 diabetes and nephropathy should also reduce protein intake (Andersson et al., 2007). More evidence is needed to establish the effects of high-protein diets on renal function and to confirm the extent to which red meat and processed meat contribute to the development of nephropathy (Andersson et al., 2007).

There are three classic symptoms of diabetes, which include polyuria, polyphagia, and polydipsia (Ramachandran, 2014). These three signs are most common in type 1 along with severe weight loss (Ramachandran, 2014). These three classic signs can also be present in type 2 if the disease goes undiagnosed for a long period of time (Ramachandran, 2014). There are common signs of undetected diabetes that include body aches, restlessness, fatigue, and unexplained weight loss (Ramachandran, 2014). Type 1 diabetes is the result of the body's immune system response to fighting infection by

attacking and destroying the insulin producing beta cells (National Institute of Diabetes and Digestive and Kidney Diseases, 2017). Type 2 diabetes is linked to lifestyle and genetic factors. Obesity can play a major part in type 2 diabetes because fat cells require more insulin to allow glucose to enter the cells of the body (National Institute of Diabetes and Digestive and Kidney Diseases, 2017). In the beginning stages of diabetes, the pancreas produces more insulin to keep up with the added requirements, but as time goes by the pancreas cannot keep up with these requirements so blood glucose levels tend to rise (National Institute of Diabetes and Digestive and Kidney Diseases, 2017). In many cases, patients interpret and act on their symptoms according to cultural beliefs and personal factors (Coffman, Norton, & Beene, 2012). Signs of diabetes can often mimic other illnesses which is why it is so common for the disease to go undiagnosed for extended period.

Diabetes type 1 is most commonly diagnosed in children and adolescents, and it presents with the classic trio symptoms of polyuria, polyphagia, polydipsia, and accompanying hyperglycemia (Atkinson, 2012). These three classic symptoms begin as a cycle in the presence of increased blood glucose levels. When the blood glucose levels are increased, the kidneys are unable to reabsorb all of the excess sugar in the blood, which ends up in the urine. This is where excess body water is lost and polyuria develops (Mikesh, 2016). Polyuria leads to dehydration and increased thirst, also known as polydipsia (Mikesh, 2016). The lack of insulin leads to poor absorption of blood sugar in the body tissues and muscles which leads to decreased energy and body fatigue (Mikesh, 2016). This accounts for the common signs of body aches, restlessness, and fatigue

(Ramachandran, 2014). This process leads to increased hunger, known as polyphagia (Mikesh, 2016). Type 1 is an autoimmune disease where the body begins to destroy its' own beta cells (University of Maryland Medical Center, 2017). Symptoms of type 1 are usually more sudden in onset and more severe than the symptoms of type 2 (University of Maryland Medical Center, 2017). Type 1 is much less common than type 2.

Type 2 diabetes is the most common form of diabetes (University of Maryland Medical Center, 2017). In type 2 diabetes, the body does not properly respond to insulin, which results in a decline of beta cell function in the body which can begin as early as 12 years before any clinical signs present (Fonseca, 2009). Beta cells store and release insulin. If their function begins to decline, a worsening of insulin resistance in the body presents (Fonseca, 2009). Clinical features of type 2 diabetes are usually gradual and progress slowly. Symptoms of type 2 diabetes include “excessive thirst, increased urination, fatigue, blurred vision, weight loss, gum disorders, itching, erectile dysfunction in men, vaginal or yeast infections in women, and tingling or burning sensations in extremities” (University of Maryland Medical Center, 2017, p. 10).

There are arrays of factors that can impede glucose control within an inpatient setting to include: physician's orders, patient's knowledge, background and medical history, nurses' interpretation, knowledge and experience, and patient length of stay within the facility (Salamah, Byxbe, Naffe, Vish, DeJong, 2011). In the rapid changing healthcare setting, physician's orders are constantly changed. Diabetes management orders are changed first from the management system that the patient was using in the home setting, from the acute care setting, then once again in the rehab setting. Clear

communication with outpatient providers is needed via discharge or transfer to outpatient facilities (American Diabetes Association, 2017). The Agency for Healthcare Research and Quality (AHRQ) recommends that at a minimum, discharge plans include the following: medication reconciliation, a planned and structured discharge communication plan, along with a detailed summary (American Diabetes Association, 2017). These items will increase outpatient facility knowledge and patient knowledge while leaving open, clear lines of communication for patient education.

The ADA recommends a pre-prandial glucose level of 70-130 mg/dL for adults with type 2 diabetes (Salamah et al., 2011). If patients experience rapid changes in blood glucose levels while in the inpatient setting this increases their risks for heart attack, stroke, infections and slow healing wounds (Salamah et al., 2011). Hyperglycemia caused by diabetes can lead to insufficient tissue perfusion which is detrimental to wound healing (Gou & DiPietro, 2010). Increased blood glucose levels can also impair angiogenesis, leading to neuropathy which can contribute to diabetic foot ulcers (Gou et al., 2010). Patients diagnosed with diabetes are often diagnosed with increased low-density lipoprotein cholesterol, decreased high-density lipoprotein and increased triglycerides (American Heart Association, 2017). This triad of a poor lipid count oftentimes occurs in patients with diabetes and leads to coronary artery disease (American Heart Association, 2017). This deadly combination leads to the formation of atherosclerosis. The formation of plaque buildup in the arterial walls reduces blood flow and oxygen supply to cells, increasing the risk of stroke and heart attack (American Heart Association, 2017).

The use of sliding scales or mathematical calculations can be used to cover patients within the inpatient setting. One problem with existing sliding scale protocols in inpatient facilities is that patients either refuse their insulin or nurses miscalculate dosage rates (Salamah et al., 2011). Sliding scales are implemented in many facilities due to convenience of coverage. Traditional sliding scale orders are implemented as a standardized protocol that the nursing staff is able to oversee. They do not normally have to notify the physician unless the patient is severely hyper or hypoglycemic. Sliding scale protocols do not always take into account for patient weights, previous insulin histories or sensitive's, or nutritional status (Nau, Lorenzetti, Cucuzzella, Devine, Kline, 2010). Sliding scales are shown to lead to harmful variations in blood glucose and insulin levels which create oxidative stress, endothelial dysfunction, and increased markers of inflammation (Nau et al., 2010).

Other problems can include that patients are missing or skipping bedtime snacks, causing hypoglycemia. The night hours while the patient is sleeping is considered to be an extended fasting period when the liver is mainly responsible for maintaining accurate blood glucose levels, this is impaired in the diabetic patient (Kinsey & Ormsbee, 2015). Bedtime snacks that consist of cornstarch or protein have been the most useful in reducing hypoglycemic events but all snacks should be patient specific (Kinsey et al., 2015). The consumption of no bedtime snack shows the results for the greatest hypoglycemic events (Kinsey et al., 2015). Staff are encouraged to educate patients on these important issues, thus where the doctoral project is needed in the facility (Salamah

et al., 2011). Many patients within the facility are not properly educated on the need for medical management due to the lack of knowledge deficits.

Role of the DNP Student

I am familiar with this project facility after previous completion of clinical hours for my master's program at this site. I reviewed current literature on EBP on ways to best educate patients and families within the facility on diabetes management. My role also includes role of educator, as the student lead classes for staff, patients and families during the project. I held stakeholder meetings, while gathering input from staff and the interdisciplinary team. I took on the role of analyzing results and outcome measures, while also reporting results back to the team members of the facility. My motivation for this project is that this topic is of great interest me and also a great need for a quality improvement project for the facility.

Interdisciplinary Project Team

The rehabilitation facility is the selected project site and practicum facility for the DNP project. This site functions very well as a collaborative unit as all disciplines must work together to care for the patients in the facility in order to provide patient success for discharge home and out into the community setting. According to Fulmer, "Good team care means demonstrating appropriate values and ethics for interprofessional team practice, knowing the roles and responsibilities of team members for collaborative practice, demonstrating strong interprofessional communication skills, and practicing interprofessional teamwork and team-based care that advances the patient's and family's well-being" (Fulmer, 2016, p. 66).

There are many various internal stakeholders that were involved in the planning process of the diabetes management protocol. Direct stakeholders include facility CNO, Director of Quality/Risk Manager, hospital educator, dieticians, director of pharmacy and infection control nurse practitioner. These direct stakeholders can be considered to be the frontline committee for the protocol project. One of the primary goals of the rehabilitation team is to decrease inpatient length of stay and to discharge patients back into the community setting (Johnson, Smith, & Wilkinson, 2015). These frontline stakeholders played a part in the planning phase of the protocol as they offered input and suggestions on important protocol factors and educational topics. Other internal stakeholders at the facility are other staff members such as therapists (to include speech, occupational, physical), case managers, nurses, etc., as they all played a direct part in patient care involvement. Collaboration is considered to be the epitome of success (Brunarski, Shaw, & Doupe, 2008). All stakeholders and disciplines must work together in order to promote a successful project outcome. Patients of the diabetic population within the rehabilitation setting can also be considered to be stakeholders as they have a direct input and voice in their own care and voice for others of their disease population. External stakeholders include family members of the diabetic population within the rehabilitation facility and those throughout the community.

The project site is a 50 bed inpatient facility so there is a way that everyone is able to become involved. There are many strategies that can be implemented to facilitate stakeholder involvement. The Director of Quality/Risk Management helped to facilitate/oversee all meetings that pertained to the facility protocol. The hospital educator

plays a large role in the aspect of coordinating and facilitating patient and family education. Part of the protocol consists of educational plans and programs that required all discipline roles to educate patients on the importance of exercise, nutrition, medical management, compliance, etc. The staffs were required to work together as a team in order to establish the facility protocol and obtain successful glycemic ranges while in house but also establish lifelong habits for patient futures. Stakeholders must communicate regularly amongst each other in order for project efforts to become successful (Brunarski, et. al, 2008). Efforts can be made possible through planned meeting times, emails, conference calls, etc.

Prevention and Management of Diabetes

At present, type 1 diabetes cannot be prevented due to the autoimmune response of the body (International Diabetes Federation, 2017). This type of diabetes exists when the body's defense system attacks against the cells that produce insulin (International Diabetes Federation, 2017). Early education for those at high risk and prevention of diabetes is the best method of managing and decreasing the likelihood of the disease. One of the biggest problems with diabetes is that it is so misdiagnosed. One of the best prevention methods is early educational efforts. Educating those at high risk on the importance of a healthy diet, medical compliance and activity modifications may help to decrease their likelihood of developing the disease (American Diabetes Association, 2016).

Lifestyle interventions should be implemented that focused on weight loss, incorporation of a healthy diet, and promoting physical activity (Rawal, Tapp, Williams, Chan, & Yasin, et al., 2012). Nutrition is a very big part of diabetes prevention and management after being diagnosed with the disease. A study on type 2 diabetes discovered that a diet low in carbohydrate and sugar helped to achieve more stable blood glucose readings than simply following a low fat diet (Tweed, 2016). Harvard researchers suggest that in the prevention and management of diabetes, individuals should get enough sleep each night, which could be a different amount for each person (Tweed, 2016). Type 2 can be easily preventable through lifestyle choices and modifications (Patón, 2016). Since type 1 diabetes is thought to be more genetically predisposed, lifestyle choices and modifications may not be as effective in the prevention of the disease but should certainly be used to help manage it (Patón, 2016).

Patients admitted to the rehabilitation facility are medically complex. Those who have diabetes are often admitted with unstable blood sugar levels related to illness, recent surgery, or tube feedings (Mader, Fuglee, Allen, Werner, & Wanlass, 2006). Recent illness or stress can contribute to increased blood glucose levels as hormones in the body are produced as a response to ward off the illness or stressor (Mayo Clinic, 2017). Often times, patients who are not diagnosed as diabetics experience periods of hyperglycemia when exposed to recent illness or stress (Mayo Clinic, 2017). In regards to capillary blood glucose testing (CBG), the ADA recommends that for patients managing their disease process through diet modification only or through the use of an oral agent that testing should be performed before breakfast and evening meals up to three days a week

(Mader et al., 2006). For complex insulin drug regimens the CBG should be tested before each meal and at the hour of sleep (Mader et al., 2006). When and how often to check patient CBG within the rehab setting will be a part of the project protocol. Patient medication history is important as patient testing will be dependent upon the type of medication regimen that the patient is currently on or may be added to during their length of stay within the facility.

Organizational Approach

In order to educate the diabetes community and those who are at risk, an initial organizational approach is needed. A teamwork approach is needed as an array of healthcare disciplines will be needed to care for and educate members of the diabetes community (Mazze, 2008). Community partnerships should be established to adequately care for and manage the diabetes patient for successful outcomes of care (McCann, 2010). In the rehabilitation setting, nurses, physicians, case managers, physical and occupational therapists care for the diabetes patient. Diabetes care has been taken on by a multidisciplinary approach for decades (Mazze, 2008). Hospital educators and infection control nurses help to further educate the diabetes patient on the management and treatment of their disease and its' processes.

Summary

The concept of diabetes has now existed for more than over 100 years. The development of diabetes has grown dramatically from the diagnosis, to treatment and prevention, including medication and technology advancements. Many factors have been discovered that put individuals at risk for developing diabetes such as genetic

predisposition, race, lifestyle and environmental factors. Diabetes can present different clinically depending on the type. Type 2 diabetes unfortunately often goes untreated for a longer period of time because its' symptoms can be gradual and progress slowly, making the disease harder to detect. All members of the healthcare team will need to work together using an interdisciplinary approach to care for and educate members of the diabetic population within the rehabilitation facility. All Americans should be educated on the importance of living a healthy lifestyle that includes a healthy nutrition plan, regular sleep pattern, daily exercise regimen, and medical compliance. The Logic Model can be used during program design to help visualize program design and incorporating evaluation methods.

Evaluation methods for patients included verbalization and return demonstration of medical management to include: medication preparation and administration, verbalization of nutrition management choices, verbalization and demonstration of exercise regimen. Family members were evaluated on discharge planning and care if patient will be discharged home with family care due to physical limitations or varying co-morbidities. Evaluation should involve as many stakeholders as possible (Reeves, Boet, Zierler, & Kitto, 2015). During the evaluation phase all stakeholders were involved in this process such as nurses during the medication phase, dietitians during the nutrition phase, therapy during the exercise regimen, etc. Case management members were offered the opportunity to be present during family training evaluation sessions.

Section 3: Approach

Introduction

The purpose of the diabetes management quality improvement project was to formulate a standardized evidence-based diabetes management protocol that will be appropriate for all adult patients in the inpatient rehabilitation setting while also incorporating educational programs for patients and families. The primary purpose of this project was to develop education and training for diabetic patients in the rehabilitation setting so that they could take their knowledge of the disease back to the home setting and the communities to more successfully manage their care. This section outlines the process for implementation, evaluation, and timeline of the project for diabetes management protocol and educational efforts and activities. The program consisted of standardized physician order sets/protocols, individualized patient educational plans and training classes for both patients and families on diabetes management and daily living. A table is provided to display program objectives, activities and goals.

Mission Statement: To develop successful diabetes management program for patients within the rehabilitation setting. The program will consist of standardized physician order sets/protocols, individualized patient educational plans and training classes for both patients and families on diabetes management and daily living. Program development fosters a sense of patient independence.				
Objectives	Action Plan/Activities	Goals	Evaluation Goals/Objectives	Evaluation Activities
To reduce glycemic events in the target population.	Successful glycemic values may be obtained through the incorporation of the various listed program and activities.	To achieve successful glycemic values in patients of the target population.	Patients and families will complete offered educational programs with adequate knowledge of how to care for the patient and manage the disease at home.	Return demonstrate of diabetic care management such as checking blood sugar, administering medications, knowledge of medication regimen, etc.
To increase knowledge and awareness of disease processes in the target population.	Incorporate educational programs on the importance of nutrition management, exercise, and medical compliance.	To provide educational support to patients and families.	Patients and families will gain valuable educational information on all aspects of disease management.	Return demonstration or verbalization of a formulated exercise and nutrition plan.
To reduce costs of diabetes management.	Offer community resources/support available to target population for financial funding to assist with medical management and pharmaceutical costs.	To provide financial support to patients affected by diabetes.	Patients and families will gain knowledge of available financial resources.	Verbalization of financial resources that patients and families know is available to them for disease management.

Figure 1. Timeline projection table.

Review of Evidence

The interdisciplinary team consists of leadership staff within the rehab facility. This team was assembled with members on a voluntary basis, which was more than happy to be a part of this project. The interdisciplinary team met at various times over the course of the implementation phase of the project. During these meetings, I provided team members scholarly literature, which I had reviewed, on the topic. Literature review helps to determine how deeply a topic has been explored (Ward-Smith, 2016). Specifically, I reviewed existing protocols in similar facilities in order to formulate a plan for design. Members assembled while contributing feedback and offering input on changes that needed to be made based on the needs of the facility. While reviewing the evidence, stakeholders noticed consistent or inconsistent facts in the evidence, prompting the team to change the design path of the program.

Team members should work consistently but also be able to function interchangeably if necessary (Allen et al., 2012). The facility already uses a team approach, but there is a need for a standardized approach to diabetes care. According to Godfrey and Magee (2009), “Collaborative, multidisciplinary teams are best suited to provide such care for people with chronic conditions, such as diabetes, and to empower patients’ performance of appropriate self-management” (p. 605). Implementing a successful protocol that entails not only medical but also educational factors requires the active participation of the entire rehabilitation team.

Develop the Diabetes Management Program

Education and Protocol Development

The diabetes management program contained several factors because by intent was to implement an actual standardized medical management protocol and also incorporate educational programs for patients and families in the facility. Protocol based guidelines help to align a facility's practices with EBP (Rycroft-Malone, Fontenla, Bick, & Seers, 2008). The facility already had a standard hypoglycemia protocol set in place. However, there was no standardized medical management protocol in place for care of the diabetic patient in the rehabilitation setting.

Educational Delivery Modalities

I designed and set in place a standardized medical management protocol based on EBP and best use from other similar designs used for patients in similar settings. Educational classes were offered weekly since the population varies and patient turnover in the facility is quick. Educational efforts included emphasis on medical management, nutrition, diet and exercise, and community resources once the patient is discharged. Patients with diabetes should be provided healthcare resources offered in the community for successful discharge (Wong, Breiner, & Mylopoulos, 2014).

Content Validation

I gathered the content of the educational material provided to patients and families during educational classes and activities from the scholarly literature I had reviewed. I designed the medical management protocol using a combination of elements from other

evidence-based protocols that practitioners had used in similar settings with similar populations.

Development of the Diabetes Management Protocol Implementation Plan

I developed the diabetes management protocol implementation plan in collaboration with the interdisciplinary team. Program implementation takes a great deal of planning (Hodges et al., 2011). Each member of the interdisciplinary team has a special role in providing care and implementing the program. Frontline staff such as physicians and nurses will play a role in implementing the medical management portion of the protocol. Physicians will use the standardized set of orders for diabetes management, and the nurses will implement these orders into everyday care for the patient. Other members of the team such as education, dietary, wound care, infection control, physical therapy specialists, were involved in the implementation phase because they played special roles during the educational processes. Each one of these listed disciplines held a role during the daily/weekly educational classes to inform the patients and families on the importance of education and each of these individual educational factors when the plan was implemented.

Evaluation Plan Development

Evaluation is “the systematic collection of information about the activities, characteristics and outcomes of programs to make judgments about the programs, improve program effectiveness and/or inform decisions about future program development” (Hodges et al., 2011). Evaluation should take place constantly throughout program design. I used the logic model for evaluation since it enabled visual

representation of the program factors. Since many patients are only in the facility for a limited time, suggestions regarding the plan of care must be made quickly by providers. In this instance, stakeholders used the logic model to view changes that may be necessary to help the diabetes population in the facility. Stakeholders and programs designers can use the logic model to decide if changes should be made to the medical management protocol or if activities should be modified into the educational programs/classes (Reeves et al., 2015). Ongoing reporting and evaluation took place throughout the program design to maximize success. Activities and educational programs were to be patient specific in some cases because every diabetic patient is not going to present in the same manner.

Summary

Diabetes is a devastating disease that if left untreated can lead to vast complications, leaving patients impaired and unable to cope with complications. Diabetes can be managed through educational means of proper diet, nutrition and exercises classes. Diabetes can also be well managed through proper medical intervention and compliance. The intention of this quality improvement project was to standardize a means of caring for diabetic patients in the project facility while educating patients, staff, and family members along the way. The quality improvement process was implemented by the means of an interdisciplinary approach, which involved each team member in the rehab setting playing a unique part in the care and education of the diabetic patient. Each diabetic patient is unique, and all staff members must work together as a team in order to evaluate program effectiveness.

Section 4: Discussion and Implications

Introduction

This quality improvement project was designed to answer the question, “Does the implementation of a standardized diabetes management protocol in the rehabilitation facility result in reduced glycemic events?” The goal of the project was to reduce the incidence of glycemic events. Goals of the project included: treating patients, achieving successful glycemic values in patients of the diabetic population, and providing educational support to patients and their families.

The first step of the quality improvement project was to gather data from staff interviews on what specific steps should be taken when formulating these protocols and education plans for the diabetic patient modules. I interviewed key staff members of the facility and those who hold positions on the leadership team to collect input on how the quality improvement process should begin. I analyzed interview data using a thematic approach. Next, I worked to educate all staff members on the diabetes education program that would soon be presented to patients and families. The leadership team members felt that all staff members at the facility should be well-versed in the educational materials that were to be presented. I created a PowerPoint presentation to use as tool for diabetes education classes. I first presented this PowerPoint presentation as a learning tool to all staff members to obtain feedback, and then presented it to patients and families of the diabetic population. Literature shows that there is a need for additional diabetes educational training, both for patients and clinical staff members (Carney, Stein, & Quinlan, 2013). The project was completed over a 2.5-week period.

Findings and Implications

A total of 216 staff members had the opportunity to participate in the staff educational portion of this quality improvement project. The total number included bedside nurses, physical and occupational therapists, therapy assistants and aides, pharmacy and dietary staff members, leadership staff, and even maintenance and housekeeping staff. Of this total number, 80 staff members chose to participate, which was 37% of the staff. A large portion of the clinical staff members are (PRN) “pro re nata” staff and are not at the facility on a regular basis. The term PRN stands for “pro re nata”, which is a Latin phrase that stands for “as needed” (Haring, 2017). Many of the management, administrative, and housekeeping, and maintenance staff members also did not participate in the classes. Educational classes were held several times during the week for patients and families of the diabetic patient population, with a 100% attendance from patients. Follow-up individual patient and family education was offered to patients who were of the new diabetic population. The serious complications of diabetes may be prevented with proper educational efforts and medical management by the diabetes care team (Hall, Fong, & Cheng, 2012). The educational PowerPoint I created covered generic teaching topics such as types of diabetes, complications, proper foot care and wound management, proper nutrition and regular exercise, symptoms of hyper- and hypoglycemia, types of insulin and characteristics of insulin, instructions on preparing and properly administering insulin. Educational approaches for staff should concentrate on raising awareness of a multidisciplinary approach to team work while promoting a shared vision for the future of healthcare for diabetes (Hayes, 2009).

Data Collection and Analysis

I completed data collection in a 2.5-week period between 8/22/17 and 9/7/17. I performed a thematic analysis of staff interview data to search for trends in responses. Interview data may be helpful in identifying trends and further identifying necessary categories for research (Andrade Dias, Alves Rodrigues, Nogueira Sales, Meira Oliveira, & Gonçalves Nery, 2016). All interview respondents agreed that patients and families would benefit most from educational classes because lack of knowledge and noncompliance is one of the biggest reasons for readmission. Many patients are noncompliant simply because they have never received the proper education or tools to manage their diabetes (Peters, 2012). All respondents also agreed that no specifically strict medical protocol could be set in place for all diabetic patients for varying reasons. Respondents were able to agree on not setting a strict medical protocol in place because patients of the diabetic population have varying medical conditions and comorbidities, and thus need various types of medical management. Throughout the interviews, participants suggested that a generalized order set could be created for the diabetic population to include: a consistent carbohydrate diet, glucose checks before meals and at bedtime, A1C on admission if one was not performed by the transferring acute care facility, CMP and CBC on admission and then twice a week, and continuing implementation of the existing hypoglycemia protocol. Core components of a standardized order set will increase the accuracy of documentation and coding for all healthcare providers on the interdisciplinary team (Magee, 2007).

Results

Staff interview questions consisted of questions regarding how an educational class for patients and families should be formulated, what topics should be covered, how often the class should be held, and how these topics should be reinforced. Questions also focused on the topic of implementing a standardized medical management protocol and physician order set for the diabetic population. Patients' blood sugar trends were tracked using the facilities electronic health record system. Pertinent information from the patients' electronic medical record can be extracted to predict particular clinical outcomes (Golinko et al., 2009). I offered patients opportunities to come to the class as many times as it was held over the course of the project period to gain information. Behavioral programs focused on weight loss, physical activity, and interventions have been proven to benefit patients with poor glycemic control (Pillay et al., 2015). The educational class was held nine times over the course of the project period. A total of 26 different patients attended the educational sessions.

Discussion of Findings

The key finding in this quality improvement project was that there is a true need for education of the diabetic patient population in the rehabilitation facility. I educated staff members on the staff educational material that was presented to patients as an educational refresher and competency. By doing so I found that many non-nursing staff members also needed refresher education on diabetes management in order to successfully care for the diabetic population. For example, many of the licensed physical and occupational therapists, including aides and transporters, were unaware of many of

the signs and indications that diabetics displays when they are experience hyper- or hypoglycemia symptoms.

Many of these staff members actually admitted that oftentimes they even forget to report these symptoms to the nurse after the patients are transported back to their rooms after their therapy sessions are over. Lack of communication between providers could cause deterioration in patient care. When educating staff, I used many different visuals to show the signs and symptoms that these patients may display. Staff members admitted to seeing these symptoms before in some of their patients but never realized how serious they could become. Recognizing these symptoms is important for all staff members, including transport staff, who all play an important role in patient care. Healthcare professionals must be equipped with the most up-to-date EBP knowledge on diabetes care in order to successfully care for this patient population (Young, 2011).

Implications

All members of the rehabilitation team have the responsibility of being able to adequately manage and care for the diabetic population. Providing education to the hundreds of diabetic patients who enter the facility each year can be difficult task for staff (Maryniuk, Mensing, Imershein, Gregory, & Jackson, 2013). Team members must be able to recognize hypo- and hyperglycemic signs and symptoms of diabetic patients and understand how to properly treat them. Recognizing symptoms of the diabetic patient is especially important for the therapy staff in the facility because much of the patient's time is spent each day in the therapy gyms, unsupervised by nursing staff. Educational efforts to teach family members about the needs of the diabetic patient are also important

in this setting because so many of these patients have much other comorbidity. Many of these patients have suffered stroke or others disabling injuries that will leave them impaired and no longer able to care for themselves. Family members must step in and learn how to provide the proper medical care and disease management for patients with such conditions. With this program, family members will not only learn to care for their loved ones, but will also receive valuable knowledge on how to hopefully prevent themselves from acquiring this disease as it can run in family histories.

Limitations, Strengths and Recommendations

Limitations

The major limitation of this quality improvement project was the short timeframe in which I conducted it. The data collection was completed in a 2.5-week period. The quality improvement project was limited to a short time period because DNP projects are limited to the timeframe of courses. Time was also a factor in relation to facility needs because the project facility runs on a very strict schedule. Staff members took time out of their daily schedule to participate in their educational portion of the project.

Another limitation was that the general length of stay for patients in the rehabilitation facility usually spans from 10 to 14 days. Decreased blood glucose results were shown in some patients, although more time would be needed to test true trending results and success rates. There was a limitation of staff participation in the diabetes education program because a large percentage of the staff population is PRN staffs who do not work at the facility on a regular basis. The facility is also fairly small (a 50-bed

inpatient rehabilitation facility), which could have been a limitation in terms of patient population.

Strengths

The biggest strength of this project is that it can be used in almost any rehabilitation facility and that this particular facility has plans of adopting this quality improvement project to increase the success rates of its diabetic population. The project was cost free, although I recommend that the facility incorporate other teaching materials such as injection models for insulin administration in the future to increase patient learning. The use of demonstration and provision of supplies to all patients, especially newly diagnosed diabetics would be helpful teaching modalities (New, 2010).

Recommendations

A structured multidisciplinary approach to diabetes education should be put into place at all rehabilitation facilities in order to increase the success rates for the diabetic population and to decrease readmission rates of these patients. These educational classes will help to inform both patients and families of proper disease management and care. Providing group-class settings allows for social interaction of patients with the same disease type, which allows time for patient discussion and collaboration (New, 2010).

Although all diabetic patients need individualized care and medical management, implementing a standardized order set for diabetics will help to keep all health care providers on the same page when caring for this population. The treatment of the disease must be related to each individual patient's lifestyle and body type (Kosti, & Kanakari, 2012). Onboarding staff should be oriented to the diabetes education classes because a

large percentage of patients who enter the facility suffer from this disease. Staff members must learn how to recognize how to diagnose and treat the signs and symptoms of hyper- and hypoglycemia. Many of the staff members in this facility are therapists or transport staff. Patients in this facility spend numerous hours exercising, thus their blood glucose results tend to fluctuate. Patients living with this disease need ongoing support and training (Siminerio, DePasquale, Johnson, & Thearle, 2015). All providers in the facility must be competent in how to care for the diabetic population. I recommend annual competency training to fulfill this need.

Summary and Conclusions

This diabetes management quality improvement project showed that there is no particular standardized set of medical orders that can be set in place for every diabetic patient in the rehabilitation facility because every patient needs individualized medical care. My findings also showed that each physician and healthcare provider has their own individual preferences when it comes to medically treating the diabetic patient, although a generic order set can be placed into the electronic health maintenance system to cover diabetic patients' medical management on admission to the facility. Key findings included educational efforts for staff, patients, and families, which will be the most successful for managing and preparing the diabetic population for effective disease management after discharge. Key findings showed educational needs for both staff and patient populations. Educating staff members on the diabetic population will leave them better equipped to care for this target population in the facility. Because of this project,

patients and families of this population will be more prepared to care for themselves when discharged into the community.

Section 5: Scholarly Product for Dissemination

Introduction

The purposes for dissemination of this project are to share results with key stakeholders at the facility and to spread the word of project success to similar rehabilitation facilities so that they could adopt similar quality improvement projects. I created a PowerPoint presentation to display project results to staff members and stakeholders at the facility. The PowerPoint presentation remains at the facility as part of an ongoing quality improvement project.

Stakeholders

I will present the project results to key stakeholders of the facility using the PowerPoint presentation. Key stakeholders include members of the administrative and leadership teams. Stakeholders must view all pertinent project information such as that regarding quality improvement, cost containment, and accountability (Markhorst, Martirosyan, Calsbeek, & Braspenning, 2012). This is a small facility so every member of the team will be involved and have an opportunity to review displayed results. From this point forward, clinical team members will be on the role of leading the educational classes for patients and families, while the hospital educator will take on the responsibility of maintaining staff educational competency.

Analysis of Self

The DNP project was more much more than I ever thought it would be. I often encountered many bumps in the road, but was able to overcome them one step at a time. In the beginning I felt that this program would simply be a series of tasks that I would

complete, but it was much more than that. The DNP program focuses on development of advanced skills and competencies that are needed to translate existing evidence into practice, with a strong focus on leadership, policy, and quality improvement (Houghton, Casal, Fortuna, & Larsen, 2015).

As a scholar, I learned so much from those around me at my practicum facility, and so much about myself. While at the practicum facility, I had the privilege of having three different preceptors who held various senior-level positions. I was able to have different experiences with each of these preceptors, while learning something new about myself from each experience. Before this experience, I was not familiar with the rehabilitation setting. Through this project, I have been exposed to whole new world.

I originally returned to school to achieve my DNP because I have a passion for education. The DNP-prepared nurse assumes responsibility and accountability for their practice (Shelton, 2016). I have held various roles in academic institutions thus far, including clinical positions at various institutions. The DNP experience gave me the opportunity to expand on my passion. As an educator, I am responsible for passing down accurate knowledge to my students. I have been able to work with key stakeholders in the facility to address such an important issue. I found myself becoming more aware of how to critically analyze the literature to properly educate those around me in order to promote social change. DNP-prepared nurses have the responsibility of becoming transformational leaders (Shelton, 2016).

The DNP journey was a most enjoyable experience because the staff at this facility cared about my learning and what I would take from my experience. They were

willing to meet my needs or accommodations for my project. Patients, families, and even staff were always so gracious to receive education. The DNP journey was a very moving and fulfilling experience for me.

Similar Facilities

The practicum facility is part of a corporation that has a chain of various rehabilitation facilities across the United States. Many are a lot larger than the facility where I conducted this project. This quality improvement project could be implemented at various other facilities throughout the corporation to improve diabetic patient outcomes. Healthcare facilities are encouraged to share their quality improvement success stories with other facilities because they could be adopted and implemented elsewhere for patient success (Schneider, 2017). My quality improvement project could be implemented in any rehabilitation setting. As far as educational aspects, this project could even be used in the acute care arena because patients' length of stay there may be similar to that in rehabilitation facilities.

The results and findings could be published in diabetes journals. Many scholars now receive the invitation to publish their work, as do DNP students (Houghton, 2017). The American Diabetes Association publishes peer-reviewed journals. The results from this quality improvement project would be a great resource for patients and families, and a great educational resource for clinical and healthcare staff.

Summary

The results and findings of this DNP project show that enhanced diabetes education leads to increased overall success rates of patients in the rehabilitation setting.

Educational tools are also a great resource for families and caregivers of the diabetic patient after a patient is discharged from the facility. I disseminated results to stakeholders at the project facility by means of visual display using a PowerPoint presentation. Through this process, I was able to reflect upon my DNP journey and analyze myself as a scholarly practitioner. I have grown in so many ways and learned so much from this experience. Similar facilities could benefit from the same type of quality improvement project by incorporating educational efforts for their diabetic populations.

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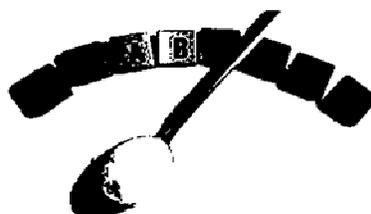
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Appendix A: Education and Dissemination of Results PowerPoint

DIABETES EDUCATION

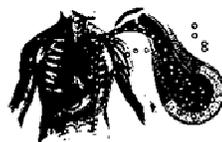
OVERVIEW

- Diabetes- What is it?
- Complications/Risks
- Prevention- A new way of living
- Signs and Symptoms
- Adverse Events



DIABETES

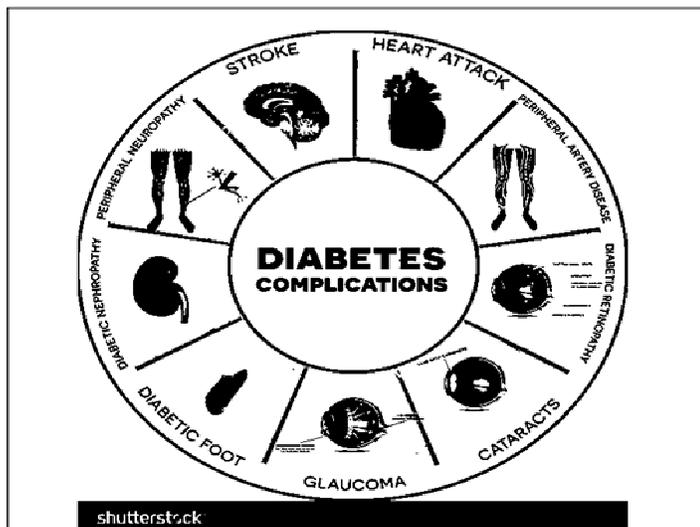
- What is insulin???
- An important hormone that brings your blood sugar (glucose), into your body's cells.
- Essentially your energy transport.



TYPES OF DIABETES

- Type One
 - The body does not naturally produce insulin
 - Known as "insulin dependent"
 - Needs insulin replacement therapy
- Type Two
 - The body is resistant to insulin
 - Known as "insulin resistant"
 - Most common type
 - Needs lifestyle modification





PROPER FOOT CARE



- Foot ulcers-combination of nerve damage/damage blood supply.
- Inspect feet twice daily and always after any physical activity.
- Use gently cleansing products and apply moisturizers.
- AVOID: heating pads, hot packs, and harsh topical agents.
- Trim toenails, wear comfortable socks and shoes.
- Use a mirror to inspect the bottom of the feet and heels.

PROPER NUTRITION

- Reach/maintain a healthy weight and blood sugar.
- Be consistent with snack times and the types of food you consume.
- Eat at the same times each day.
- Careful carb counting.



REGULAR EXERCISE!

- A minimum of 30 minutes of regular physical activity each day.
- Daily physical activity has “insulin-like” effects on the body and can help to decrease blood sugar levels/maintain at a healthy level.
- Regular physical activity helps to maintain a healthy weight.



HYPERGLYCEMIA SIGNS & SYMPTOMS

- Increased thirst/dry mouth
- Increased urination
- Blurry vision
- Drowsiness/fatigue

HYPERGLYCEMIA
(High Blood Sugar)

CAUSES: Eat much food, too little insulin, illness or stress.

RISK: Obese, May progress to diabetic coma.

BLOOD SUGAR: Above 200 mg/dL.
Acute/chronic risk: 1-9-209 report.

SYMPTOMS

 FREQUENT URINATION	 DRY MOUTH	 EXTREME THIRST
 BLURRED VISION	 DROWSINESS	 NAUSEA

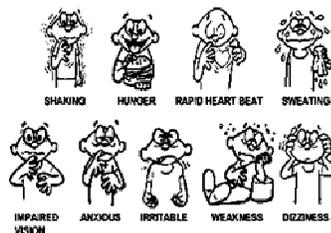
WHAT CAN YOU DO?

 TEST BLOOD SUGAR

 IF YOU ARE HAVING TO TEST AND CALL YOUR DOCTOR

HYPOGLYCEMIA SIGNS & SYMPTOMS

- Excessive sweating
- Hunger
- Lightheadedness
- Fatigue
- Blurred vision
- Pale skin/shakiness
- Headache



DIABETES MANAGEMENT

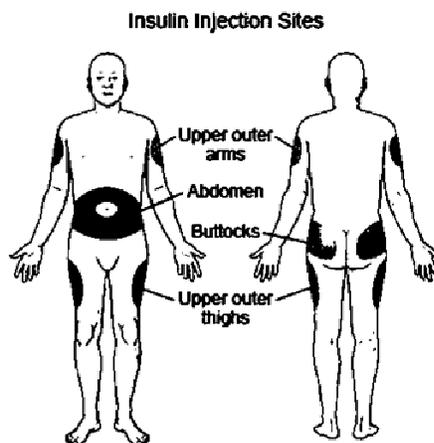
- The first step in management of type 2 diabetes is meal planning, weight loss, and exercise.
- Oral glycaemic agents may be introduced.
- If oral agents cannot control the diabetes conditions an insulin regimen may need to be introduced.



WHERE DO I GIVE MY INSULIN??

Insulin is administered in the subcutaneous tissue, which is the "fatty" tissue of our bodies.

Insulin should be administered at a 90 degree angle, unless the patient has very little subQ tissue, then a 45 degree angle may be necessary.



ADMINISTERING INJECTIONS

TABLE: PRACTICAL TIPS FROM THE AADE FOR MINIMIZING PAIN DURING INJECTION*

- **Wait until insulin reaches room temperature before injecting.**
- **Inspect area to be injected, swab with alcohol wipe, and wait for area to dry.**
- **Use a new needle with each injection.**
- **Insert the needle quickly.**
- **To reduce leakage, keep the needle in the injection site for 10 seconds with pen needles and for 5 seconds with syringes.**
- **Avoid shifting needle while in injection site; carefully draw needle out through the same path.**

AADE = American Association of Diabetes Educators.

Sites are rotated frequently to prevent poor absorption and tissue injury.

TYPES OF INSULIN

- **Rapid-acting insulin**— begins to work about 15 minutes after injection, peaks in about 1 hour, and continues to work for 2 to 4 hours. Types: insulin glulisine (Apidra), insulin lispro (Humalog), and insulin aspart (NovoLog)
- **Regular or Short-acting**— Insulin usually reaches the bloodstream within 30 minutes after injection, peaks anywhere from 2 to 3 hours after injection, and is effective for approximately 3 to 6 hours. Types: Humulin R, Novolin R
- Insulin generally reaches the bloodstream about 2 to 4 hours after injection, peaks 4 to 12 hours later, and is effective for about 12 to 18 hours. Types: NPH (Humulin N, Novolin N)
- **Long-acting insulin**— reaches the bloodstream several hours after injection and tends to lower glucose levels fairly evenly over a 24-hour period. Types: insulin detemir (Levemir) and insulin glargine (Lantus)
- - See more at: <http://www.diabetes.org/living-with-diabetes/treatment-and-care/medication/insulin/insulin-basics.html#sthash.7BrN38eC.dpuf>

CHARACTERISTICS OF INSULIN

- **Onset** is the length of time before insulin reaches the bloodstream and begins lowering blood glucose.
- **Peak-time** is the time during which insulin is at maximum strength in terms of lowering blood glucose.
- **Duration** is how long insulin continues to lower blood glucose.



DISSEMINATION OF RESULTS

- The data collection was completed within a two and a half week period ranging from 8/22/17 to 9/7/17. 100% of diabetic patients and families participated in educational efforts during this time frame. A total of 26 patients attended sessions.
- 216 staff members had the opportunity to participate in the educational efforts, 80 took the opportunity (37% total).
- The Logic Model was used as a framework for program design, as this model was used as a visual representation to display all aspects of the program to include: goals, budgeting, financial resources, etc.

SOURCES OF EVIDENCE

- Gathered by staff interview data.
- Thematic analysis of interview was performed to verify trends in respondent answers.
- De-identified patient information from ACE-IT medical record system.
- Program evaluated through use of the Logic Model and follow up staff interviews.