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Diabetes Self-Management Education: A Rural Health Development

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DIABETES SELF-MANAGEMENT EDUCATION: A RURAL HEALTH DEVELOPMENT

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An Abstract of the Scholarly Project by
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The purpose of this Scholarly Project was to explore the need for a Diabetes Self-Management Education (DSME) Program in a rural health community in Southeast, Kansas (SEK). Statistics in Crawford County reveal that 10% of the population has been diagnosed with Type 2 Diabetes Mellitus (T2DM) and a rising number of patients that are classified as obese. Without serious interventions many of these patients will develop T2DM. DSME programs provide essential skills and resources for patients to maintain glycemic control and reduce risks associated with this life-long disease. This study utilized data from fifty T2DM patients in the SEK area. Four crucial determinants of the individual T2DM patient's health were explored: blood pressure, body mass index (BMI), low density lipoprotein (LDL) cholesterol, and hemoglobin A1C. The significance of this data was to determine the glycemic control and overall health of the T2DM population in the demographic area. Data was collected and the mean was analyzed for each determinant of health. Data concluded the sample was at a desired level for blood pressure and above the desired level for BMI, LDL cholesterol, and hemoglobin A1C. The results of this study validated the need for a DSME program that could be utilized by the SEK community. A DSME program in the southeast Kansas area would provide patients with the necessary resources to self-manage their lifelong disease.

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Introduction

Type 2 Diabetes Mellitus (T2DM) is a growing epidemic worldwide. With the prevalence of diabetic related complications rising, it is essential for diabetic patients to be competent in the management of their long-term illness. There are many constraints to diabetic education in the primary care setting, such as time and extensive diabetes management education. It would be beneficial for T2DM patients to have access to a Diabetes Self-Management Education (DSME) program or individualized Diabetes Education, in which they would have support by an experienced educator. The addition of self-management education into the healthcare plan provides the diabetic population with a personalized plan for their disease process. "DSME incorporates standard curricular elements such as: disease process and treatment options, nutritional management, physical activity, medication use, blood glucose monitoring, prevention and detection of acute and chronic complications, and strategies to address psychosocial issues and to promote healthy behaviors" (Hoppin, Ponder, Schreiner & Wolfsdorf, 2015).

Clinical Issue

The population of patients with Type 2 Diabetes Mellitus in a Southeast Kansas community is lacking in resources available for diabetes education. There is currently no DSME program available in the rural health community. DSME has proved to be a valuable adjunct to the primary care of type 2 diabetes patients. It enables the population with pre-diabetes and type 2 diabetes to learn about long-term disease management and encourages participation in preventing complications. The lack of a DSME program is a critical issue in the SEK area, and a need exists to establish one in order to better serve an under supported part of the population.

Significance to Nursing

The diabetes epidemic is expected to increase globally, affecting an estimated 366 million people by 2030 (World Health Organization, 2015). Diabetes is a long-term illness, which brings disease-related complications if not maintained at the earliest state. There is an opportunity for healthcare providers to fill the void of knowledge in the self-management of diabetes and empower diabetic patients to control their health.

According to the Robert Wood Johnson Foundation (2016), 10% of adults over the age of 20 have a diagnosis of T2DM and 35% of adults residing in Crawford County Kansas are obese. Without serious lifestyle modifications, a vast majority of these patients have an increased likelihood of developing T2DM in the subsequent years. In rural areas of Crawford and Cherokee County, there are few resources available to patients for disease related education, such as diabetes educators or DSME programs. A search was conducted through the American Association of Diabetes Educators and revealed two diabetes educators in

Crawford County and eight accredited DSME programs available throughout the state (AADE, 2015). Due to the poverty level of the area and deficiencies in transportation, patients do not have access to educators that require a longer travel distance. There is one DSME program in Southeast Kansas, approximately 20 miles from the rural hospital in discussion.

Project Questions

There are many aspects included in DSME education that heavily focus on the self-care behaviors of the T2DM patient. Healthy eating, exercising, medication adherence, and reducing risks are concepts that provide patient involvement and control in their disease process (Gupta & Kalra, 2015). Diabetes is a major cause of morbidity and mortality and affects an estimated 27 million individuals in the Unites States (Barton, et.al. 2014). This chronic disease process requires knowledge of how to manage progression and prevent premature death through preventing disease related complications.

The National Guideline Clearinghouse (2012) state that education is a crucial component in management of Type 2 Diabetes Mellitus. For the purposes of this scholarly project, the author examined two main project questions:

1. What is the current health status of the T2DM population in four determinants of health?
2. Is there a need for a DSME program in the Southeast Kansas rural health community?

Throughout the literature review the following questions were examined to support the

DSME program:

1. Is there an established framework or national standards for diabetes self-management education and training?
2. What is the process for implementing diabetes self-management education?
3. Who should deliver diabetes self-management education to the T2DM population and what are the major responsibilities of this person?
4. What critical aspects must be included in diabetes self-management education?

Purpose

The purpose of this scholarly project is to analyze patient data to determine the overall disease management of the T2DM population. Through data analysis, support for a DSME program in a southeast Kansas rural health clinic can be justified and would provide the SEK population with educational opportunities to manage their chronic illness. The American Association of Diabetes Educators (2015) identifies behavior changes as being the most important aspect of disease management. Maintaining a lifestyle that focuses on healthy eating, exercise, medication compliance, and reducing risks has proven to be beneficial to this population (Hoppin et.al, 2015). Through the educational experience, patients would be provided with an empowering drive for diabetic control and increased knowledge of disease maintenance.

If the literature supports the use of DSME programs as being a positive attribute in patient care, then it is essential for healthcare providers to utilize diabetes educators or educational programs to advance the knowledge of the diabetic population. The literature

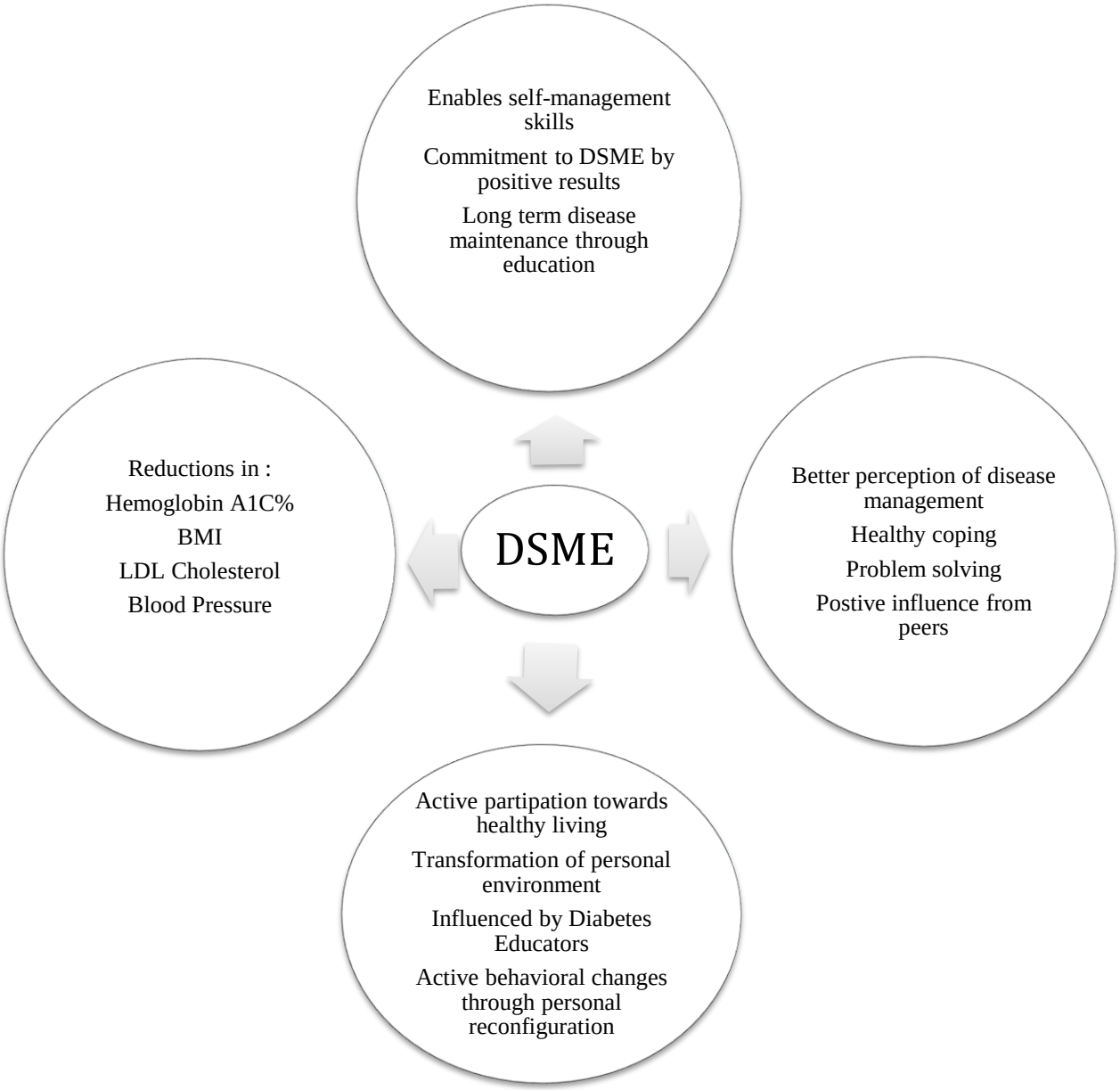
has shown that regular monitoring of blood glucose lowers the severity of diabetes and reduces the incidence for disease related complications (Hoppin et.al, 2015).

Theoretical Framework: Nola Pender's Health Promotion Model

In 1982 nursing theorist Nola Pender developed a health promotion model that will be utilized in making a connection between DSME and the T2DM patient. In this model, Pender discusses the individual's characteristics, experiences, and behaviors as leading to a particular outcome. Pender believed that "behaviors should result in improved health, enhanced functional ability and better quality of life at all stages of development" (Nursing Theorists, 2015.

The following diagram (Figure 1) depicts the author's interpretation of DSME as an interventional method. Post-DSME, the individual has made improvements physicially as evident in reductions in BMI, blood pressure, LDL cholesterol, and hemoglobin A1C. Cognitively, the patient is better prepared to independently manage their disease, evident by emotionally accepting the diagnosis, participating in health promoting and preventative healthcare, and commitment to life-long self-management strategies.

Figure 1: Relationship of DSME to the Individual



Definition of Key Terms

Throughout this paper, the reader will come across specific terms that will need to be clearly defined to enable understanding. These terms include the following:

Blood glucose level: The amount of glucose in the blood at a given point in time; also known as blood sugar level, serum glucose level, and plasma glucose concentration (CDC, 2015).

Blood pressure: The pressure of the blood against the inner walls of the blood vessels, varying in different parts of the body during different phases of contraction of the heart (CDC, 2015).

Body Mass Index (BMI): The measurement of body fat with body weight (Up to Date, 2016).
The research will discuss different classifications for BMI as followed:
Underweight – BMI <18.5 kg/m^2.
Normal weight – BMI ≥18.5 to 24.9 kg/m^2.
Overweight – BMI ≥25.0 to 29.9 kg/m^2.
Obesity – BMI ≥30 kg/m^2.
Obesity class I – BMI of 30.0 to 34.9 kg/m^2.
Obesity class II – BMI of 35.0 to 39.9 kg/m^2.
Obesity class III – BMI ≥40 kg/m^2.

Cholesterol: Cholesterol is a waxy substance that comes from the body and food. The human body, and especially your liver, makes all the cholesterol you need and circulates it through the blood. Dietary sources of cholesterol are from animal sources, such as meat, poultry and full-fat dairy products, when the body eats a diet high in saturated and trans fats, the liver produces more cholesterol (American Heart Association, 2015).

Comorbidity: A concomitant but unrelated pathologic or disease process; usually used in epidemiology to indicate the coexistence of two or more disease processes (The Free

Dictionary, n.d).

Diabetes Educator: A health professional, such as a registered nurse, registered dietician, pharmacist, physician, physician's assistant, clinical psychologist, exercise psychologist, occupational therapist, physical therapist, optometrist, podiatrist, or social worker, who specializes in providing care and education to people with diabetes (CDC, 2015).

Diabetes Self-Management Education (DSME): "The ongoing process of facilitating the knowledge, skill, and ability necessary for pre-diabetes and diabetes self-care" (Gupta & Kalra, 2015).

Hemoglobin A1C: a blood test used to measure one's blood sugar over a 3-month time period. Desired lab values according to the American Heart Association are < 7.0% for the T2DM patient (American Heart Association, 2015).

Hyperlipidemia: Abnormally elevated levels of lipids in the blood. Depending on co-morbidities, the desired levels of LDL cholesterol is <100 mg/dL (CDC, 2015).

Hypertension: Elevated blood pressure. A diagnosis of hypertension is typically made when readings are consistently greater than 140/90 (CDC, 2015).

Low-density lipoprotein "LDL" cholesterol: makes up the majority of the body's cholesterol. LDL is known as "bad" cholesterol because having high levels can lead to plaque buildup in your arteries and result in heart disease and stroke (CDC, 2015). The American Diabetes Association recommends that people with diabetes keep LDL levels at or below 100 mg/dL, or under 70 mg/dL if they also have cardiovascular disease (ADA, 2016).

Primary care provider: A primary care provider (PCP) is a health care practitioner who sees people that have common medical problems. This person is a doctor, physician assistant, or a nurse practitioner.

Total cholesterol is a measure of the total amount of cholesterol in your blood and is based on the HDL, LDL, and triglycerides numbers (CDC, 2015).

Type 2 Diabetes Mellitus: Type 2 Diabetes Mellitus is a chronic disease that is characterized by high blood glucose, insulin resistance, and impairment in insulin secretion; over time it can yield complications in the vascular system, eyes and kidneys. A diagnosis of T2DM is made when the hemoglobin A1C measures >7% (CDC, 2015).

Logic Model

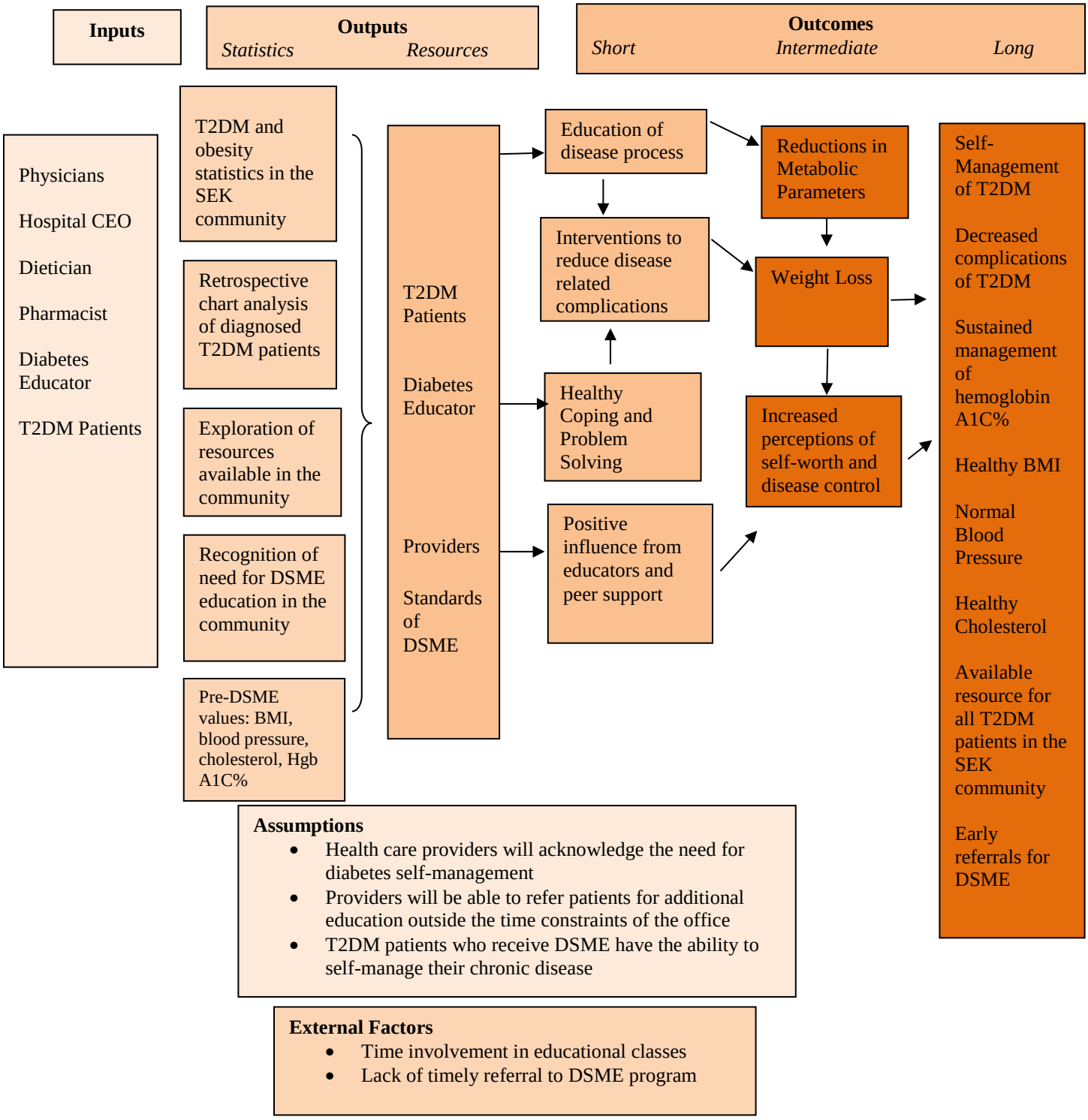
The following diagram (Figure 2) is a logic model that depicts the process of development and expected outcomes of a DSME program. The beginning stages of development would require input from key stakeholders such as local physicians, pharmacists, and T2DM patients in the rural community. Testimony from experienced diabetes educators contributes to knowledge of disease process, interventions to reduce T2DM complications, as well as education and support. The input from these stakeholders provides valuable insight in the process of program development.

To establish the need for a DSME program, a retrospective chart review to extract data from the T2DM patients' information, provides insight into the current health status of the sample population. The logic model displays statistics and resources utilized for program development. The exploration of current statistics in the southeast Kansas (SEK) rural community on the number of individuals already diagnosed with T2DM and rates of obesity provide rationale for program development.

In this diagram, the short, intermediate, and long-term outcomes post-DSME are represented. The short-term outcomes, predict the most immediate response for the T2DM patient. Through education, the population will have enhanced knowledge of diabetes, which provides patients with the ability to problem solve and cope with having a life-long disease. Intermediate outcomes of regular DSME are weight loss and reductions in metabolic parameters, while maintaining a positive self-imagine and outlook on disease control. The long-term expectations of regular participation in DSME

is overall maintenance of hemoglobin A1C, BMI, blood pressure, and cholesterol, while reducing associated complications and co-morbidities.

Figure 2: Logic Model: Development of a Diabetes Self-Management Education Program



(Adaptation from University of Kansas, Community Tool Box)

Summary

With the epidemic of T2DM spreading globally, efforts should be made to educate patients on self-management strategies to improve their health outcomes. According to the American Diabetes Association (2015), approximately 30 million children and adults have diabetes in the United States and out of that number, nearly 95% have type 2 diabetes. These drastic numbers have an impact on public health implications for a multitude of reasons. For example, the cost of diagnosed diabetes in 2012 was $245 billion dollars through medical expenses and time missed from work (CDC, 2016). Expenses related to diabetes have raised over $100 billion dollars in the last five years and are expected to increase, as the prevalence of T2DM increases. Costs of disease related hospitalizations and complications could be reduced with better glycemic control.

Diabetes is a long-term illness in which ongoing education and support are essential components to reduce the risk of disease related complications. It can cause major health complications that affect many of the body's most vital organs. Complications such as heart disease, kidney failure, damage to the eyes and nerves, and a higher incidence of lower-extremity amputations are more prevalent in this population. Through literature review, we can conclude there to be a relationship between involvement in a DSME programs and the reduction in hemoglobin A1C, body weight, and better understanding of disease management. DSME provides T2DM individuals with support in decision-making, self-care behaviors, problem-solving and active collaboration with the health care team and to improve clinical outcomes, health status, and quality of life (Marie & Kegels, 2014). With this knowledge, healthcare providers

should seek out the means to provide their patients with proper individualized education for the maintenance of their chronic disease.

Chapter II

Review of Literature

The development of an educational program involves time and utilization of many resources. A thorough review of literature should be conducted to support the link between involvement in a Diabetes Self-Management Education program and improved glycemic control in patients with type 2 diabetes. The purpose of this research was to analyze patient data to determine the overall disease management of a sample of T2DM patients. This information provided evidence to support the development of a DSME program in a rural health clinic in southeast Kansas.

If the literature recognizes that participation in a DSME program is a beneficial resource in disease management, the development of an accredited program in a rural health area would be warranted. Throughout this chapter, there will be a discussion of how the literature portrays participation in a DSME program with improvements in the T2DM population. There is discussion of clinical practice guidelines, crictical components in self-management education, and evidence-based literature that links DSME involvement to improvements in the T2DM population.

Evidence-Based Practice

The resources utilized for evidence-based practice information were collected from academic journals that are composed of peer- reviewed articles. Scholarly journals, clinical practice guidelines, and information from nationally accredited diabetes education websites were explored in the literature review. Online databases were utilized to search for terms, relevant to the scholarly project. To gather articles for literature review, "Diabetes self-management education (DSME)" and Type 2 Diabetes Mellitus (T2DM), were two key terms used. From this search, multiple terms and phrases were utilized in the search:

- National Standards of Diabetes Self-Management Education
- Diabetes Educators
- AADE-7 Self-Care Behaviors
- Sustainability of DSME
- Hemoglobin A1C

DSME and Glycemic Control

When investigating the role of DSME programs, one article provided insight into the diabetic patients' individualized self-management practices and their motivation for DSME adherence. In this study, 37 individuals participated in either a focus group, an interview, or completed an open-ended questionnaire. The purpose of the study was to gather motives for self-managing T2DM. The study concluded a self-maintenance routine as the foundation of success. The study discusses the role of diabetes self-management education and practices as the groundwork for disease management (Asimakopoulou,

Newton, & Scambler, 2015). Literature suggests that when a routine pattern of health practices is followed, patients have a better grasp of long-term disease control.

To compare T2DM patients who have received DSME as an educational intervention versus men who do not participate in DSME, Anderson, Vaccaro, and Huffman (2015) analyzed two groups on glycemic control. The study discusses 647 men diagnosed with T2DM. In a group of patients that had a hemoglobin A1C >7.5% receiving education, there was a substantial improvement in glycemic control when compared to the group receiving only standard care (Anderson et.al, 2015). From this study, the authors strongly support DSME efforts.

In a study by Allen, Garb, Welch, & Zargarins (2012), participants received diabetic self-management education over a six-month intervention period. Patients underwent individualized counseling that focused on motivation strategies to influence health behaviors. Baseline data was collected on hemoglobin A1C levels, and behavioral factors were also taken into consideration (i.e., diabetes distress, depressive symptoms, diabetes self-care behaviors, treatment satisfaction) using questionnaires. Results of the study concluded that, "mean change in hemoglobin A1C from baseline to 6-month follow-up was -0.58 ± 1.33% (P \ 0.01) indicating a statistically and clinically significant improvement in blood glucose control during the intervention period" (Allen, Garb, Welch, & Zargarins, 2012). With A1C reduction, diabetes related self-care behaviors and treatment satisfaction were also improved. The literature review aids this researcher in supporting the causual relationship between diabetes self-management education and improvements in glycemic control.

Sustainability

Education in disease management has been described as a critical component in preventing the progression of T2DM complications. While trying to get the T2DM patient's blood sugar under control at the earliest stages is beneficial for symptom management, the life-long management of a chronic disease such as T2DM is just as critical. The following section is a discussion about the role of DSME and sustained metabolic parameters.

In one study, there was a discussion of how DSME programs sustain hemoglobin A1C levels, after the initial education had taken place. In this particular article, patients had completed a DSME program in 2009 and received follow-up on their A1C% measurements for two years after. The outcomes of this study were measured at one-year post DSME education, and then again at two years. The results concluded that of those 43 patients, there was a significant reduction of hemoglobin A1C, which was sustained for the entire 2 years' post-education. What one could gather from this study is that patients' benefit from self-management techniques and skills, to which they can monitor themselves without continuous education (Campbell et al., 2014).

T2DM is a slow-developing disease that often goes undiagnosed for years, during this time blood sugar levels can rise dangerously high. The short-term effects of DSME, even after six months of education, yielded improvements in five critical components of diabetes management: blood pressure treatment with an ACE inhibitor, recent dilated eye exam, recent measure of kidney function, improvements in cholesterol, and a decrease in the patient's hemoglobin A1C (Barton, et.al, 2014).

Evidence

Evidence suggests that DSME programs are linked to improved glyemic control, therefore decreasing complications that are directly related to living with type 2 diabetes. To establish a program that will be structured to provide the diabetic population with evidence-based education and skills to self-manage, a set of national standards for DSME programs have been developed and nationally implemented.

The American Association of Diabetes Educators is proactive in the neccessity of self-management practices. To fully understand the context of the disease process, learning is crucial. The ADA discusses that, "defining personal goals, weighing the benefits and risks of various treatment options, making informed choices about treatment, developing skills (both physical and behavioral) to support those choices, and evaluating the efficacy of the plan toward reaching self- defined goals" are crucial steps in diabetes education (AADE, 2015).

The National Guideline Clearinghouse has established education in the self-management of type 2 diabetes and being an integral part of long-term disease control. The role of the educator is invaluable, evident in their participation in the assessment, goal-setting, planning, implementation, evaluation, and follow-up of education provided to patients with T2DM (National Guideline Clearinghouse, 2015). Guidelines support a strong recommendation that all T2DM patients should have access to a self-management education program or training by a competent educator and should reflect the seven categories developed my the American Association of Diabetes Educators (AADE).

AADE7 Self-Care Behaviors

The American Association of Diabetes Educators has established seven areas of diabetes self-management referred to as the AADE7 (2015). The first component of self-management behaviors is healthy eating. Because of the chronic nature of diabetes and skills for long term discipline, it would be beneficial for the population to have knowledge in healthy eating decisions. The AADE stresses the importance of a balanced diet that is attentitve to complex carbohydrates, fruits, vegetables, and lean proteins. There are many opportunies for educators to discuss concepts such as meal planning, portion control, and carbohydrate counting. Early learning and adapatation of these practices will enable patients to incorporate learned behaviors into their daily routines. The AADE recognizes that physicial activity should be a part of a patient with T2DM daily routine. Physical activitity provides a means for weight loss, stress reduction, blood sugar stabilization, and improvements in cholesterol. Starting out slowly and adapting to small time periods of exercise, will yield greater results in exercise adherence.

The third concept in self-mangement education is a broad term of self-monitoring. While not every type 2 diabetic patient has been educated to monitor their blood sugar at identical intervals, the AADE encourages glucose monitoring as an important compent to disease progession and an integral evaluation of diabetic control. One of the more crucial elements of T2DM self-monitoring is the responsibility of the patient to check their blood sugar. While this repetive task seems to be a mundane part of diabetes, it allows the patient to self-monitor how they are doing with medications, diet, and if further adjustments are needed by the primary care provider. Along with blood sugar, the AADE

encourages regular monitoring of blood pressure, BMI, cholesterol, kidney and eye function, and encourgages regular foot exams. All of those aspects are essential in the "self-monitoring" portion of diabetes.

Medication adherance is an essential component to disease management and prevention of progession. Not only does the AADE stress the necessity to take diabetic medications as prescribed, but with diabetes often comes other co-morbid conditions such as hypertension and hyperlipidemia. The importance of taking blood pressure medications, especially ones with kidney protection such as ACE inhibitors, medications to lower cholesterol levels, and aspirin to reduce risks of a heart attack, are all measures to be included.

Problem solving is a part of the AADE7 that is based upon personal experience and living with diabetes. The AADE acknowleges that even with strategic planning to maintain adequate blood sugar levels, things may need to be adjusted such as snacks or insulin, and DSME can often prepare patients to assess the situation and come to a conclussion independently. From these experiences, the T2DM patient will learn from these behaviors and solutions and future problems may be addressed easier.

Reducing risks is a concept discussed in DSME and is used as a broad description of steps taken to reduce complications directly related to diabetes. The AADE lists smoking cessasion, regular visits to the doctor and dentist, foot and eye exams, and regular monitoring of blood pressure and cholesterol as critical elements of self-management. These are the basic elements of self-management that the patients are solely responsible.

Healthy Coping is the final element of the AADE7 self-care behaviors. It is evident that living with type 2 diabetes can be stressful to both the body and mind. The AADE aids and encourages patients in ways to relieve stress that will be beneficial to one's mood and glycemic control. Among the behaviors that have been discussed in the literarature, exercise, social support, spiritual guidance, and involvement in hobbies and groups are among the many that can help individuals cope with stress and living with a chronic disease.

National Standards

To ensure that a DSME program meets the needs of the diabetic population and adequately addresses the necessary components of self-management education, a set of national standards for program development have been created. The national standards for DSME are designed to provide quality education that can be implemented in various settings to enhance the outcomes in T2DM patients. The first standard discusses the importance of the program's organizational structure, mission statement, and goals (Brown, et.al, 2012). While these three concepts are in the beginning stages of program development, they ensure a secure plan for DSME success and yield an organized format to provide quality education. The second standard recommends the development of an advisory board composed of area healthcare professionals, members of the population with diabetes, and other stakeholders to provide an active voice in program development and continuous improvement. The third standard examines the needs of the population and identifies resources necessary to meet those needs. In Chapter 3, this author will develop

the education program for the specific rural health community, and it would be essential to first look at the available resources in the community.

Standard four discusses the need for a project coordinator, which will oversee the development and implementation of the program. This person will have extensive knowledge in diabetes management and chronic disease processes. The fifth standard discusses the need for other instructors to provide education to the population with diabetes. The certified diabetes educator will maintain continuing education and provide the population with self-management skills. Standard six discusses the importance of a curriculum that reflects the most current practice guidelines with a plan to evaluate outcomes. This standard is essential to the patient's educational experience and provides the population with knowledge on disease progression and addresses each of the AADE7 self-care behaviors individually.

Standards seven and eight are directly related to the individual patient. The first stresses the importance of individual assessment of the patient disease status and individualized plan of care. The eighth standard, establishes a personalized follow-up plan for ongoing self-management support. The ninth standard is developed as a means to measure the patient's progress and to evaluate the effectiveness of the program's education. The final standard is a measure of the entire educational process and determines opportunities for improvement. The National Standards guide the development process and provide a means for program success (Brown et. al., 2012).

Providers

Diabetes self-management education has been described as a multidisciplinary approach to disease management. Not only does it involve the patient, diabetes educator, and primary care provider, it also relies on the expertise of pharmacists, nutritionists, and peer support. Over the course of several decades, DSME has evolved from didactic presentations towards an approach that centers on patient empowerment. The role of the diabetes educator is not meant to lecture patients or utilize scare tactics to promote compliance, but rather to be a central means of disease related support and promoter of self-management. Certified diabetes educators are the usual means of structured DSME education. As discussed previously, primary care providers are limited on education that is provided within the clinical setting, additional means for educational opportunities would be valuable to the patient and continuity of care.

Barriers

Diabetes self-management education can greatly influence the self-care behaviors of the T2DM population, yet only "one-third to one-half of diabetic patients in the United States receives DSME" (Brown et. al, 2012). With the literature supporting the evidence of these programs, providers should have a means to provide T2DM patients with education and individualized disease management. Literature has suggested that patients residing in rural health areas have a disadvantage due to lack of resources available to launch a DSME program, which this author cites as being the number one barrier to education in their rural health area.

Barriers to the utilization of DSME include a multitude of concepts, such as demographic characteristics, lack of insurance, low priority of education, difficulty attending educational sessions, and lack of support system (Brown et al., 2012). Brown et al. (2012), discuss the concept that primary care providers are the biggest source of information on DSME programs but a large number are not communicating to their patients this resource. This study addresses that lack of knowledge of the primary care provider in the role of education, is an unfortunate barrier to why there is no referral being made. In this situation efforts could be made to educate the primary care provider on how DSME can positively influence the patient and can provide valuable education as an adjunct to the clinical care they receive.

Summary

Over the course of this chapter, there has been a review of literature that provides the researcher with evidence of the contribution of education into the wellbeing of the T2DM population. The literature review has given insight into necessary components of DSME programs, evidence to support the sustainability of metabolic parameters, and case studies to suggest the overall improvements in patient's self-perceptions of disease. With this information, means for DSME development can be further initiated. In the following chapter, this author will discuss the process of data collection from the T2DM population with the intent to evolve a DSME program for a rural health community in Southeast Kansas.

Chapter III

Methodology

The project design and target population were chosen after completing a thorough review of the literature on DSME and the effects on patients with T2DM. The target population was chosen and analyzed to justify the need for self-management education and for the development of a DSME program in a rural Southeast Kansas community. T2DM is a chronic disease that requires long-term management. The focus of the research is to determine how well the diabetic population in a rural clinic in Southeast Kansas maintains glycemic control and reduces risks for disease related complications. Diabetic control is evident in a hemoglobin A1C level of 7.0% or less, blood pressure levels less than 140/90mmHg, LDL cholesterol less than 100 mg/dL, and BMI less than or equal to 25% (ADA,2015). Disease management is improved with medication adherence, dietary modifications, and exercise compliance, but for the purpose of this research will not be included. Through data analysis, whether or not this population could benefit from a DSME program to better serve in the management of their chronic illness can be determined. In this chapter, there will be a discussion of the population to be studied, the process for obtaining IRB approval to collect patient data, means for

protecting the privacy of the patients being studied, and a plan for program implementation and sustainability.

Project Design

The design of data collection was a retrospective chart analysis of T2DM patients, collected from a rural family practice clinic in Southeast Kansas. This method of data collection was chosen to yield the researcher with information that pertains to the overall control of the target T2DM population. The design utilized for this study was a descriptive cohort design to analyze the sample population's disease management by analyzing lab values of hemoglobin A1C, LDL cholesterol, BMI, and blood pressure measurements within the previous year. The clinic that data will be collected from does not currently utilize DSME; therefore, the population in discussion will have only received standard clinic care without the interventions of DSME. Chronic diseases, such as T2DM require lifelong management, but for the purposes of the research, this author did not feel medication adherence, dietary modifications and exercise compliance could be included in the study because they cannot be easily measured and yield valid results.

Sample

In examination of how well the population with T2DM has control of their chronic disease, a sample of 50 patients' health information was evaluated through a retrospective chart analysis. Once approval was granted through Girard Medical Center and Pittsburg State University, patient data collection started in June of 2016 and concluded within the same month. To avoid bias, the researcher randomly selected

patients that were evaluated in the last year in the rural health clinic and determined if they had a diagnosis of T2DM.

Population

The population to be studied is individuals over 18 who have been diagnosed with T2DM and who are patients at the rural health clinic in which the author works. Since the data collected will be retrospective, there will not be any participant recruitment, but rather a random sampling of data obtained from patient charts. Inclusion criteria of the sample was adults over the age of 18 with a diagnosis of T2DM, who have at least one year of documented patient visits and lab work in their medical records. Specific information that will need to be within the documentation is: hemoglobin A1C levels, blood pressure, LDL cholesterol, and BMI that have been recorded within the last year. Exclusion criteria included: patients that have been diagnosed with type 1 diabetes, individuals under the age of 18, any individual who is currently pregnant, has evidence of debilitating mental illness, or is not able to independently manage their disease.

Protection of Human Subjects

To preserve the identity of the subjects studied, no patient identification was obtained in data collection. After necessary data was extracted from patient charts, it was entered into a spreadsheet, and each patient was randomly assigned a number between 1-50. All data collection was conducted on clinic premises; therefore, no patient identifiers left the clinic setting. In accordance with both the researcher's affiliated university and place of employment, all criteria for including human subjects in data collection was upheld for the entire process of data collection, analysis, and presentation. To begin the

retrospective study design, health information was assessed after approval from the hospital's human resources department and Pittsburg State University. Prior to collecting data, this author engaged in a mutual agreement between the affiliated hospital, to ensure data was collected and recorded appropriately and in accordance with hospital regulation.

Procedure

Data was collected and concluded in the summer of 2016. By obtaining data that may further justify the use of DSME for the population of patients with T2DM, the researcher collected data on variables essential to their health. This research was conducted to determine how well a random sample of 50 patients are controlled in the way of blood pressure, BMI, LDL cholesterol, and hemoglobin A1C. Through this research, the need for further interventions such as DSME may be evident.

Once approval was granted, this author started data collection of 50 patient charts that were evaluated within the year and have a diagnosis of T2DM. Technology included this author's personal, password-protected computer on which patient data was collected and then entered manually into a computerized spreadsheet. Resources needed to conduct research were minimal. Personnel included this researcher and help from clinic staff to view patients that have evaluated in the clinic within the last year. Because the affiliated hospital does not currently utilize electronic medical records, electronic scheduling was utilized to pull paper charts from the first and third Tuesday of every month for the last year. Once those charts were identified and were determined to have a confirmed diagnosis of T2DM and have had a diabetic visit with lab work within the last year including hemoglobin A1C, cholesterol, BMI, and blood pressure, they were added to the

sample. Data collected included the most recent lab values for each participant. If the chart met all of the above criteria, they were deemed eligible for research. Those charts will then be set aside for data extraction.

Information collected was only viewed by the researcher and was entered into a password encrypted data entry system. As data was collected, no patient names were entered but was randomly numbered 1-50. The aforementioned characteristics were entered into the system and no patient data was duplicated. The process to determine eligible subjects has been discussed previously and all inclusion and exclusion was upheld through the duration of data collection.

Limitations

Limitations in this study involve a sampling of charts in which data was extracted. The size of the sample could be considered low at 50 subjects because it may not reflect the entire T2DM population. Data was collected from one location, which could also be considered a further limitation because it doesn't depict the health of patients in the entire southeast Kansas area.

The components of DSME involve personal goal setting and self-improvements, but for the purpose of this research, exercise, medication, and dietary compliance were not included in data collection due to time constraints and no physical interactions with the human subjects. Other identified limitations were no comparison group of subjects that have received DSME, which could have been beneficial to show the effects of the intervention and compare to those who have not received DSME as an intervention.

Evaluation Plan

The purpose of data collection was to measure crucial determinants of the overall health of 50 T2DM patients. In calculating the means of the patient's hemoglobin A1C, LDL cholesterol, blood pressure, and BMI, their disease related control can be determined as well as risk for further co-morbidities and any need for additional interventions, such as DSME.

After the collection of data, the process of analysis started with calculating the mean for the four T2DM patient values discussed above. The data was collected, analyzed, and divided by age groups and gender. In the following chapter, graphs will be divided into the following age groups for both males and females: 18-30, 31-40, 41-50, 51-60, 61-70, 71-80, and 81-90 year olds.

The graphs identify the T2DM sample's overall control in four crucial aspects of health based upon the normal values that have been previously discussed. Hemoglobin A1C levels are a definitive representation of the patient's glycemic control (ADA, 2016). The other measures of blood pressure, BMI, and LDL cholesterol are of importance and appropriate for inclusion because they are critical components to long-term disease management (ADA, 2016). If not controlled, they could lead to other co-morbidities or premature death. Depending on what the analysis shows, future plans for population specific interventions could be underway.

Plan for Sustainability

The goal of this research was to analyze a sample of T2DM patients on four determinants of their overall health. The mean levels of the population being studied were

compared to the recommendations provided by the American Diabetes Association. If the levels are higher than normal, justification for the development of a DSME program could be argued. Strategies to develop a DSME program would be a multidisciplinary approach and a comprehensive plan for sustainability would be essential. By presenting the information to important stakeholders in the Southeast Kansas community, the process for DSME program implementation and a framework for development could be initiated.

The realities of program development would have to be considered. The National Standards for Diabetes Self-Management Education would be utilized as a framework and all objectives would be met during program development. The first and second standards reflect the need to build a strong network of diabetes educators, nurses, physicians, and pharmacists to develop a mission statement and goals for the T2DM population to ensure effective education. Standards three and four examine the needs of the population, resources available, and the delegation of a coordinating person to oversee the planning and implementation of this program. Standards five and six focus on the DSME educator who provides evidence based management skills to the T2DM population by following an established written curriculum that educates on the AADE7 Self-Care Behaviors discussed in the previous chapter. Standard seven assesses the individual needs of the T2DM patient and establishes a plan of care appropriate for their disease process and management. Standard eight ensures that regular follow-up and ongoing support are available and offered to the T2DM patient. Standard nine assesses how patient-centered goals have been met and evaluates the intervention of DSME.

Standard ten is the most critical element of program sustainability because it focuses on the entire education process and ways to continuously improve DSME. (Brown et al., 2012)

Summary

Throughout this section, there was a discussion of the population to be studied, procedure for data collection, and implications for data analysis. By obtaining data and calculating the means on four crucial determinants of the T2DM population's overall health, we can assess if further interventions, such as the addition of DSME, would yield improvements in the T2DM patient's disease management. In the following chapter, there will be an analysis of data collected and findings will be presented in a succinct table format.

Chapter IV

Evaluation Results

Purpose

The purpose of this study was to analyze data on a sample of T2DM patients to determine how well the sample maintains glycemic control and reduces risks for disease related complications. This analysis provides evidence to the need for a DSME program in a Southeast Kansas (SEK) rural health clinic. Through data analysis, we can determine if this population could benefit from a DSME program to better serve in the management of their chronic illness. In this chapter, there will be a discussion of the population that was studied and analysis of data collected in relation to the project's purpose.

Sample

Data was collected through a retrospective chart analysis on a sample of 50 patients' health information. Once approval was granted through Girard Medical Center and Pittsburg State University, patient data was collected in the summer of 2016. Inclusion criteria included patients over the age of 18 who have a diagnosis of T2DM, have had a visit with lab work, and reside in the rural SEK community. Patients who had been diagnosed with type 1 diabetes, individuals under the age of 18, individuals who are

currently pregnant, have evidence of debilitating mental illness, or are not able to independently manage their disease were excluded from data collection.

Data was analyzed and divided by age groups and gender. In the following chapter, graphs will be divided into the following age groups for both males and females: 18-30, 31-40, 41-50, 51-60, 61-70, 71-80, and 81-90 year olds. The process of analysis began with determining the mean for the four T2DM patient values: blood pressure, BMI, LDL cholesterol, and hemoglobin A1C.

Analysis of Project Questions

The National Guideline Clearinghouse (2012) discusses the role of education as being a crucial component in the self-management of T2DM. The purpose of the research was to examine the glycemic control and reduction of risk factors in a sample of T2DM patients. To reflect on the questions discussed in chapter one, the current health status of the T2DM population was above the recommendations provided by the ADA in 3 of the lab values examined. Hemoglobin A1C, LDL Cholesterol, and BMI were above the recommendations as defined in the previous section. The average blood pressure of the sample population did meet the recommendations provided by the ADA.

The second main project question to be addressed was whether there was a need for a DSME program in the SEK rural health community. Through data analysis and a review of literature, it has been determined that a DSME program would be a beneficial adjunct to the primary care provider and would be an appropriate addition to the community.

Key Terms

For the purposes of this research, the mean was viewed as the most valuable determinant in analyzing data. The mean is defined as the average of individual lab values. In this analysis of data, there were four categories of lab values collected. The following tables depict the research by establishing the mean of Hemoglobin A1C, blood pressure, BMI, and LDL cholesterol for research subjects with considerations for gender and age group.

Data Analysis

Table 1. Gender of research subjects

Gender	Frequency (n=50)	Percent (%)
Males	34	68
Females	16	32

The total number of research subjects was 50 individuals. There were 16 female subjects, which comprised 32% of the sample population and 34 male subjects, which comprised 68%.

Table 2. Age of research subjects

Age	Frequency	Percent
18-31	0	0%
31-40	0	0%
41-50	2	4%
51-60	28	56%
61-70	16	32%
71-80	4	8%
81-90	0	0%

Subjects were divided into age groups when analyzing data. With random selection of subjects, there were no subjects that met the criteria for the age groups: 18-31, 31-40, and 81-90. Two subjects were selected for the age group 41-50 or 4%. In the age group 51-60, there were 28 subjects randomly selected or 56% of the total study subjects. In the 71-80 age group, there were four subjects, or 8% of the study subjects.

Table 3. Age of research subjects, divided by gender.

Age	Males	Percentage	Females	Percentage
18-31	0	0	0	0
31-40	0	0	0	0
41-50	2	4%	0	0
51-60	22	44%	6	12%
61-70	8	16%	8	16%
71-80	2	4%	2	4%
81-90	0	0	0	0

This table further breaks down the research subjects for each age group. There were two male subjects in the 41-50 age group and no female subjects. There were 22 male subjects and six female subjects in the 51-60 age group. In the 61-70 age group, there were an equal number of males and females, with 8 subjects from each. The final age group, 71-80 had two research subjects from each the male and female divisions.

Table 4. Number of subjects for each hemoglobin A1C range, mean hemoglobin A1C for each age group, divided by gender.

Hemoglobin A1C%	Age	Males Frequency	Mean A1C% for age group	Females Frequency	Mean A1C% for age group
	41-50		7.2%	0	n/a
<6%					
6.01-7.00		1			
7.01-8.00		1			
8.01-9.00					
9.01-10.00					
>10.01					
	51-60		8.3%		7.4%
<6%		0			
6.01-7.00		3		3	
7.01-8.00		10		3	
8.01-9.00		8			
9.01-10.00		1			
>10.01					
	61-70		7.5%		7.6%
<6%		0			
6.01-7.00		1		1	
7.01-8.00		5		6	
8.01-9.00		2		1	
9.01-10.00					
>10.01					
	71-80		7.25%		6.8%
<6%		0			
6.01-7.00		1		2	
7.01-8.00		1			
8.01-9.00					
9.01-10.00					
>10.01					

There were no subjects in the age groups; 18-30, 31-40, and 81-90. In the age group 41-50, there were two male subjects with a mean hemoglobin A1C of 7.2% and no female subjects in this age group. In the 51-60 age group there were 22 male subjects

with a mean hemoglobin A1C of 8.3%, which was the highest recorded reading for any male age group. In the same age division, there were 6 female subjects and a mean hemoglobin A1C of 7.4%. The 61-70 age group had 8 male subjects with a mean hemoglobin A1C of 7.5% and for the 8 female subjects 7.6%. This age group was the highest recorded A1C for females. The final age division that had subjects was the 71-80-year-old group with two males and two female subjects. The male division had a mean hemoglobin A1C of 7.2%, while the females mean was at 6.8%

Table 5. Blood pressure mean, divided by age and gender.

Age	Male Mean blood pressure (mm/Hg)	Female Mean blood pressure (mm/Hg)
18-30	n/a	n/a
31-40	n/a	n/a
41-50	126/76	n/a
51-60	130/81	134/77
61-70	128/78	122/73
71-80	132/75	130/76
81-90	n/a	n/a

There were no research subjects for the age groups discussed previously. Blood pressure values are easily identified for each age group, with the highest recorded mean for males in the 51-60 age group at a mean blood pressure of 130/81 mm/Hg. In the same age group, females had the highest mean blood pressure of 134/77 mm/Hg.

Table 6. BMI mean according to age and gender.

Age	Male Mean BMI (%)	Female Mean BMI (%)
18-30	n/a	n/a
31-40	n/a	n/a
41-50	35.8	n/a
51-60	33.6	34.2
61-70	31.7	28.1
71-80	27.2	26.8
81-90	n/a	n/a

There were no research subjects for the age groups discussed previously. Mean BMI values are recorded for each age group, with the highest recorded mean for males in the 41-50 age group at a mean BMI of 35.8. In the age group 51-60, females had the

highest mean BMI of 34.2. Both males and females in the 71-80 age group had the lowest mean BMI of 27.2 and 26.8, respectively.

Table 6. LDL mean according to age and gender.

Age	Male Mean LDL Cholesterol (mg/dL)	Female Mean LDL Cholesterol (mg/dL)
18-30	n/a	n/a
31-40	n/a	n/a
41-50	112	n/a
51-60	158	116
61-70	134	103
71-80	119	125
81-90	n/a	n/a

There were no research subjects for the age groups discussed previously. Mean LDL values are recorded for each age group, with the highest recorded mean for males in the 51-60 age group at 158 mg/dL. Females had the highest mean LDL in the 71-80 age group at 125 mg/dL.

Summary

Results from data analysis revealed findings in the study that were relevant to the purpose of the research. Earlier in the discussion, desired lab values were established for four of the lab values to be extracted from patient data. For the T2DM population maintaining personal values that are at a desired range signifies disease related control and is a predictor of long-term disease management.

Maintaining an mean hemoglobin A1C of <7.0 % indicates glycemic control. The mean hemoglobin A1C % for the male population was 7.6 %. The mean hemoglobin

A1C of the female population was 7.3%. The results of the research subject's hemoglobin A1C levels concluded that the mean hemoglobin all research participants was 7.45 %. Overall, this percentage is close to desired levels for the T2DM population but still over the recommendations provided by the ADA.

The remaining three determinants of health were meand for both male and female population and categorized into age groups. The population with T2DM should maintain blood pressure levels around 120/80 mmHg (ADA,2016). The research concluded that the male subjects had an mean blood pressure of 129/78 mmHg, while female population had an mean blood pressure of 128/75 mmHg. The mean systolic value for both genders is slightly higher than the recommended 120 mmHg, while the mean diastolic pressure for both male and female subjects was right on target at less than 80 mmHg.

Obesity and the development of T2DM are closely related. The research subjects have already been diagnosed with T2DM, but mainiting a healthy body weight and normal BMI benefit this population by reducing premature mortality and disease related complications. The mean BMI for the male population was 32%. This level is outside of healthy parameters and is in the obese category. The female subjects' mean BMI was 29.7% and is in overweight category.

The American Diabetes Association (2016) recommends that individuals with diabetes keep LDL levels at or below 100 mg/dL, or under 70 mg/dL if they also have cardiovascular disease (ADA, 2016). The last lab value collected for data analysis was the LDL cholesterol for the T2DM sample. The mean male LDL cholesterol was 130mg/dL, and the mean female LDL was 114mg/dL. The entire sample studied was

above the ADA's recommendation for the T2DM population. The purpose of this research was to determine where the sample population stands in four crucial determinants of health. The rationale for this research was to argue the need for addional interventions outside of primary care alone. With this analysis of data, it can be concluded that outside interventions are warranted.

Chapter V

Discussion

The purpose of this research was to analyze patient data to determine the overall disease management of the T2DM population. With this data, support for a DSME program in a southeast Kansas rural health clinic can be justified. Through data analysis, it was determined the T2DM population could benefit from additional interventions such as a DSME program to better serve in the management of their chronic illness.

Relationship of Outcomes to Research

To reflect on the project questions, an established framework for diabetes self-management education was found through a review of the literature. National standards were developed to ensure this population is receiving the type of education needed to assist in independent decision making and disease management. According to the national standards of DSME, there should be a stepwise approach to educating the T2DM patient by a pre-educational assessment and individualized goals and plan.

Diabetes education can be given in a variety of personalized or group settings by certified diabetes educators, healthcare providers, or trained community members (CDC,2016). The major responsibilities of this person is to provide patients with self-management skills that have consistently proven to be crucial in the independent

management of T2DM. In conjunction with the national standards of DSME, the essential components of diabetes education are described in the AADE-7 self-care behaviors. These practices will provide the patient educational experiences of the disease process and skills necessary for maintenance.

When analyzing the health status of the T2DM population in the SEK rural area, the research focused on four determinants of health that were discussed in the previous section. Data was displayed in table format to show the statistical breakdown of the T2DM population. The four lab values studied were BMI, blood pressure, LDL cholesterol, and hemoglobin A1C. While hemoglobin A1C is specific to glycemic control, the subsequent lab values are important aspects to the T2DM patient's overall health. Values that are congruent with the ADA recommendations, have proven to reduce cardiovascular risk and premature death.

The research subjects were over the recommendations provided by the ADA in each four lab values. The mean hemoglobin A1C % for the male and female population was 7.6 %. and 7.3%, respectively. The results concluded that mean value is close to the desired value of 7.0% for patients that have a diagnosis of T2DM. Despite the mean hemoglobin A1C of 7.45% for the entire population studied, subjects within the study had hemoglobin A1C levels as high has 9.2%. This signifies that there are individuals in this demographic area with mean blood sugars in the 200 mg/dl range, well above the ADA recommendations.

The analysis of blood pressure levels for the sample studied revealed levels that were in the pre-hypertensive range for some research subjects. The ADA discusses that

two out of three Americans diagnosed with T2DM, also have a diagnosis of hypertension (ADA, 2016). While it was not determined how many of this study's subjects had an additional diagnosis of hypertension, rising blood pressure levels contribute to an increased risk for stroke and heart disease. Through diabetes education, information on the importance of reducing risks and taking all medications, is included in the discussion of self-care.

The mean BMI for the male population was 32%. This level is outside of healthy parameters and in the obese category. The female subject's mean BMI was 29.7%, which is categorized as overweight. Recommendations for weight loss and exercise can be encouraged through DSME participation. The sample studied, was above the recommendations the ADA provides on LDL levels. The male population had LDL cholesterol levels at 130mg/dL and female LDL cholesterol levels at 114mg/dL. Along with exercise, this population can benefit from discussion on healthy eating and a comprehensive dietary plan.

Observations

Outcomes observed through data analysis, were overall the sample studied was outside of desired parameters in the four crucial determinants of health. While some of the subjects studied did maintain lab values that were consisent with desired ranges, the mean values signified levels higher than that the American Diabetes Association deems appropriate for individuals with a diagnosis of T2DM.

Other observations made in the study were the lack of study subjects for age groups 18-30, 31-40, and 81-90. While there may be individuals in this age group who

have been diagnosed with T2DM, none were obtained in the random selection of data. Other considerations for this finding could be individuals in this age group have not had a diagnosis of T2DM yet and are in the population of individuals with pre-diabetes.

Evaluation of Theoretical Framework

Results from this research can compare nursing theorist Nola Pender's Health Promotion Model to predict the effect of DSME on the T2DM patient. Pender discusses the individual's characteristics, experiences, and behaviors lead to a particular outcome. In this instance, obesity, poor dietary intake, and lack of exercise, may have contributed to the development of T2DM for a vast majority of the study's subjects. The clinical experiences and diabetes education within the primary care setting have provided the population with some progress in the way of disease management, but it would be prudent, with lab values still above the recommendations of the ADA, to explore additional educational opportunities. The theoretical framework's general statement was "behaviors should result in improved health, enhanced functional ability and better quality of life at all stages of development" (Nursing Theorists, 2015). The hope and purpose for DSME as an intervention, is it will provide patients with a diagnosis of T2DM and the SEK population with transformational experiences that reconfigure their lifestyles.

Evaluation of Logic Model

In the first chapter, a logic model was established to show the realtionship of a DSME program and the short, intermediate, and long term outcomes it could have on the T2DM population. The logic model shows the process of development and the essential components of implementation with desired outcomes. In reflection of the national standards of care, healthcare provider input and participation was considered an invaluable attribute to the beginning stages of program development. Through a retrospective chart review of the sample population, comparison was made between the population and desired lab values. Based upon this data analysis, it was determined further education was warranted and could vastly improve the population's disease control.

The logic model describes input from an experienced diabetes educator to give first hand testimony of the positive effects of DSME on the T2DM patient. The extensive education provided to the patient allows them to utilize preventative health services for disease surveillence, rather than emergency room visits when complications arise. The logic model displays DSME as an intervention, while showing improvements in patient compliance, knowledge of the disease process and maintainence, and the ability to make self-care decisions that lead to improved outcomes.

Limitations

The method chosen for the research subjects was a random retrospective chart analysis. One consideration for bias was the subjects in the study had been evaluated within the year and therefore may have better disease management. These subjects may

not reflect the SEK community as a whole and only provide lab values for T2DM patients that in the very least have received healthcare in the past year. Finding the mean value for the subject's four lab values was the most appropriate method to analyze the sample as a whole, but there were some subjects well above the desired level.

Time was a factor in data collection and analysis. The information was collected and analyzed independently by this author. If more time was allowed for additional research was to be conducted, it would be beneficial to evaluate the research subjects after DSME intervention. This could be conducted by comparing the subjects four lab values at pre-DSME intervention and again one year from the start of diabetes education through a post-DSME intervention analysis.

Implications for Future Projects

With the growing number of T2DM patients, the exploration of ways the population can be monitored is crucial. Statistics in the Crawford County Kansas area recognize the growing number of obese individuals and T2DM patients. The prevelance of these cases will only continue to increase unless measures are taken to not only reduce the disease complications for those who have been diagnosed, but to also reverse the disease progression for those who are dangerously close to receiving a new diagnosis of T2DM.

With evident need for additional resources for the T2DM population, it would be beneficial to move on to the development and implementation phases to initiate a DSME program for the SEK rural health clinics. Future plans would utilize the CDC's community readiness program and resources for developing community programs, to

specifically aid the SEK rural health community in the development of a DSME program. Through collaboration with stakeholders in the community, such as certified diabetes educators, pharamacists, and local physicians, an education program in the demographic area can be built and utilized by the SEK community.

To improve and elaborate upon the design of this author's project, it would be beneficial to analyze data from patients who have received DSME for a determined time period. Currently, this research shows only the sample population's lab values with diabetes education in the primary care setting alone. If future research was conducted, comparing the pre and post lab values of individual's receiving primary care alone vs. individual's that receive both primary care and individualized care from a DSME support group or diabetes educator would hopefully provide evidence to support the need for DSME. Once the DSME program was launched within the community, evaluating the subjects at regular intervals will show efforts for disease surveillance and the effect DSME has on the four lab values that were initially evaluated.

Implications for Practice

The significance of the study's findings show the T2DM population is not fully meeting the expectation of disease management in BMI, blood pressure, LDL cholesterol, and hemoglobin A1C. The lab values analyzed provide insight into glycemic control and reduction of disease related complications. Statistics at both the local and national level show a continous rise in the number of T2DM individuals. Surveillance for the T2DM population is crucial. Once the positive effects of DSME are evident in the population, health care providers should make additional efforts to provide their patients with the

earliest opportunities for DSME referral. The National Guideline Clearinghouse (2012) discussed education as an essential compontent to the care of the T2DM patient. Just as it is important for the patient, it is important for Advanced Practice Nurses to be educated on DSME as an invaluable resource for this population.

Promoting DSME referrals and discussing the importance of diabetes education should be included in the implications for treatment of the T2DM patient. Just as medication adhearance and regular blood sugar monitoring is important, discussing these educational opportunites that are available in the community, enforces the importance of DSME to the patient.

In the state of Kansas, regular surveillance of disease progression has already been a focal point for health officials. There has been an evident need for health policy reform to focus on the T2DM epidemic and how it impacts the Department of Health and Human Services and their assistance with public health services, specifically diabetes programs. The Department of Health and Environment discusses the financial impact that diabetes brings forth, not only on their department, but also on the state and localities. House Bill number 2032 was introduced by the Committee on Health and Human Services on January 15th, 2015. This bill discusses the need for change by encouraging the population with T2DM to maintain a healthy life style while reducing complications. House Bill number 2032 discusses a comprehensive plan on ways to improve care throughout Kansas in hopes for state and community wide decreases in the prevalence of the disease and reduction of associated disparities. Written in this bill was the expectation of regular disease surveillance, both short and long term and the urgency for available

community programs for the T2DM population. There is an expectation that programs in the state of Kansas will be regularly examined and methods to reach this population are essential. The legislative bodies will set goals for the population with pre-diabetes and diabetes to reduce further complications while enacting an action plan for disease management to reduce the financial burden throughout the state (Kansas Legislature, 2015).

House Bill number 2032 was passed on February 13, 2015. One of the focuses of the bill was for regular surveillance of diabetes reporting and regular monitoring of available education programs and the progress of the T2DM population. The Bill introduced an initiative to revise the approach of T2DM care and education. It was apparent in the state of Kansas, with the rising numbers of T2DM patients, serious interventions were crucial. With a focus on diabetes reform, communities in Kansas will hopefully see more DSME programs available to provide educational opportunities to the area residents. Education on exercise, medications, reducing risks, and access to diabetes educators will provide the population with goals for individual improvement. With these resources available, healthcare professionals, hospitals, and health departments will hopefully see a reduction in the number of uncontrolled T2DM patients evident by reduced emergency room visits and an increase in the utilization of preventative services (Kansas Legislature, 2015).

Efforts by the Department of Health and Human Services have been effective in educating legislative officials that diabetes affects many individuals and needs to be undertaken by an extensive action plan and multidisciplinary approach. Through the

passing of House Bill number 2032, the groundwork has been set to begin the path for diabetes reform in Kansas. By addressing the problem at both the state and local level, attempts to lower the disease prevalence and progression are underway. Regular surveillance of disease progression should be made at scheduled intervals and benchmarking will occur to ensure access to quality education programs. During the process, intervention analysis would be encouraged to ensure the T2DM population is staying on track. The Health and Human Services initiated a positive effort and acknowledgement for change in the care of the T2DM population. The participation of healthcare providers would provide perspectives on methods for diabetes reform and ensure progress towards a healthier future for all individuals (Kansas Legislature, 2015).

Conclusion

The purpose of this study was to analyze data on a sample of T2DM patients to determine how well the sample maintains glycemic control and reduces risks for disease related complications. This analysis provides evidence to the need for a DSME program in a Southeast Kansas (SEK) rural health community. Hemoglobin A1C is the most definitive represenation of the patient's glycemic control, while BMI, blood pressure, and LDL cholesterol give insight into reduction of cardiovascular risks, morbidity, and pre-mature death (ADA,2016). It was apparent through data analysis, the sample population studied did not meet the recommendations provided by the ADA. With this knowledge, future plans for the development and implematation of a DSME program in the SEK rural health area would provide the community access to essential diabetes education. This study has contributed to nursing knowledge by focusing on education as a crucial

component to disease management, and has just as much value in the treatment as medication. Healthcare providers should be made aware of the resources for the T2DM patient and recognize that early referalls to DSME can be an invaluable attribute to the patient.

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APPENDIX

GIRARD
Medical Center

June 22, 2016

Michael Payne, CEO
Girard Medical Center
302 North Hospital Drive
Girard, Kansas 66743

To: Pittsburg State University Office of Continuing and Graduate Studies and the Irene Ransom Bradley School of Nursing, Pittsburg State University

This letter is in reference to Astlleigh Heter, MSN, APRN, a Doctor of Nursing Practice student at Pittsburg State University. I am formally giving permission for Ms. Heter to collect data at the Girard Medical Center of Frontenac Clinic. The data collected will not contain any patient identifiers and the identity of all subjects will be preserved.

Sincerely,

Michael Payne, CEO
Girard Medical Center

Print Form

This is a fillable form

Pittsburg State University
Application for Approval of Investigations
Involving the Use of Human Subjects

This application must be completed by the Investigator and sent to the Office of Continuing and Graduate Studies by the first Tuesday of the month during the fall and spring academic semesters to be considered for full review on the second Tuesday of the month. Expedited and exempt reviews can be turned in any time. For questions about the review process contact Brian Peery in Russ Hall, 112, Ext. 4175.

1. Investigator(s) Name(s): Ashleigh Hicks Department: Nursing
2. Local Address: 2302 S. Rouse
3. Phone: 636-484-2746 E-mail Address: ahollinger@gus.pittstate.edu
4. Project Title: Diabetes Self-Management & Insulin Administration ...
5. Expected Starting Date: May 16 Expected Completion Date: July 16
6. Is this project (check all that apply): Use review criteria in Form CR-1 to determine which category of review applies.

- [ ] Application for Full Review
- [ ] Application for Expedited Review
- [x] Application for Exempt Review
- [ ] Protocol Change
- [ ] Continued Review
- [ ] Faculty Research
- [x] A Class Project
- [ ] Thesis/Special Investigation
- [ ] Being submitted for external support
- [ ] Being conducted in a foreign country
- [ ] Publishable research

7. If notification of human subject approval is required give date required. ________

Name of agency: ________

8. If you are a student, complete the following:

Faculty Sponsor: Karen Johnson Department: Nursing Phone: 235 6187

**** If submitted externally, a complete copy of the proposal must be submitted to the IRB.****

CERTIFICATION AND APPROVAL

Certification by Investigator: I certify that (a) the information presented in this application is accurate, (b) only the procedures approved by the IRB will be used in this project, (c) modifications to this project will be submitted for approval prior to use, and that all guidelines outlined in the PSU Policy and Assurance Handbook for the Protection of Human Research Subjects will be followed as well as all applicable federal, state and local laws regarding the protection of human subjects in research as outlined in Form VA-1

Ashleigh Hicks 5.9.16

Signature of Investigator Date

Faculty Sponsor: If the Investigator is a student, his/her Faculty Sponsor must approve this application.
I certify that this project is under my direct supervision and that I accept the responsibility for ensuring that all provisions of approval are met by the investigator.

Karen Johnson 5.9.16

Signature of Faculty Sponsor Date

Department Review Committee Chair: I acknowledge that this research is in keeping with the standards set by our department, university, state and federal agencies and I assure that the student principal investigator has met all departmental requirements for review and approval of this research.

[signature] 5/9/16

Signature of Department Review Committee Chairperson Date

[signature] 6/27/16

CPHRS Chairperson Date