

Pittsburg State University

Pittsburg State University Digital Commons

Doctor of Nursing Practice Scholarly Project

Irene Ransom Bradley School of Nursing

Spring 5-10-2019

A PRE AND POST SURVEY TO EVALUATE PATIENT PERCEPTION OF GROUP DIABETES SELF-MANAGEMENT EDUCATION IN RURAL HEALTH CLINICS

Stormy Carter

Pittsburg State University, stormycarter@gus.pittstate.edu

Follow this and additional works at: <https://digitalcommons.pittstate.edu/dnp>



Part of the [Nursing Commons](#)

Recommended Citation

Carter, Stormy, "A PRE AND POST SURVEY TO EVALUATE PATIENT PERCEPTION OF GROUP DIABETES SELF-MANAGEMENT EDUCATION IN RURAL HEALTH CLINICS" (2019). *Doctor of Nursing Practice Scholarly Project*. 20.

<https://digitalcommons.pittstate.edu/dnp/20>

This Scholarly Project is brought to you for free and open access by the Irene Ransom Bradley School of Nursing at Pittsburg State University Digital Commons. It has been accepted for inclusion in Doctor of Nursing Practice Scholarly Project by an authorized administrator of Pittsburg State University Digital Commons. For more information, please contact digitalcommons@pittstate.edu.

A PRE AND POST SURVEY TO EVALUATE PATIENT PERCEPTION OF GROUP
DIABETES SELF-MANAGEMENT EDUCATION IN RURAL HEALTH CLINICS

A Scholarly Project Submitted to the Graduate School
in Partial Fulfillment of the Requirements
for the Degree of
Doctor of Nursing Practice

Stormy Carter, BSN, RN

Pittsburg State University

Pittsburg, Kansas

May 2019

A PRE AND POST SURVEY TO EVALUATE PATIENT PERCEPTION OF GROUP
DIABETES SELF-MANAGEMENT EDUCATION IN RURAL HEALTH CLINICS
CLINICS

Stormy Carter, BSN, RN

APPROVED:

DNP Scholarly Project Advisor _____

Dr. Ashleigh A. Heter, DNP, APRN, FNP-C, School of Nursing

Committee Member _____

Dr. Amy L. Hite, DNP, APRN, FNP-C, School of Nursing

Committee Member _____

Dr. Greg Belcher, KCCTE & Professor

Committee Member _____

Dr. Amanda Alonzo, Ph.D., MSN, CNE, School of Nursing

Acknowledgments

I want to express my great appreciation to Dr. Ashleigh Heter, Dr. Amy Hite, and Dr. Greg Belcher for their valuable and constructive suggestions during the planning and development of this research work. I would also like to thank Nancy Evans for enabling me to visit the diabetes education sessions at Community Health Centers of Southeast Kansas. Finally, I would like to thank my family for their endless support and patience.

A PRE AND POST SURVEY TO EVALUATE PATIENT PERCEPTION OF GROUP DIABETES SELF-MANAGEMENT EDUCATION IN RURAL HEALTH CLINICS

An Abstract of the Scholarly Project by
Stormy Carter

Diabetes is a significant clinical issue in the primary care setting. Providers struggle to overcome barriers to facilitate therapeutic interventions for populations served. The specific aim of this study was to assess group diabetes self-management education from a patient perspective. Evaluation of diabetes knowledge and confidence of diabetes management was conducted in rural primary care clinics. This study utilized a one-group pretest-posttest design to patients receiving group diabetes self-management education in Southeast Kansas rural primary care clinics by a certified diabetes educator. The surveyed population included individual's ages 18-65 with prediabetes, type 1, or type 2 diabetes who received DSME education between December 1, 2018, and February 28, 2019, at five rural primary care clinics in Southeast Kansas. A paired t-test was run on a sample of 31 DSME participants to determine whether there was a statistically significant mean difference between pretest and posttest scores of diabetes knowledge and confidence before and after DSME. The project results showed an increase between pre and post diabetes knowledge of 1.2 points and an increase in self-management confidence of 1.3 points. These findings determine that DSME can be beneficial for increasing diabetes knowledge and confidence for diabetes management.

Keywords: Diabetes education, diabetes guidelines, certified diabetic education, diabetes self-management education (DSME).

TABLE OF CONTENTS

CHAPTER	PAGE
CHAPTER I.....	1
Introduction.....	1
Description of the Clinical Problem	2
Significance.....	4
Purpose.....	4
Theoretical Framework: Orem’s Self-Care Deficit Nursing Theory	5
Project Questions	8
Summary.....	12
CHAPTER II.....	14
Review of Literature	14
Complications of Diabetes.....	15
Standards of Medical Care in Diabetes.....	16
Prediabetes Recommendations	17
Type 2 Diabetes Recommendations.....	19
Type 1 Diabetes.....	20
Healthy Behavior Measurement Instruments.....	21
Barriers of Diabetes Self-Management.....	23
Summary.....	25
CHAPTER III	26
Project Design.....	26
Methods.....	26
Project Site and Population.....	27
Data Collection	28
Measurement Instruments.....	28
Ethical Considerations/Protection of Human Subjects.....	29
Data Analysis	29
Reliability and Validity	29
Analytical Methods.....	30
Timeline	30
Budget.....	31
Strengths and Weakness of the Study	31

Summary	32
CHAPTER IV	33
Evaluation Results	33
Purpose.....	33
Sample.....	33
Analysis of Project Questions.....	34
Research Question One.....	34
Research Question Two	37
Research Question Three	41
Summary	45
CHAPTER V	47
Discussion.....	47
Purpose.....	47
Relationship of Outcomes to Research.....	47
Observations	50
Evaluation of Theoretical Framework	51
Evaluation of Your Logic Model	51
Limitations	52
Implications for Future Projects and Research	53
Implications for Practice/Health Policy/Education.....	53
Conclusion	54
References.....	56
APPENDIX.....	61

Tables

TABLE.....	PAGE
1. Pretest Average of Response to Individual Items on Knowledge.....	35
2. Posttest Average of Response to Individual Items on Knowledge.....	36
3. Summative Average of Diabetes Knowledge.....	37
4. Pretest Average of Response to Individual Items on Confidence.....	38
5. Posttest Average of Response to Individual Items on Confidence.....	39
6. Summative Average of Diabetes Confidence.....	40
7. Paired Sample Statistics.....	40
8. Frequency and Percent of Participant Age.....	41
9. Frequency and Percent of Participant Gender.....	42
10. Frequency and Percent of Participant Race.....	42
11. Frequency and Percent of Participant Education.....	42
12. Frequency and Percent of Participant Employment Status.....	43
13. Knowledge of Diabetes Status.....	43
14. Type of Diabetes.....	43
15. Participation in Diabetes Program.....	44

Figures

Figure 1. DSME and Nursing Intervention.....	7
Figure 2. Logic Model.....	11

CHAPTER I

Introduction

Diabetes remains the seventh leading cause of death in the United States with over 30 million Americans diagnosed (CDC, 2017). The Centers for Disease Control reports 8.9% of adults living in Kansas in 2015 as having a diagnosis of diabetes. This is a significant increase from 1995 where the CDC reported 4.7% of Kansas adults having diabetes. From 1995 to 2015 the number of individuals diagnosed has almost doubled. Diabetes is a chronic health condition that causes blood sugar to be higher than normal. Too much sugar can negatively impact several body systems, the most common being the eyes, kidneys, skin, heart, blood vessels, and nerves. The American Diabetes Association (2017) estimated diagnosed diabetes costs 327 billion dollars per year and found that individuals with diabetes incurred healthcare cost 2.3 times higher than individuals without diabetes. Newly diagnosed patients often lack an understanding of the disease process and effective management. One significant contributor to this problem is the absence of personalized self-management education.

Over the past decade, diabetes education has been evaluated and altered to meet the needs of individuals with low literacy levels. Misunderstood written and verbal instructions communicated to patients play a significant role in patient understanding,

adherence, disease management, and resulting in adverse events. Access to formal diabetes education is found to increase comprehension and self-management strategies. Time constraints often limit diabetes education provided in primary care clinics to handouts and brief explanations. This study assessed group diabetes self-management education received in Community Health Center offices in the Southeast, Kansas area from a patient perspective. The researcher collaborated with Community Health Centers of Southeast Kansas in Pittsburg, Iola, Parsons, Coffeyville, and Baxter Springs clinics in the process of this study. Patients from clinics in Independence and Columbus were also evaluated at the Coffeyville and Baxter Springs clinics.

Description of the Clinical Problem

Primary care clinics in Southeast Kansas lack available resources for diabetes education. Currently, there are limited outpatient diabetes education programs available in the rural community. Diabetes mellitus can be categorized into two types: type 1 and type 2 diabetes. Prediabetes is a condition that progresses into type 2 diabetes mellitus. The process and management for each type vary between individual patients. Prediabetes means a person has higher than normal blood glucose or sugar, but it is not high enough to be categorized as Type 2 diabetes (Medline Plus, 2016). Type 1 diabetes is an autoimmune condition where the body attacks beta cells (cells that produce insulin) of the pancreas resulting in very little if any insulin. This results in high blood sugar due to an inability to use or store glucose. Lastly, type 2 diabetes is a chronic condition affecting how the body uses glucose. Type 2 diabetes usually results in insulin resistance (difficulty using insulin) and abnormal insulin secretion (Campbell, 2016).

Misunderstood diabetic education is a significant health concern due to resulting health complications from poor management of glucose levels.

Diagnosis of diabetes is made from clinical presentation and plasma glucose levels. Patients with type 1 diabetes mellitus usually present with symptoms of polyuria (excessive urination), polydipsia (excessive thirst), and polyphagia (excessive hunger). Diagnosis is confirmed with clinical symptoms and random plasma glucose of 200mg/dL or a fasting plasma glucose of 126mg/dL or higher (Romesh, K., 2018). The ADA 2010 guidelines include HbA1c levels of 6.5% or higher as a criterion for a diagnosis of diabetes with confirmation from repeat testing (unless clinical symptoms present with plasma glucose of 200mg/dL or higher). Differentiation between type one and type two included assessment of urine for ketones and autoantibodies. Autoantibodies islet-cell (IA2), anti-GAD65, and anti-GAD are present in early type 1 but not type 2 diabetes (Romesh, 2018). Prediabetes is diagnosed with a HgbA1c of 5.7% to 6.4%, a fasting blood glucose of 100 to 125mg/dL, or an oral glucose tolerance test 2-hour blood glucose of 140mg/dL to 199mg/dL (American Diabetes Association, 2018).

Management of diabetes requires a collaborative effort between the patient and interdisciplinary healthcare members. Education is an essential component of self-management. Diabetes education is a collaborative process to which patients with diabetes gain understanding of disease process, disease management, and lifestyle modifications. Evaluation of current diabetes education resources along with patient knowledge and confidence of managing diabetes is needed to deliver diabetes education in the Southeast Kansas area effectively.

Significance

According to the American Diabetes Association (2017), diabetes is projected to continue to rise due to increasing risk factors. Approximately 87.5% of adults are overweight or obese, and 40.8% were physically inactive with less than 10 minutes of moderate to vigorous activity per week. Early intervention programs and self-management of individuals diagnosed with diabetes is an essential component of improving health outcomes, patient satisfaction, and efficacy of diabetes education.

The study identified areas of improvement from the patient perspective regarding the value of the current DSME program on improving self-management knowledge and confidence. Quality of care can be examined through patient experience and satisfaction. However, providers struggle with prioritizing efforts to improve patient satisfaction. Identifying areas of improvement from patient perspectives will enable healthcare providers to deliver focused and effective diabetes education. The outcomes to be considered include patient knowledge of diabetes disease process and self-efficacy interventions necessary to maintain overall positive health outcomes.

Purpose. Diabetes self-management education and support are effective in reducing healthcare cost and improving patient outcomes (American Diabetes Association, 2017). Evaluation of a multicomponent group diabetes self-management education program among adults in the SEK area is essential to establish baseline health beliefs and knowledge. Establishing baseline beliefs and knowledge will allow the CDE to determine what components of self-management education individuals perceive as the most challenging. The study will assess and evaluate areas of improvement for future program designs in rural communities over a patient perception of diabetes knowledge and ability

to manage appropriate lifestyle choices necessary both pre and post attendance of group self-management education. Numerous individuals in rural communities do not receive any formal education over the diabetes disease process and management. The overall aim is to demonstrate increased support for diabetes self-management over two key areas:

- diabetes knowledge
- self-efficacy confidence

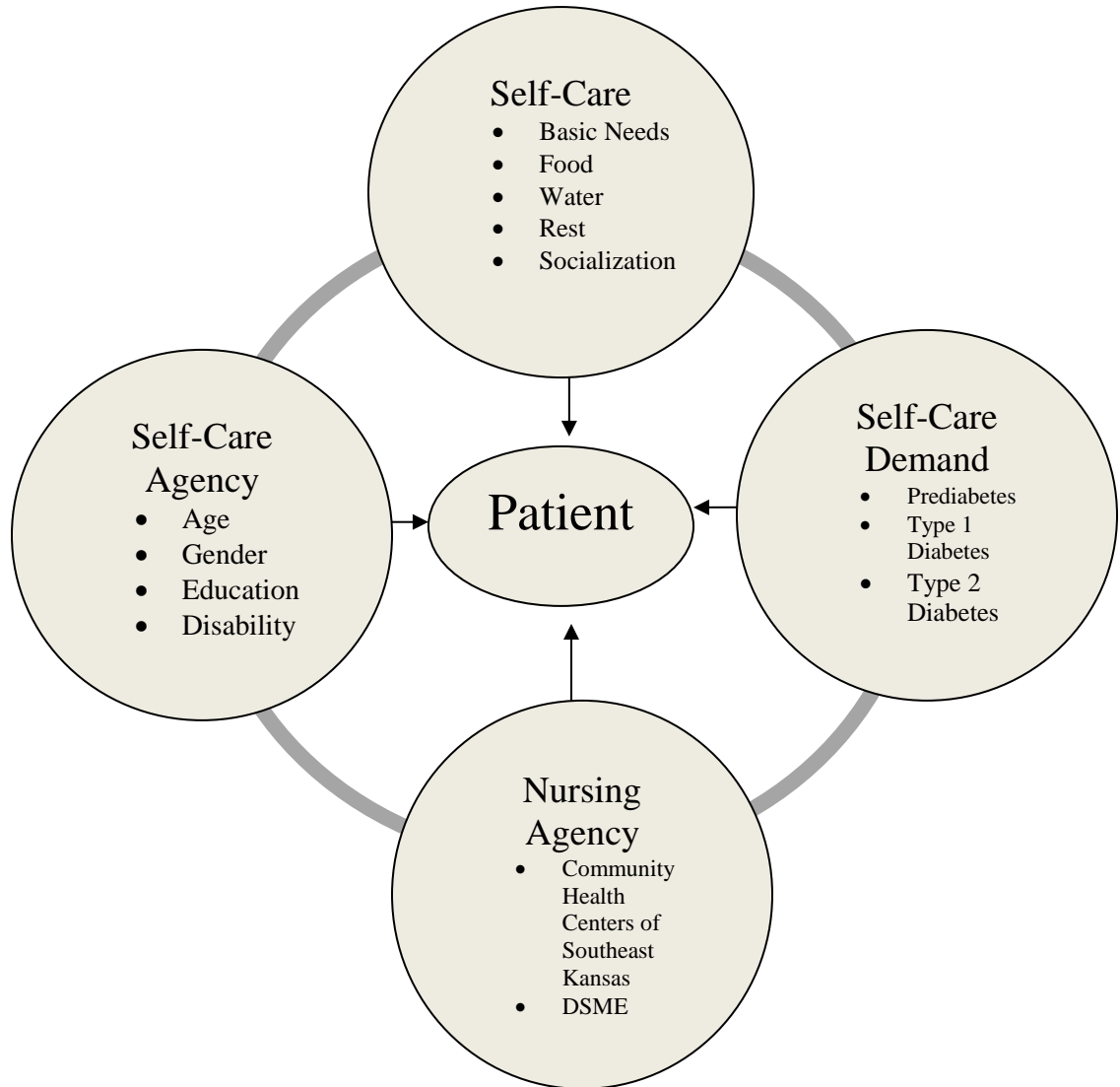
Theoretical Framework: Orem's Self-Care Deficit Nursing Theory

Orem's Self-Care Deficit Nursing Theory, developed by Dorothea Orem and based on the philosophy that patients wished to care for themselves, was chosen to guide this project (Shah, 2015). Three of the six major assumptions are people being self-reliant, people as distinct individuals, and that a person's knowledge of potential health problems is necessary for promoting self-care behaviors. Orem's theory is comprised of three interrelated parts: self-care, self-care deficit, and theory of nursing system. Self-care deficit specifies when nursing is necessary, which occurs when an adult is unable or limited in effective self-care. Five areas of helping are identified: acting/doing for others, guiding others, providing support, teaching, and promoting personal development (Peptrin, 2016).

The significance of this theory is to identify the right time with appropriate interventions to help patients achieve the best health outcome. Orem's self-care model demonstrates clear guidance of the concepts and their relationships. The model (Figure 1) illustrates the authors' interpretation of group DSME in relation to the patient, and the perceived program usefulness delivered through CHCSEK. The system is initiated when the patient's therapeutic self-care demand surpasses available self-care agency. In the

model below, the self-care demand is identified by demographic data such as age, gender, disability, and education. The self-care demand section depicts the patient's diagnosis of diabetes. The last two components self-care and nursing agency depict universal basic needs and the specific nursing site/DSME program provided. Orem's theory will guide this project to identify patient needs and assist with planning interventions accordingly. The theory will be utilized to guide and improve the current practice of diabetes education through evaluation of current health resources for individuals diagnosed with diabetes.

Figure 1 DSME and Nursing Intervention



Adapted from Dorthea Orem's Self-Care Deficit Theory Conceptual Model

Project Questions

Due to the multifactorial issues surrounding diabetes, several project questions have emerged to focus on evaluating the need for additional resources perceived by the patient for the delivery of effective diabetes education.

1. Does the administration of group diabetes self-management education influence patient knowledge of diabetes management?
2. Does the administration of group diabetes self-management education influence patient confidence to self-manage lifestyle choices?
3. What are the patient's demographics regarding age, race, gender, ethnicity, education, and employment?

Definition of Key Terms

Discussion of several key terms is mentioned throughout this paper that requires clarification to permit understanding.

- **Diabetes Self-Management Education Support (DSMES):** “DSMES is the ongoing process of facilitating the knowledge, skills, and ability necessary for prediabetes and diabetes self-care, as well as activities that assist a person in implementing and sustaining the behaviors needed to manage his or her condition on an ongoing basis, beyond or outside of formal self-management training” (Beck, et al., 2017, p. 1)
- **Primary Care Providers:** “A health care practitioner who sees people that have common medical problems. The person is most often a doctor. However, a PCP may be a physician assistant or a nurse practitioner” (A.D.A.M., 2018).

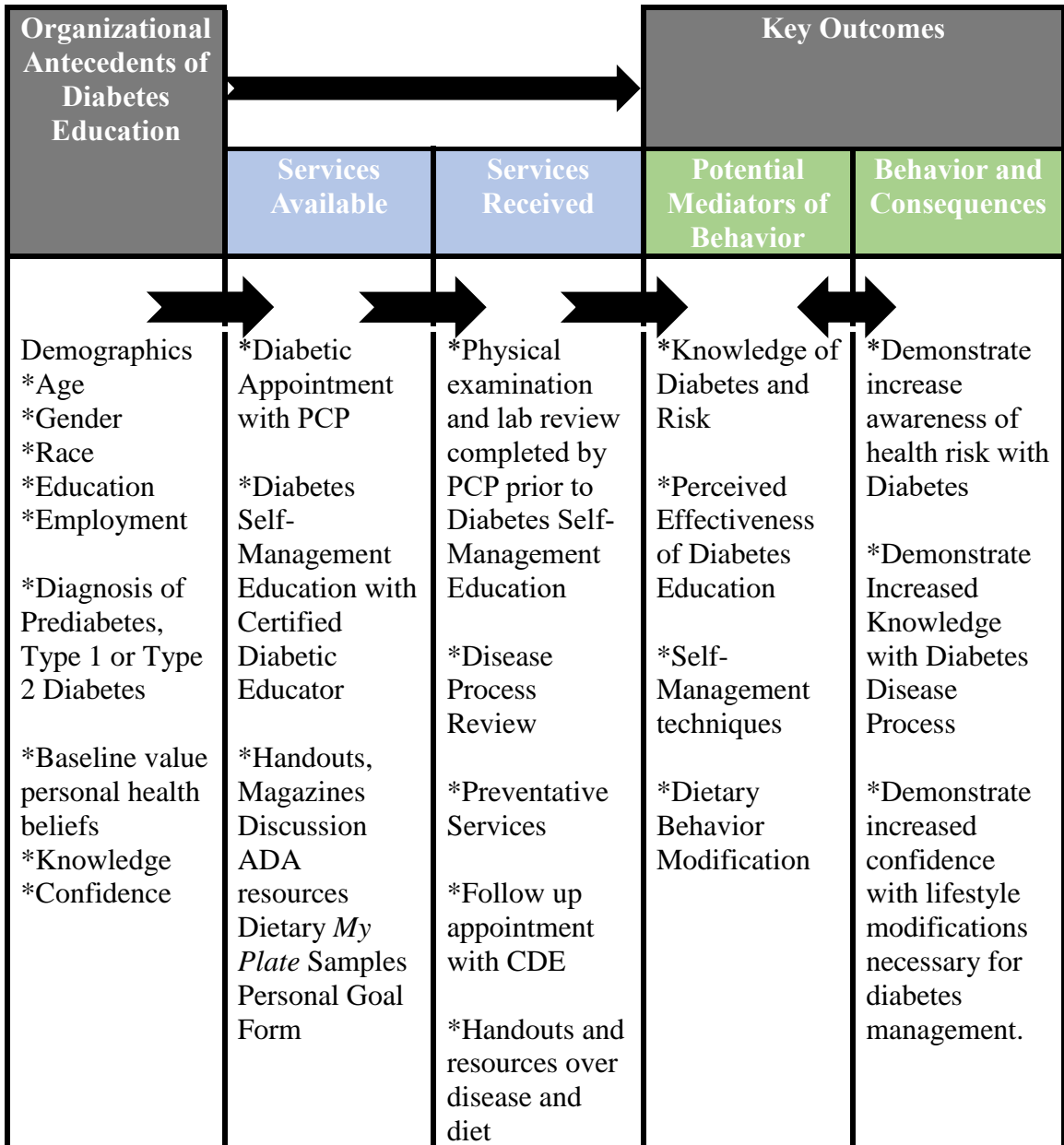
- **Certified Diabetic Educator:** “A health care professional with expertise in diabetes education who has met eligibility requirements and successfully completed a certification exam” (American Diabetes Association, 2018)
- **Prediabetes:** “Prediabetes means you have blood glucose, or blood sugar, levels that are higher than normal but not high enough to be called diabetes” (Medline Plus, 2016). “An A1C level between 5.7 and 6.4 percent is considered prediabetes” (Prediabetes, 2017, p. 1).
- **Type 1 Diabetes:** “an autoimmune condition. This means that the body’s immune system turns on itself; in this case, it attacks the beta cells of the pancreas. These are the cells that produce insulin. As a result, the pancreas produces very little, if any, insulin” (Campbell, 2016). An A1C of 6.5% or higher on two separate tests indicates diabetes. If type one is suspected additional testing for autoantibodies and ketones in urine will help differentiate between type one and type two diabetes (Type 1 diabetes, 2017, p. 1).
- **Type 2 Diabetes:** is not an autoimmune condition. Rather, it’s a chronic condition that affects how the body uses glucose. Type 2- diabetes generally results in part from insulin resistance, which means that the body has difficulty using insulin, along with abnormal insulin secretion. As a result, glucose builds up in the bloodstream” (Campbell, 2016). “An A1C level of 6.5 percent or higher on two separate tests indicates type 2 diabetes” (Prediabetes, 2017, p. 1).
- **Glycated hemoglobin (A1C) test:** Measures your average blood glucose level over a 2-3-month period by measuring the percent of sugar attached to oxygen-carrying protein hemoglobin in red blood cells (Type 1 diabetes, 2017).

Logic Model

The following diagram (Figure 2) is a visual diagram that illustrates the current diabetes education program design and expected outcomes. The diagram displays organizational antecedents of diabetes education and how current resources impact patient health outcomes. The initial stages of evaluating education include gathering input from key stakeholders such as local physicians, nurse practitioners, diabetic educators, and individuals diagnosed with prediabetes, type 1, or type 2 diabetes.

To evaluate diabetes education delivered in a primary care setting, surveys will be conducted in five local clinics and data will be collected over adults diagnosed with prediabetes, type 1, or type 2 diabetes. Data collection includes assessment of diabetes education delivered in group settings to evaluate patient perception of knowledge regarding diabetes and self-efficacy confidence necessary to effectively manage diabetes and prevent future complications. This diagram represents the expected outcomes when current education resources in CHCSEK rural clinics are utilized for the management of diabetes. The expected behavioral outcomes and consequences of this program are represented in the diagram below.

Figure 2 Logic Model



Summary

Diabetes is an increasing health concern in the U.S. The CDC recommends diabetes prevention and management programs to help reduce healthcare cost and poor health outcomes associated with unmanaged diabetes. Research has demonstrated the use of Diabetes Self-Management Education (DSME) as a useful tool to help patients with diabetes management. The number of certified diabetic educators limits the rural diabetic population in Southeast Kansas. Diabetes is continuing to increase at a steady rate worldwide and within the United States. Rural communities are unevenly distributed throughout the United States with nearly 25% of the population living in rural areas (Ross, Benavides-Vaello, Schumann, & Haberman, 2013) which adversely impacts communities through misdistribution of health care providers, health care specialties, and resources.

Lack of finances impacts the ability to provide necessary services to those individuals living in rural communities. Rural residents are more likely to be poor and living below the poverty level. Crawford County has 22.3% of all people living in poverty (Census Bureau, 2018). Diabetes is a chronic illness with numerous health complications to multiple organ systems. Uncontrolled diabetes can lead to cardiovascular, kidney, eye, and skin damage. Diabetes management can be costly due to the multifactorial components (medication, adherence, diet, exercise, etc.) of maintaining good glycemic control.

Evaluation of current health resources and patient perceived health status is vital to implementing creative measures to provide resources to diabetic patients in Southeast Kansas rural communities. Investment into diabetes education will improve patient health

outcomes and reduce healthcare cost associated with complications of poor diabetes management.

CHAPTER II

Review of Literature

A review of literature over the use of Diabetes Self-Management Education (DSME) in people with prediabetes, type 1, or type 2 diabetes is necessary to assess implementation measures and health impact in rural communities. The purpose of this research is to examine DSME programs as valid tools to assist with the management of diabetes to help reduce its prevalence, incidence, and adverse events. An extensive search of the literature was conducted using the following databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL) complete, CDC, MEDLINE, and PubMed. Key terms used to identify potential articles included diabetes education, diabetes guidelines, certified diabetetic education, type 1 diabetes management, and diabetes self-management education.

Diabetes mellitus (DM) is a complex set of related diseases that affect how the body regulates sugar (glucose) in the blood. The standard physiologic response of the liver is to convert food into glucose. The pancreas secretes insulin which allows glucose to be utilized as fuel for the body (Anees et al., 2013). Diabetes disrupts this standard physiologic response through several mechanisms. Diabetes is classified into two main types: Type 1, Type 2. Prediabetes is a disorder that precedes the development of Type 2 diabetes.

Complications of Diabetes

The economic burden of diagnosed diabetes in 2017 was 327 billion dollars in healthcare resources. The American Diabetes Association (ADA) (2017) statement reports the top five chronic complications of diabetes expenditures as peripheral vascular disease (39%), neurological (36%), renal (29%), and cardiovascular (27%) and other (27%) health-related complications.

Diabetes is linked throughout the literature with several complications including cardiovascular disease (CVD), peripheral vascular disease (PVD), retinopathy, and kidney disease (The American Journal of Managed Care, 2017). Complications of CVD and PVD have been associated with 60% prevalence of nontraumatic amputations. In 2011 diabetes was identified as the primary cause of kidney failure with 44% accounting for all new cases (The American Journal of Managed Care, 2017). Diabetes can cause hardening and narrowing of blood vessels of the legs and feet and nerve damage (ADA, 2018). Neuropathic changes can decrease a persons ability to sense pain, heat, and cold.

This loss of feeling can predispose diabetic patients to an unidentified foot or leg injuries. The poor circulation from vascular changes can impede the healing process from minor injuries. The American Diabetes Association (2018), recommends that people with diabetes take care of feet by use of proper footwear and daily inspection to prevent complications leading to amputation.

Yang et al., (2016) researched self-management behaviors, diabetes knowledge, health beliefs, social support, and treatment adherence in patients with diabetic retinopathy. The results showed the following factors to have a direct impact on diabetes-self management: health beliefs, treatment adherence, and length of diabetes

diagnosis. This study utilized a variety of measurement tools assessing diabetes knowledge via the Diabetes Knowledge Questionnaire, health beliefs via the Diabetes Health Belief Questionnaire, treatment adherence via a 20-item questionnaire, social support via Multidimensional Scale of Perceived Social Support, and self-management via the modified Type 2 Diabetes Self-Care Scale. Knowledge over diabetes was found to indirectly influence diabetes self-management through health beliefs. Social support among DR patients was found to have a direct impact ($\beta=0.35$, $p<0.01$) and an indirect influence on self-management, through treatment adherence ($\beta=0.77$, $p<0.01$). Improving health education can positively impact diabetes-self management.

Standards of Medical Care in Diabetes

The American Diabetes Association (ADA) (2018) published abridged standards of medical care in diabetes for primary care providers. The standards are comprised of the most current evidence-based practice recommendations for diabetes management. The position statement identifies five recommendations regarding diabetes self-management education. The first recommendation is that all people with diabetes should participate in a diabetes self-management education program. The second recommendation identifies four critical times necessary for patient referral: at the time of diagnosis, annually, during complications, and when transitions in care occur. The third recommendation discusses the facilitation of appropriate evaluation of health status, clinical outcomes, and quality of life and should be measured as part of routine care. The fourth recommendation states that DSME should be patient-centered and given in group or individual settings. The last recommendation reports that DSME can improve patient outcomes and reduce healthcare costs. Historically, DSME was comprised of formal

programs that included patients and family members to participate in an outpatient hospital or health facility. Receiving DSME in a convenient settings such as health centers and pharmacies have been shown to increase access (Powers et al., 2015).

The American Association of Diabetes Educators (AADE) (2014) provides an evidence-based framework of seven self-care behaviors essential for successful diabetes self-management: healthy eating, being active, monitoring, taking medications, problem-solving, healthy coping and reducing risks. The AADE7 provides a common framework for representing health and diabetes self-management. The AADE7 Self-Care Behavior structure has been utilized in several studies as a universal measurement of diabetes educators and DSME. The process incorporates immediate, intermediate, post-intermediate, and long-term behavior goals of DSME outcomes. The immediate goal of learning new knowledge, skills, and barriers influence the expected behavior change. The AADE7 self-care behaviors are the expected core outcome measures. The post-intermediate clinical improvement includes A1C, lipids, blood pressure, and body mass index. The long-term improved health status impacts perceived health status, quality of life, and healthcare costs (AADE, 2014).

Prediabetes Recommendations

Prediabetes is a condition where the body has higher than normal blood sugar levels, but not high enough to diagnose as type 2 diabetes (CDC, 2018). A HgbA1c of 5.7% to 6.4% or higher, fasting plasma glucose of 100-125mg/dL, or an OGTT 2hour blood glucose of 140mg/dL-199mg/dL confirms diagnosis of prediabetes (Romesh, 2018). Groups of people predisposed to prediabetes include African Americans, Hispanic/Latino Americans, American Indians, Pacific Islanders, and Asian Americans.

Additional risk factors include having a family history of type 2 diabetes, gestational diabetes, being 45 years or older, being overweight, or having polycystic ovary syndrome (CDC, 2018). Prediabetes increases the risk of developing Type 2 diabetes by up to 58% and 71% for individuals 60 or older (CDC, 2018). The CDC (2018) reports more than 84 million adults in the US are diagnosed with prediabetes. Early intervention and education courses are aimed at preventing the transition between prediabetes and type 2 diabetes, as well as providing support for self-management. The current education programs focus on reducing weight through dietary and physical activity interventions. The CDC (2018) identifies several national efforts to reduce the number of individuals diagnosed with type 2 diabetes (DSME) programs, as well as early prevention programs for individuals diagnosed with prediabetes such as the diabetes prevention program (DPP).

Preventing type 2 diabetes is aimed at weight loss. Weight loss and regular physical exercise can significantly lower the risk of developing type 2 diabetes. The CDC-led National Diabetes Prevention Program was developed specifically to prevent the progression from prediabetes to type 2 diabetes. The program is designed to aid lifestyle modifications and provide support through goals and challenges (CDC, 2018). The research study led by the National Institutes of Health demonstrated a 58% reduction in the chance of developing type 2 diabetes through a lifestyle change program that incorporated 150 minutes of moderate physical activity per week (Albright, 2012). The CDC and Community Preventative Services Task Force commissioned a review of DPP programs that analyzed 53 studies and 66 programs through February 2015. The analysis found that diabetes incidence decreased by 41% (95% confidence interval [CI]: 34% to 48%) through diet and exercise when compared to usual care (Balk et al., 2015). The

American Diabetes Association (2017) reports evidence of obesity management through a weight loss of $\geq 7\%$ is optimal for delaying progression from prediabetes to type 2 diabetes.

Type 2 Diabetes Recommendations

The CDC (2018) reports over 30 million American having diabetes with up to 95% having type 2 diabetes. Type 2 diabetes is a mix of genetics and environmental factors. A major contributor to the development of type 2 diabetes is increased weight. Individuals who are overweight or obese have extra pressure on the body's ability to utilize insulin for adequate glycemic control. The cornerstone of diabetes management remains lifestyle changes. The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) recommend management of diabetes by following a low calorie, lower saturated/trans-fat, low sugar, and low salt diet. Additional recommendations for increased physical activity, taking medications appropriately, and checking blood glucose levels are emphasized for maintaining healthy outcomes.

Individuals diagnosed with diabetes are recommended to participate in a diabetes self-management program (ADA, 2017). DSME is a useful tool that can be delivered in any setting. The literature supports DSME as a tool for decreasing healthcare cost. Wooley and Kinner (2016) conducted a study to compare perceived self-management practices of adult type 2 diabetic patients after completing an ADA certified self-management education (DSME) program with an unstructured, individualized nurse practitioner-led DSME. The study reported research evidence of 38.1% increase in readmission hospital rates for individuals who received no DSME (Wooley & Kinner, 2016). However, the study determined there was no statistical difference between the

formal ADA structured education and informal education samples. The study demonstrated the effectiveness of the DSME tool regardless of delivery setting.

DSME is defined as an ongoing process to facilitate knowledge and skills necessary for prediabetes and diabetes self-care. Delivery of DSME can be conducted in a variety of settings. Dehkordi, Mardanian, and Samereh (2017) evaluated DSME experience of people with diabetes. The study applied a descriptive phenomenological approach and evaluated DSME methods of instruction, learning environment, atmosphere, usefulness, and content. The researchers recommended health care providers reconsider their approach to DSME delivery to enhance participation. Diabetes self-management programs are designed to provide tools and support for optimal glycemic control.

The CDC (2018) reports a total of 62% of nonmetropolitan counties with no DSME program in 2016. The prevalence and incidence of diabetes were notably higher in nonmetropolitan counties with no DSME versus counties with at least one DSME. The CDC (2018) reports difficulty with expanding DSME programs in rural communities due to difficulty recruiting healthcare professionals able to meet the standards of DSME program recognition.

Type 1 Diabetes

Type 1 diabetes is an autoimmune disorder that develops due to genetic factors causing the pancreas to produce insufficient amounts of insulin. The underproduction of insulin causes glucose to build in the blood and starve the cells in the body. The resulting hyperglycemia can lead to a coma and ultimately death (Anees et al., 2013).

Management skills can help people with type 1 diabetes attain better glycemic control and reduce health complications (Gonder-Frederick, 2014). Areas of education needed for optimal type 1 diabetes management include caloric and nutritional requirements, daily servings, effects of macronutrients (carbohydrate, protein, and fat) on blood glucose, education on food label interpretation, meal planning and preparation, and appropriate snack and drink choice for hypoglycemic events (Gonder-Frederick, 2014).

Healthy Behavior Measurement Instruments

The Health Belief Model (HBM) is a theoretical model used to guide health promotion and disease prevention. The model defines several key influences regarding health behaviors (Bayat et al., 2013). The model defines influence on health behaviors, perceived susceptibility, perceived severity, perceived benefits and barriers, cues to action, and self-efficacy. How individuals perceive illness affects the probability of initiating action. Studies indicate theory-based educational programs can have positive results.

The HBM has been utilized in several studies examining the effects of HBM-based educational interventions versus no-HBM programs (Bayat et al., 2013). A study conducted in randomly selected hospitals in Tehran University of Medical Sciences examined effects of the extended HBM on self-efficacy of patients with type 2 diabetes and found an increase in perceived susceptibility, severity, benefits and self-efficacy (Bayat et al., 2013). Additionally, a decrease in the score of perceived barriers after the implementation of the educational program was noted. Jones, Smith, and Llewellyn (2014) published a systematic review evaluating the effectiveness of HBM interventions

in improving adherence. This review identified six studies using the HBM in its entirety and found intervention success to be unrelated to the health belief model construct.

The Adherence and Self-Management Monitoring Tool (ASMMT) is a 16-item questionnaire containing closed- and open-ended questions focusing on self-management of blood glucose monitoring. The tool was developed in Nigeria (Yusuff, Obe, & Joseph, 2008). The objective of the study was to describe patterns with anti-diabetic drug prescribing, glycemic control, medication adherence, and diabetes self-management practices. However, the limited instrument characteristics make it difficult to check the appropriateness of the ASMMT as a self-management tool (Lu, Xu, Xhao, & Han, 2015).

The Diabetes Self-Management Assessment Report Tool (D-SMART) is a 49-item 4-5-point Likert-type questionnaire. The D-SMART is an instrument within the American Association of Diabetes Educators (AADE) outcome system. The instrument allows educators to assess, facilitate, and track behavior change within the DSME program (Charron-Prochownik et al., 2007). The D-SMART was integrated into electronic format and telephone via five sites in the Pittsburg Regional Initiative for Diabetes Education (PRIDE) network. Data was collected over 290 patients with diabetes with 76% of the group reporting easy to understand questions and 80% required no assistance completing. The D-SMART was found to enhance communication between clinician and patient as a useful assessment method for diabetes educators (Charron-Prochownik et al., 2007).

The Robert Wood Johnson Foundation (RWJF) offers numerous program materials for diabetes self-management education. The Diabetes Initiative was funded by a grant from the RWJF that involved a 30-month multi-site initiative on improving

diabetes self-management. Data sources included clinical records, key informant interviews, and participant surveys which provided information over perceived support and self-management behaviors (Garrett, 2012). The use of self-care instruments provides a starting point for researchers to examine deficiencies experienced by the patient in order to strengthen the delivery of diabetes management education.

Barriers of Diabetes Self-Management

Several factors have been identified to have a significant impact on the non-attendance of DSME. Schwennesen, Henriksen, and Willaing (2015) explored themes among Type 2 diabetic patients explaining non-attendance to DSME programs. The qualitative study completed 15 semi-structured interviews of patients who were referred to DSME but never attended. The DSME program evaluation was conducted in a hospital setting in southern Denmark. The interviews were conducted through phone calls in the spring of 2012. The informational focus was directed to why patients had not attended self-management education. Two key themes to emerge from the study included inappropriate timing as a major factor to non-attendance and perceived lack of benefit (Schwennesen et al., 2015). One individual barrier identified was participants did not feel the program would be beneficial because they were experiencing no daily issues. Overall, all the explorative study identified both organization and individual factors explaining the non-attendance of DSME in type 2 diabetes patients (Schwennesen et al., 2015).

Location has been identified as a barrier to the attendance of self-management education. One study evaluated the feasibility of bringing DSME to the patient. Lavelle et al., (2016) evaluated the use of DSME delivery through home visits. The pilot project evaluated a cohort of adult diabetic patients and completed home visits of 19 participants.

The cohort included 12 females and seven males between the ages of 40 and 90 years of age. Individuals were found to have 12% reduction in A1C level and 12% reduction of serum glucose. The mean BMI reduction rate was 2% (Lavelle et al., 2016). The results suggest education with in-home reinforcement can improve self-management of diabetes. Several benefits from in-home education included correcting home health monitoring, identification of barriers, and increased self-management confidence. One drawback from this method is time and a limited number of diabetic educators.

Summary

This chapter focused on evidence-based literature relating to self-management of diabetes through group led education programs such as DSME. The reviewed literature identifies self-management education as an important clinical tool to management and prevention of diabetes. Additional literature indicates proper management of diabetes and lifestyle modification can improve healthcare cost and reduce complications. Research suggests instructors perform an evaluation of education to evaluate DSME curricula for improving the delivery of effective self-management education.

CHAPTER III

Project Design

The purpose of this project was to assess the current knowledge of diabetes and lifestyle modifications utilized among individuals with prediabetes, type 1, or type 2 diabetes who received DSME through Community Health Clinics. A descriptive research design was utilized to measure health knowledge and self-efficacy of disease management after DSME education.

Methods

The study utilized a one-group pre-test/posttest design on individuals with prediabetes, type 1, or type 2 diabetes. The chosen method of data collection was selected to yield information comparing the difference between pre-test and post-test scores after receiving group diabetes education. The participants were invited to participate in the pre-and posttest using the adapted Robert Woods Johnson Foundation questionnaire. A pre-test survey was administered to diabetic patients prior to receiving group education, and a follow-up posttest was given upon completion of the intervention. The questionnaires were used to assess the level of knowledge and perceived health management confidence of prediabetes, type 1, or type 2 diabetes. The results of the study will be utilized to improve group led DSME programs within the rural community. Rural communities lack resources and providers capable of delivering diabetes self-

management education. Incorporating DSME into group sessions could potentially allow hospitals or clinics to adopt this model to meet the needs of diabetic patients served without exhausting limited resources.

The three main methods for descriptive research include observational, case-study, and survey method (Creswell, 2013). A descriptive quantitative design was chosen to guide this study to obtain quantifiable data for statistical analysis.

Project Site and Population

The surveys were administered at five different Community Health center locations was prepared by this author and agreed upon by the DNP Scholarly Project Committee. A convenience sampling of patients was utilized and determined by the number of participants at each location. The education was provided by a CDE. Convenience sampling was selected because of the accessibility to diabetic patients receiving the group led education. Participants were included in the study if the patient is between the ages of 18-65, a diagnosis of prediabetes, type 1, or type 2 diabetes. Participants who were non-English speaking, pregnant, mentally disabled, or unable to manage disease independently were excluded from the study.

Participation in the group education sessions was voluntary. Individuals were asked to participate the same day, prior to the initiation of the group education. Consent was obtained on written consent forms and provided prior to initiating the education session. An adapted RWJF survey was provided post education session.

Data Collection

Measurement Instruments. The survey questionnaire tool was adopted from the Robert Wood Johnson Foundation diabetes initiative program. The Diabetes Project Participation Questionnaire has been endorsed and accepted by experts at the RWJF as part of the diabetes initiative (DI). The DI was a national program from 2002-2009 that focused on recognizing feasible and sustainable methods for promoting diabetes self-management in primary care and community settings (Fisher et al., 2007). The diabetes initiative site was archived in 2009 and is a repository for program models, tools, and resources.

The initiative identified key roles of community health workers in diabetes care: instruction in self-management and problem-solving skills, emotional support, and effective communication. The surveys were distributed to participants after reviewing the project and discussion of risk/benefits. The purpose of this study was to evaluate a multicomponent group diabetes self-management education program among adults in the SEK area. The study assessed current knowledge regarding diabetes among the patient and assessed the perceived ability to confidently self-manage lifestyle choices. The surveys were compared pre and post DSME session and analyzed to evaluate the relationship between patient knowledge and confidence level of diabetes management. The pretest surveys were collected in a manila envelope, and the posttest surveys were administered after the intervention and collected in a separately marked manila envelope. Once collected, only the project leader and site supervisor had access to the surveys. Questionnaires were coded and stored in an encrypted password file. The original paper

copies are held on-site at CHCSEK of Pittsburg in a locked cabinet for two years and then will be destroyed.

Ethical Considerations/Protection of Human Subjects

The subject participants provided consent prior to involvement of the study. The benefits and risks of the study were reviewed with each participant prior to obtaining consent. The study did not include any identifiable data. The vulnerable populations of pregnant women, minors, and mentally disabled individuals were excluded. Each participant was assigned a random number. The researcher upheld the three basic principles of human subject protection: respect for persons, beneficence, and justice. Data collection occurred at the time of intervention. The student obtained IRB approval before contacting participants and data collection.

Data Analysis

Reliability and Validity. The RWJF diabetes initiative program was conducted over 30 months and included multi-site Initiative to improve diabetes self-management. Surveys were utilized to assess individualized assessment, collaborative goal setting, community resources, follow up support, and skill enhancement. The surveys included questions over sociodemographic data, health status, and self-management behaviors and measured self-management behaviors. The project participant pre and posttest are available under individual assessment on the diabetes initiative website. The diabetes project pre-participation questionnaire consists of 43 questions total, 10 demographic questions, and 33 health behavior and diabetes knowledge questions. This study utilized the adapted pre-participation questionnaire as a pre and post-test. The adapted study includes six demographic questions and 24 health behavior and diabetes knowledge

questions. Demographic questions included age, gender, zip code, race, education, and employment status. Assessment of demographics in relation to the response of knowledge and confidence questions were evaluated. Participants were asked to self-assess diabetes knowledge over nutrition, blood glucose testing interventions in relation to high-low, effects of medications on diabetes, stress, and preventative cares on a five-point Likert scale. Additionally, participants self-assessed confidence on a five-point Likert scale. Individuals were asked to assess the level of confidence over diabetes self-care behaviors, see appendices A for adapted pre and post participant survey. Throughout the literature reviews, no studies have examined the utilization of the pre and post-surveys exclusively.

Analytical Methods. Descriptive statistics were used to describe demographic data: number of subjects, gender, age, diabetes knowledge, and confidence. A paired t-test for summative average was used via SPSS software to compare average scores of survey responses pre and post diabetes education.

Timeline

Data was collected between December 1, 2018, and February 28, 2019. The author collected data from group sessions held at each of the five clinic locations in Southeast Kansas: Pittsburg, Iola, Coffeyville which includes Independence patients, Baxter Springs including Columbus patients, and Parsons in the process of this study. No identifying factors were included in the reporting of the data, and no compensation was given to participants.

Budget

There was no cost incurred for the creation and distribution of the surveys. The student utilized resources from the Pittsburg State University Irene Ransom Bradley School of Nursing.

Strengths and Weakness of the Study

Strengths of the study are pretest acting as a control which compares the same sample and compares status pretest-posttest scores to determine whether assumed prerequisites have been achieved. Weaknesses of the study include human error and no control group which can undermine internal validity. When using the same pretest/posttest, it will be difficult to discern whether the sample will absorb the knowledge based on the pretest. Additional weaknesses are small sample sizes, undetermined education level, and unknown racial/gender factors of the groups to be studied.

Summary

A descriptive quantitative research design was used in this project through convenience sampling from five CHCSEK locations of prediabetic, type 1, or type 2 diabetic patients who meet the inclusion. Descriptive statistics were evaluated upon completion of the project. Review of data analysis was used to determine whether this population perceives group diabetes self-management education beneficial for the management of diabetes and increasing diabetes knowledge. Data from the Diabetes Project Participation Questionnaire were analyzed for the extent to which the DSME program increased participant's perception of disease knowledge and confidence with self-management. Evaluation of the group DSME program occurred utilizing a one group pretest-posttest method.

CHAPTER IV

Evaluation Results

Purpose

The purpose of this study was to analyze data on a sample of individuals with prediabetes, type 1 or type 2 diabetes to evaluate perceived knowledge and confidence before and after they have completed a DSME program. A pre-test and posttest design were utilized to evaluate a correlation between patient perception of diabetes knowledge and self-management confidence prior to attending the DSME. The project questions evaluated include:

1. Does the administration of group diabetes self-management education influence patient knowledge of diabetes management?
2. Does the administration of group diabetes self-management education influence patient confidence to self-manage lifestyle choices?
3. What are the patient's demographics regarding age, race, gender, ethnicity, education, and employment?

Sample

The demographic characteristics of the participant sample include 31 individuals who have a diagnosis of prediabetes, type 1 or type 2 diabetes. Upon approval of the Pittsburg State University research committee, Community Health Centers of Southeast

Kansas, and IRB, data was collected between December 1, 2018, and February 28, 2019. Inclusion criteria included patients between the ages of 18 and 65 who have a diagnosis of prediabetes, type 1, or type 2 diabetes. Participants who were non-English speaking, pregnant, mentally disabled, or unable to manage disease independently were excluded from the study.

Demographic data was divided into age, gender, race, education, and employment. The following chapter will review data tables divided into pre and post knowledge, pre and post confidence, individual survey question responses, and demographics. Data analysis was performed by finding the frequency of each measure.

Analysis of Project Questions

The CDC recommends diabetes prevention and management programs to help reduce healthcare cost and poor health outcomes associated with unmanaged diabetes. Research has demonstrated Diabetes Self-Management Education (DSME) as an effective tool to help patients with diabetes management. There were three project questions addressed in this project. Each question will be reviewed individually to ensure it is answered completely. The summative mean was identified as the most valuable determining factor in analyzing data.

Research Question One. Does the administration of group diabetes self-management education influence patient knowledge of diabetes management?

The correlation between DSME pretest and posttest was answered using data collected on questions nine through 21. The participants were provided a Likert rating scale presenting a statement with a one to five scores between very poor and very good. The questions were identical for both pretest and posttest. Participants were asked to rate

current knowledge of diabetes care, glycemic control, preventative care, nutritional management, and ways to cope with stress. Individual questions over diabetes knowledge were examined pretest (Table 1) and posttest (Table 2). An overall summative average of participant perception of knowledge pre and post DSME session was compared (Table 3).

Table 1. Pretest Average of Response to Individual Items on Knowledge

	Mean	Std. Deviation
9. Overall diabetes care	2.94	1.031
10. Ways to cope with stress	3.23	1.055
11. meal planning for blood sugar control	2.71	1.101
12. how diet affect blood sugar levels	3.06	1.063
13. how physical activity affects blood sugar levels	3.16	1.003
14. how medicine affects blood sugar levels	3.16	1.003
15. prevention of HIGH blood sugars	3.19	1.167
16. treatment of HIGH blood sugars	3.19	1.078
17. prevention of LOW blood sugars	3.13	1.088
18. treatment of LOW blood sugars	3.13	1.042
19. prevention of long-term health problems with diabetes	3.10	1.062
20. taking care of your feet	3.39	1.283
21. benefits of improving your blood sugar control	3.26	1.125
Total Pretest Knowledge Summative Average	3.1288	.90231

Note. For observed means, 1=*very poor*; 2=*poor*; 3=*fair*; 4=*good*; 5=*very good*.

Using a five-point Likert scale from very poor to very good participants respond to each individual item was analyzed. Responses were evaluated by the following scores: Very poor (0-1.49), Poor (1.5-2.49), Fair (2.5-3.49), Good (3.5-4.49), and Very Good (4.5 and above). All the mean individual responses fell between 2.5 and 3.49 or fair knowledge prior to participation in DSME education.

Table 2. Posttest Average of Response to Individual Items on Knowledge

	Mean	Std. Deviation
9. Overall diabetes care	4.16	.735
10. Ways to cope with stress	3.65	.985
11. meal planning for blood sugar control	4.32	.748
12. how diet affect blood sugar levels	4.35	.755
13. how physical activity affects blood sugar levels	4.29	.824
14. how medicine affects blood sugar levels	4.45	.568
15. prevention of HIGH blood sugars	4.42	.720
16. treatment of HIGH blood sugars	4.35	.709
17. prevention of LOW blood sugars	4.45	.624
18. treatment of LOW blood sugars	4.50	.630
19. prevention of long-term health problems with diabetes	4.35	.755
20. taking care of your feet	4.58	.564
21. benefits of improving your blood sugar control	4.61	.558
Total Posttest Knowledge Summative Average	4.3445	.56351

Note. For observed means, 1=*very poor*; 2=*poor*; 3=*fair*; 4=*good*; 5=*very good*.

Using a five-point Likert scale from very poor to very good participants response to each individual item was analyzed. Responses were evaluated by the following scores: Very poor (0-1.49), Poor (1.5-2.49), Fair (2.5-3.49), Good (3.5-4.49), and Very Good (4.5 and above). Questions 11 through 17 and 19 mean individual responses fell between 3.5 and 4.49 or having a Good (3.5-4.49) perception of knowledge after participating in DSME education. On questions 18, 20 and 21, the mean participant response indicates a very good (4.5 and above) knowledge after the DSME session.

Table 3. Summative Average of Diabetes Knowledge

	Mean	N	Std. Deviation
Pre-Summative Average of Diabetes Knowledge	3.1288	31	.90231
Post-Summative Average of Diabetes Knowledge	4.3445	31	.56351

Note. For observed means, 1=*very poor*; 2=*poor*; 3=*fair*; 4=*good*; 5=*very good*.

Using the five-point Likert scale from very poor to very good participants summative average pretest and posttest were analyzed. Responses were evaluated by the following scores: Very poor (0-1.49), Poor (1.5-2.49), Fair (2.5-3.49), Good (3.5-4.49), and Very Good (4.5 and above). The pre-summative mean (3.1) indicates participants had a fair perception of diabetes knowledge of questions nine-21 prior to DSME. The post-summative mean (4.3) shows participants had an increase of (1.2) points indicating participants had a good perception of diabetes knowledge after DSME.

Research Question Two. Does the administration of group diabetes self-management education influence patient confidence to self-manage lifestyle choices?

The participant response to questions regarding confidence analyzed using data collected on questions 22 through 29 on both the pretest and posttest. The participants were provided a Likert rating scale presenting a statement with a one to five scores between very poor and very good. The questions were identical for both pretest and posttest. Participants were asked to rate the current perception of confidence managing condition, stress, diet choices, exercising, health maintenance, and lifestyle choices. Individual questions over diabetes knowledge were examined pretest (Table 4) and

posttest (Table 5). An overall summative average of participant perception of confidence pre and post DSME session was compared (Table 6).

Table 4. Pretest Average of Response to Individual Items on Confidence

	Mean	Std. Deviation
22. doing all the things necessary to manage your condition on a regular basis	2.74	.999
23. keeping stress and worry from affecting the things you want to do	2.74	1.210
24. following your meal plan when you must fix or share food with other people who do not have diabetes	2.57	1.382
25. choosing healthy foods to eat when you are hungry	2.74	1.210
26. exercising at least 15-30 minutes a day, 4-5 most days of the week	2.52	1.151
27. knowing what to do when your blood sugar level goes higher or lower than it should be	2.87	1.204
28. judging when the changes in your health mean you should visit the doctor	3.19	1.167
29. controlling your diabetes so that it does not interfere with the things you want to do.	3.00	1.155
Pretest Summative Average Confidence	2.7990	.97631

Note. For observed means, 1=*very poor*; 2=*poor*; 3=*fair*; 4=*good*; 5=*very good*.

Using a five-point Likert scale from very poor to very good participants response to each individual item on confidence was analyzed. Responses were evaluated by the following scores: Very poor (0-1.49), Poor (1.5-2.49), Fair (2.5-3.49), Good (3.5-4.49), and Very Good (4.5 and above). All the mean individual responses fell between 2.5 and 3.49 or fair perception of confidently managing diabetes prior to participation in DSME education.

Table 5. Posttest Average of Response to Individual Items on Confidence

	Mean	Std. Deviation
22. doing all the things necessary to manage your condition on a regular basis	4.06	.772
23. keeping stress and worry from affecting the things you want to do	3.84	.860
24. following your meal plan when you must fix or share food with other people who do not have diabetes	4.06	.929
25. choosing healthy foods to eat when you are hungry	4.26	.930
26. exercising at least 15-30 minutes a day, 4-5 most days of the week	4.06	.814
27. knowing what to do when your blood sugar level goes higher or lower than it should be	4.32	.791
28. judging when the changes in your health mean you should visit the doctor	4.35	.839
29. controlling your diabetes so that it does not interfere with the things you want to do.	4.33	.711
Posttest Summative Average Confidence	4.1636	.68610

Note. For observed means, 1=*very poor*; 2=*poor*; 3=*fair*; 4=*good*; 5=*very good*.

Using a five-point Likert scale from very poor to very good participants response to each individual item on confidence was analyzed. Responses were evaluated by the following scores: Very poor (0-1.49), Poor (1.5-2.49), Fair (2.5-3.49), Good (3.5-4.49), and Very Good (4.5 and above). All the mean individual responses fell between 3.5 and 4.49 or having a good (3.5-4.49) perception of confidently managing diabetes after participating in DSME education.

Table 6. Summative Average of Diabetes Confidence

	Mean	N	Std. Deviation
Pre-Summative Average of Diabetes Confidence	2.7990	31	.97631
Post-Summative Average of Diabetes Confidence	4.1636	31	.68610

Note. For observed means, 1=*very poor*; 2=*poor*; 3=*fair*; 4=*good*; 5=*very good*.

Using the five-point Likert scale from very poor to very good participants summative average pretest and posttest were analyzed on questions 22-29 regarding confidence with managing diabetes. Responses were evaluated by the following scores: Very poor (0-1.49), Poor (1.5-2.49), Fair (2.5-3.49), Good (3.5-4.49), and Very Good (4.5 and above). The pre-summative mean (2.7) indicates participants had a fair perception of confidently managing diabetes prior to DSME. The post-summative mean (4.1) shows participants had an increase of (1.4) points indicating participants had a good perception of confidence for managing diabetes after DSME.

Table 7. Paired Sample Statistics

		Mean Difference	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	Pre-Summative Avg Knowledge- Post-Summative Avg Knowledge	1.21567	.82816	8.173	30	.000
Pair 2	Pre-Summative Avg Confidence – Post- Summative Avg Confidence	1.36463	.85177	8.920	30	.000

Paired Samples t tests were calculated to see if there was a statistical difference between the pre and post-measures between the participant's perceived knowledge and confidence level. There was a statistical difference between the pre and post measure for their knowledge level (t=8.173, p=.000). They had an increase of 1.21 points on a five-point scale for their knowledge level. When the pre and post measure were compared

between the participant's confidence level, there also was a statistical difference ($t=8.92$, $p=.000$). The participant's self-reported confidence level rose 1.36 point on their post measure for confidence when compared with their premeasure.

Research Question Three. What are the patient's demographics regarding age, race, gender, ethnicity, education, and employment?

The participants' demographics were analyzed to obtain a greater understanding of the population served. The demographics were divided into age, gender, ethnicity, education, and employment — the following tables review participant responses to demographic data.

Table 8. Frequency and Percent of Participant Age

Age	Frequency (n=31)	Percent (%)
30-39	3	9.7
40-49	5	16.1
50 -59	14	45.2
60 and above	9	29.0
Total	31	100.0

Subjects were divided into four age groups between 18 and 65 years. Of the 31 participants, the majority fell into the 50-59 years age group (45.2%). Participants 60 years and above was the second highest age group (29.0%). The population of 30-39 was identified as the age group with the least participation (9.7%).

Table 9. Frequency and Percent of Participant Gender

Gender	Frequency	Percent
Males	15	48.4%
Females	15	48.4%
Not Answered	1	3.2%

The total number of participants was 31 individuals. There were 15 male subjects (48.4%), and 15 female subjects (48.4%). There was one missing participant response (3.2%).

Table 10. Frequency and Percent of Participant Race

Race	Frequency	Percent
White or Caucasian	31	100%
Black or African American	0	0%
Asian	0	0%
Native Hawaiian or other Pacific Islander	0	0%
American Indian or Alaska Native	0	0%
Other	0	0%

The participants were asked to identify as white or Caucasian, Black or African American, Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, and other. Of the 31 participants (100%) identified as white or Caucasian in race.

Table 11. Frequency and Percent of Participant Education

Education	Frequency	Percent
Grade School 1-8	1	3.2%
High School 9-12	15	48.4%
College	15	48.4%

Participant response to education level was evenly distributed between High-School 9-12 (48.4%) and College (48.4%). One respondent reported a Grade School 1-8 education level (3.2%).

Table 12. Frequency and Percent of Participant Employment Status

Employed	Frequency	Percent
Yes	11	35.5%
No	7	22.6%
Retired	15	16.1%
Disabled	8	25.8%

The largest group of participants reported current employment status (35.5%).

The second largest group reported disabled status (25.8%).

Table 13. Knowledge of Diabetes Status

Knowledge	Frequency	Percent
Yes	25	80.6%
No	5	16.1%
Missing	1	9.2%

Participants were asked, "do you know what type of diabetes you have?" The majority of subject's reports "yes" at (80.6%). The other (16.1%) responded "no" and (3.2%) did not respond to the question.

Table 14. Type of Diabetes

Diabetes Type	Frequency	Percent
Pre-Diabetes	1	3.2%
Type 1	2	6.5%
Type 2	24	77.4%
Missing	4	12.9%

Participants were categorized into three types pre-diabetes, type1, or type 2. Of the 31 participants (77.4%) reported type 2 diabetes. The second largest group (12.9%) did not answer the question. Only one participant (3.2%) fell into the pre-diabetes category, and two participants responded as type 1 diabetic (6.5%).

Table 15. Participation in Diabetes Program

Participation Diabetes Education	Frequency	Percent
Yes	6	19.4%
No	25	80.6%

Of the 31 participants (80.6%) had not attended diabetes education in the past year and (19.4%) responded "yes."

Summary

Data analysis was completed using IBM SPSS Statistics. Descriptive analysis of participants age, gender, race, education, and employment was evaluated for individuals with a diagnosis of prediabetes, type 1 or type 2 diabetes. A paired t-test was used to assess the summative average in participants pretest and posttest regarding diabetes knowledge and perceived confidence pre and post DSME. A total of 32 participants consented to participate in the study. One respondent pre and post survey was removed due to exceeded age of 72 years. The remaining participants completed a pretest and posttest survey evaluating diabetes knowledge and self-efficacy confidence of diabetes management prior to DSME and post DSME session.

Data frequency was completed on demographic data: age, gender, race, education, and employment. The largest group of participants were Caucasian (100%) and between the age of 50-59 (45.2%). The participant gender male to female was evenly distributed (48.4%) with one missing response (3.2%). Of the 31 participants, there was an even distribution between a high-school 9-12 and college education (48.4%). One responded reported having a grade school education 1-8 (3.2%). The largest group of participants reported they were currently employed (32.3%), seven responded they were not employed (22.6%), eight reported as disabled (25.8%), and five as retired (16.1%).

A paired t-test was run on a sample of 31 DSME participants to determine whether there was a statistically significant mean difference between pretest and posttest scores of diabetes knowledge and confidence before and after DSME. The pre-test mean score on diabetes knowledge was 3.1, and the post-test mean score on knowledge was 4.3, which is a mean gain of 1.2 (see Tables 3 and 7). A repeated-measures t-test found

this difference to be significant, $t(30)=8.17$, $p<0.001$. Together this suggest that the DSME may affect perceived diabetes knowledge level. Additionally, the pre-test mean score on diabetes confidence was 2.7, and the post-mean score on knowledge was 4.1, which is a mean gain of 1.3 (see Tables 6 and 7). A repeated-measures t-test found this difference to be significant, $t(30)=8.92$, $p<0.001$ suggesting DSME may affect perceived confidence for diabetes management. It can be concluded that the perceived knowledge and confidence were significantly higher upon completion of the DSME session.

CHAPTER V

Discussion

Purpose

The specific purpose of this project was to evaluate patient perception of diabetes knowledge and self-efficacy confidence with disease management before and after attending DSME. Evaluation of a DSME program is necessary to determine the patient perception of information received. With this data, changes to the DSME curriculum could be improved to meet current national standards.

Relationship of Outcomes to Research

Three research questions were examined in this project. Each question was answered thoroughly and completely. The first question “does the administration of group diabetes self-management education influence patient knowledge of diabetes management?” This question was answered by comparing pretest and posttest surveys evaluating questions nine through 21 on the instruments. Subjects were asked to rate current knowledge of diabetes on a five-point Likert-type scale, "very poor," "poor," "fair," "good," or "very good." Each category was coded using numerical data 1-5 starting at number one (very poor) to number five (very good).

The summative mean of the data collected for diabetes knowledge revealed an increase in participant response by 1.2 points and a standard deviation of 0.82. These

findings indicate that participants perceived more knowledge of diabetes after attending DSME. The standard deviation was low indicating less variability.

The second question “does the administration of group diabetes self-management education influence patient confidence to self-manage lifestyle choices?” This question was answered by comparing pretest and posttest surveys evaluating questions 22 through 29 on the instruments. Subjects were asked to rate confidence of diabetes management on a five-point Likert-type scale, “very poor”, “poor”, “fair”, “good”, or “very good”. Each category was coded using numerical data 1-5 starting at number one (very poor) to number five (very good).

The summative mean of the data collected for diabetes confidence revealed an increase in participant response by 1.3 points and a standard deviation of 0.85. These findings indicate that participants perceived more self-efficacy confidence after attending DSME. The standard deviation was low indicating less variability. Lastly, the third question “what are the patient’s demographics regarding age, race, gender, ethnicity, education, and employment?” was determined by descriptive statistics percentages and frequencies. Respondents were asked to identify with a specific age range “19-29”, “30-49”, “50’59”, and “60 and above”. Participants who identified in the 30-49 age range were asked to write actual age to further evaluate the number of participants between ages 30-39 and 40-49 (Appendix A). Data for gender was obtained via "yes" and "no" questions. The race was obtained by having participants identify within one of the following categories: white or Caucasian, Black or African American, Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, and other. Level of education was evaluated through three measures: grade school 1-8, high school 9-12,

and college. Finally, employment was evaluated by “yes”, “no”, “retired”, and “disabled”. All data was assigned a numerical value and entered into SPSS. Categorical data was applied to find the frequency and percentages of each measure.

The data analysis revealed the highest group of participants 45.2% were between the ages of 50-59 years and 100% was Caucasian. The male to female ration was evenly split 48.4% due to one missing response of 3.2%. The largest group of participants were employed at 35.5%. These results show the largest group of participants as middle-aged Caucasian adults. The American Diabetes Association (2018), reports African American’s, Mexican Americans, American Indians, Native Hawaiians, Pacific Islanders, and Asian Americans as having a higher risk for type 2 diabetes. The U.S census bureau 2017 statistics for Crawford County reports 91.6% of the population is white alone and 86.6% of the population is white alone, not Hispanic or Latino. Additionally, the education reported for Crawford County from 2013-2017 includes 90.3% of the population having a high school or higher education. The data indicates an accurate sample of the population.

The final three question on the survey instrument “do you know what type of diabetes you have”, “if yes, what type”, and “during the past year, have you participated in an education program about diabetes” were included to assess prior knowledge of diabetes diagnosis and education participation prior to attending the group led DSME session. The data analysis indicates 80.6% of the subjects knew what type of diabetes they were diagnosed with prior to attending class and 16.1% was not aware of their diagnosis. The largest group consisted of subjects diagnosed type 2 diabetics at 77.4%, and 12.9% chose not to answer. Lastly, of the 31 participants, 25 (80.6%) had not

attended diabetes education within the last year. The high response of participants regarding no knowledge of their diabetes diagnosis could indicate a break in communication between patient and primary care provider. Diabetes management is a complex system requiring modification in nutrition, physical activity, self-care behaviors, and medications. Barriers in communication on a provider level and a patient level could be explored to identify the relation between the lack of patient understanding regarding diabetes diagnosis.

Observations

General observations noted during the project include poor attendance rates. Several DSME sessions were scheduled to host five to nine participants, and frequently only one or two participants would attend. Through the 3.5-hour sessions, participants remained actively engaged which indicates an appropriate length of time to deliver diabetes education. The study instruments utilized were sufficient for this project. The pretest and posttest (Appendix A) incorporated the AADE evidence-based framework of seven self-care behaviors essential for successful diabetes self-management: healthy eating, being active, monitoring, taking medications, problem-solving, healthy coping and reducing risks.

The survey indicated increased knowledge and self-management confidence in all measures. The measure with the least increase on both knowledge and confidence involves “coping with stress” and “keeping stress and worry from interfering with things you want to do.” This indicates that all measures are being met, but curriculum involving stress and worry should be re-evaluated for future curriculum designs.

Evaluation of Theoretical Framework

The data from this research supports Dorthea Orem's Self-Care Deficit Theory of identifying the right time with appropriate interventions to help patients achieve the best health outcomes. Orem's theory provides a framework for communication, structure, knowledge, and goals that can facilitate nursing actions. Three interrelated theories lie within the self-care deficit nursing theory. The first "theory of self-care" assume individual innately desire self-care support. The second theory self-care deficit establishes the need for nursing intervention. Lastly, the third theory of nursing system helps the individual overcome or adapt to the self-care deficit (Peprtin, 2016). Results from this research can compare to all three theories within the Self-Care Deficit Theory. Participants from this research are seeking tools and resources to improve their knowledge and management of diabetes. Secondly, nursing intervention is applied through the administration of self-management diabetes education via a certified diabetic educator or another health care professional. Lastly, DSME helps the participant overcome or adapt to their diabetes through lifestyle modifications and health management.

Evaluation of Your Logic Model

The project results show that DSME is beneficial for increasing diabetes knowledge and confidence regarding diabetes management. The assumptions of the logic model were that DSME would increase patient knowledge of diabetes and risk factors, improve perceived self-management ability, and increase confidence with making lifestyle changes. The logic model displays the transition between initial diabetes encounter with the provider to resources and education necessary to reach desired

outcomes. The project results demonstrate an expected relationship between these concepts. Based on these results it was determined DSME education improves both knowledge and patient self-management confidence of diabetes.

Limitations

The method chosen for the research subjects was a one-group pretest-posttest design using descriptive statistics, mean, and standard deviation. One limitation in the study included poor attendance rates of participants resulting in a small sample size of 31 participants. The project timeline from December 1, 2018, to February 28, 2019, may have contributed to the smaller sample size. It would be beneficial for a minimal six-month timeline during peak participation months. It is noted December and January tend to be smaller sessions due to the holidays and participants reluctance to change nutritional habits during these periods. Another limitation is the potential for participant response bias due to the use of identical pre and post instruments. There is no sampling bias because participants were randomly selected from group participants on the day of the DSME sessions.

The instrument used in the study was adapted from the RWJF diabetes initiative program. The original survey is a four-page assessment tool used to assess health status, diabetes knowledge, self-efficacy, and daily health behaviors. The instrument was adapted to include only diabetes knowledge and self-efficacy questions for this project. The author believes there to be no negative impact on the study results from the adapted instrument.

Implications for Future Projects and Research

Evaluation of DSME is a cost-effective method to ensure national standards are being met in the DSME curricula. The prevalence of diabetes continues to grow at a steady rate in the United States. Evaluation of the DSME program from a patient perspective is necessary to address patient health beliefs, current diabetes knowledge, emotional concerns, and the ability to utilize tools provided to overcome self-management challenges. Future project designs could incorporate additional assessments of health status and daily health behaviors. This research could be replicated with any DSME program incorporating AADE-7 Self-Care Behaviors. DSME programs could benefit from evaluation of each measure to alter the DSME curricula for increased outcomes.

To improve the design for this project, the author could increase the interval between intervention and data collection. For example, the participants would be randomly assigned between two groups, a test group, and a control. The participants would fill out the surveys at the one week, one month, and six months follow up. This would help eliminate recall bias. The results would be compared to pre-test and posttest at varying intervals. This could potentially indicate a need for increased DSME sessions per year.

Implications for Practice, Health Policy, and Education

The results of this study determine that DSME is beneficial for individuals with prediabetes, type 1, or type 2 diabetes. Participant outcomes were positive with a post-DSME mean of (4.3) on knowledge and (4.1) on confidence. These results demonstrate that DSME is beneficial for improving patient knowledge and self-management

confidence in diabetic care. Recommended changes to nursing practice could include incorporation of DSME curricula evaluation from the participant perspective.

Implementation of internal program evaluation could potentially become a standard of care.

Implementation of patient perspective surveys could be a practice change for nurse practitioners and providers of diabetic patients. This change could be initiated at the initial PCP visit for current diabetes knowledge level. Patients could be provided with more individualized diabetic information prior to attending DSME. The more providers work together to increase patient knowledge, the higher chance of outcome success is provided to the patient.

Conclusion

The purpose of this study was to evaluate a multicomponent group diabetes self-management education program among adults in the SEK area to establish baseline self-management abilities and knowledge. This will allow the CDE to determine what components of self-management education individuals perceive as the most challenging. This analysis provides evidence to sections of the DSME curricula that were presented thoroughly, and sections underemphasized. With this knowledge, the DSME coordinator can alter the curricula to improve patient experience and knowledge essential to optimal diabetes management. Through data analysis, it was apparent that the current DSME evaluated met the AADE-7 self-care behaviors. These findings contribute to nursing knowledge by demonstrating the value of the DSME program from a patient standpoint. DSME has been proven to benefit diabetic patients by decreasing the HgbA1c level and daily blood glucose levels. The study indicates that DSME is an excellent tool that can be

utilized to improve patient understanding of diabetes complications and health risks.

Additionally, patients found the DSME program improved their overall understanding of preventative measures, health maintenance activities, and dietary modifications. Overall, patients found the DSME program effective for increasing diabetes knowledge and confidence with self-management practices.

References

- A.D.A.M., Inc. (n.d.). Choosing a primary care provider. Retrieved from U.S. National Library of Medicine: <https://medlineplus.gov/ency/article/001939.htm>
- AADE., (2014). AADE7 Self-Care Behaviors American Association of Diabetes Educators (AADE) Position Statement.
https://www.diabeteseducator.org/docs/default-source/legacy-docs/_resources/pdf/publications/aade7_position_statement_final.pdf?sfvrsn=4
- Albright, A., (2012). The national diabetes prevention program: from research to reality. *Diabetes Care Educ Newsl.* 2012; 33 (4): 4-7.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4593752/pdf/nihms717832.pdf>
- Anees A Siddiqui, Shadab A Siddiqui, Suhail Ahmad, Seemi Siddiqui, Iftikhar Ahsan, Kapendra Sahu “Diabetes: Mechanism, Pathophysiology and Management-A Review” *Int. J. Drug Dev. & Res.*, April-June 2013, 5(2): 1-23.
- American Diabetes Association. (2018). Common Terms. Retrieved from American Diabetes Association: <http://www.diabetes.org/diabetes-basics/common-terms/>
- American Diabetes Association. (2018). Diagnosis diabetes and learning about prediabetes. Retrieved from: <http://www.diabetes.org/diabetes-basics/diagnosis/>
- American Diabetes Association. (2017). The staggering cost of Diabetes. Retrieved from American Diabetes Association: <http://www.diabetes.org/advocacy/news-events/cost-of-diabetes.html>
- American Diabetes Association. (2015). Diabetes self-management education and support in type 2 diabetes: A joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy

- of Nutrition and Dietetics. doi: <https://doi.org/10.2337/dc15-0730>
- American Diabetes Association. (2018). Economic cost of diabetes in the U.S. in 2017. *Diabetes Care* 2018; 41: 917-928. <https://doi.org/10.2337/dci18-0007>
- Balk, E. M., Earley, A., Raman, G., Avendano, E. A., Pittas, A. G., & Remington, P. L. (2015, September 15). Combined Diet and Physical Activity Promotion Programs to Prevent Type 2 Diabetes Among People at Increased Risk: A Systematic Review for the Community Preventive Services Task Force. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4692590/>
- Bayat, F., Shojaeezadeh, D., Baikpour, M., Heshmat, R., Baikpour, M., & Hosseini, M. (2013). The effects of education based on extended health belief model in type 2 Diabetic patients: a randomized controlled trial. *Journal of Diabetes*, 2(1), 45.
- Campbell, A. (2016, November 28). *Type 1 Diabetes vs. Type 2*. Retrieved from Diabetes Self-Management: <https://www.diabetesselfmanagement.com/blog/type-1-diabetes-vs-type-2/>
- CDC. (2017, July 18). *Centers for Disease Control and Prevention*. Retrieved from CDC: <https://www.cdc.gov/media/releases/2017/p0718-diabetes-report.html>
- Census Bureau. (2018, January 25). *United States of Department of Agriculture Economic Research Services*. Retrieved from USDA: <https://data.ers.usda.gov/reports.aspx?ID=17826>
- Charron-Prochownik, Denise & Zgibor, Janice & Peyrot, Mark & Peeples, Malinda & McWilliams, Janis & Koshinsky, Janice & Noulet, William & Siminerio, Linda. (2007). The Diabetes Self-Management Assessment Report Tool (D-SMART®)

- Process Evaluation and Patient Satisfaction. *The Diabetes Educator*. 33. 833-8. 10.1177/0145721707307613.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approach* 4th Edition. Sage publications.
- Dehkordi; Mardanian, Leila; Samereh, Abdoli. (2017). Diabetes Self-Management Education; Experience of People with Diabetes (111-118). *ProQuest*.
- Fain, J. A. (2007). Psychometric Properties of the Spanish Version of the Diabetes Self-Management Assessment Report Tool. *The Diabetes Educator*, 33(5), 827-832. doi:10.1177/0145721707308355
- Fisher, EB., Brownson, CA., O'Toole, ML., Anwuri, VV., Shetty, G. (2007). Perspectives on self-management from the Diabetes Initiative of Robert Wood Johnson Foundation. *The Diabetes Educator*. doi: 10.1177/0145721707304124.
- Garrett, K., (2012). Diabetes initiative. Published by Robert Wood Johnson Foundation. <https://www.rwjf.org/content/dam/farm/reports/reports/2012/rwjf403006>
- Gonder-Frederick, L. (2014). Lifestyle Modifications in the Management of Type 1 Diabetes: Still Relevant After all these years? *Diabetes Technology & Therapeutics*, 695-698.
- Jones, C., Smith, H., Llewellyn, C. (2014). Evaluating the effectiveness of health belief model intervention in improving adherence: a systematic review. *Health Psychology Review*, Vol 8 (3).
- Lavelle, D., Zeitoun, J., Stern, M., Butkiewicz, E., Wegner, E., & Reinisch, C. (2016). Diabetes Self-Management Education in the Home. *Cureus*, 8(7), e710. doi:10.7759/cureus.710

- Lu, Y., Xu, J., Zhao, W., & Han, H. (2015). Measuring Self-Care in Persons with Type 2 Diabetes. *Evaluation & the Health Professions*, 39(2), 131-184.
doi:10.1177/0163278715588927
- Medline Plus. (2016). *Prediabetes*. Retrieved from U.S. National Library of Medicine:
<https://medlineplus.gov/prediabetes.html>
- Moazami, F., Bahrapour, E., Azar, M., Jahedi, F., & Moattari, M. (2014). Comparing two methods of education (virtual versus traditional) on learning of Iranian dental students: a post-test only design study. *BMC Medical Education*.
- The National Institute of Diabetes and Digestive and Kidney Diseases. (2018). Managing diabetes.
<https://www.niddk.nih.gov/healthinformation/diabetes/overview/managing-diabetes>
- Peptrin, A. (2016). *Self Care Deficit Theory*. Retrieved from Nursing Theory:
<http://www.nursing-theory.org/theories-and-models/orem-self-care-deficit-theory.php>
- Prediabetes. (2017, August 02). Retrieved from <https://www.mayoclinic.org/diseases-conditions/prediabetes/diagnosis-treatment/drc-20355284>
- Romesh, K. (2018). Type 1 Diabetes mellitus. *Medscape*. Retrieved from:
<https://emedicine.medscape.com/article/117739-overview#a1>
- Ross, S., Benavides-Vaello, S., Schumann, L., & Haberman, M. (2013). Issues that impact type-2 diabetes self-management in rural communities. *American Association of Nurse Practitioners*, 653-660.

- Schwennesen, N., Henriksen, J. E., & Willaing, I. (2015). *Patient explanations for non-attendance at type 2 diabetes self-management education: a quality study*. Retrieved from Nordic College of Caring Science: doi: 10.1111/scs.12245
- Shah, M. A. (2015). Compare and Contrast of Grand Theories: Orem's Self-Care Deficit Theory and Roy's Adaptation Model. *INTERNATIONAL JOURNAL OF NURSING*.
- Type 1 diabetes. (2017, August 07). Retrieved from <https://www.mayoclinic.org/diseases-conditions/type-1-diabetes/diagnosis-treatment/drc-20353017>
- U.S. Census Bureau QuickFacts: Crawford County, Kansas; UNITED STATES. (2017). Retrieved from: <https://www.census.gov/quickfacts/fact/table/crawfordcounty,Kansas,US/PST045217>
- Wooley, D. S., & Kiner, T. J. (2016). *Comparing perceived self-management practices of adult type 2 diabetic patients after completion of a structured ADA certified diabetes self-management education program with unstructured individualized nurse practitioner-led diabetes self-management edu*. Retrieved from Elsevier: <http://daneshyari.com/article/preview/2644752.pdf>
- Yang, L., Wu, Q., Hao, Y., Cui, Y., Liang, L., Gao, L., . . . Yin, H. (2016). Self-management behavior among patients with diabetic retinopathy in the community: A structural equation model. *Quality of Life Research*, 26(2), 359-366. doi:10.1007/s11136-016-1396-
- Yusuff, K. B., Obe, O., & Joseph, B. Y. (2008). Adherence to anti-diabetic drug therapy and self-management practices among people with type-2 diabetes in Nigeria. *Pharmacy World & Science*, 30(6), 876-883. doi:10.1007/s11096-008-9243-2

APPENDIX

Appendix A
Pre-test and Posttest Instruments

DIABETES PROJECT PARTICIPANT QUESTIONNAIRE PRE-TEST

For the following items, please circle the letter by the answer that best represents you (one per item)

1. Age
 - A. 19-29
 - B. 30-49
 - C. 50-59
 - D. 60-69

2. Gender
 - A. Male
 - B. Female

3. Zip Code of where you live _____

4. Which of the following best describes your race?
 - A. White or Caucasian
 - B. Black or African-American
 - C. Asian
 - D. Native Hawaiian or other Pacific Islander
 - E. American Indian or Alaska Native
 - F. Other _____ (please describe)

5. What is the highest grade you completed in school?
 - A. Grade School (1-8th grade) PUT CHECK BOXES BY THESE LIKE YOU HAVE ABOVE
 - B. High School (9-12th grade)
 - C. College
 - D. Post Graduate

6. Are you currently employed?
 - A. Yes
 - B. No
 - C. Retired
 - D. Disabled

7. Do you know what type of Diabetes you have?
 - A. Yes
 - B. NoIf Yes, what type?
 - A. prediabetes
 - B. type 1
 - C. type 2

8. During the past year, have you participated in an education program about diabetes?
 - A. Yes
 - B. No

Diabetes Knowledge

Using the scale below, please circle the number that best represents your knowledge level of diabetes.

Very Poor=1 Poor=2 Fair=3 Good=4 Very Good=5

How do you rate your current knowledge of:

9.	overall diabetes care	1	2	3	4	5
10.	ways to cope with stress	1	2	3	4	5
11.	meal planning for blood sugar control	1	2	3	4	5
12.	how diet affects blood sugar levels	1	2	3	4	5
13.	how physical activity affects blood sugar levels	1	2	3	4	5
14.	how medicine affects blood sugar levels	1	2	3	4	5
15.	prevention of HIGH blood sugar	1	2	3	4	5
16.	treatment of HIGH blood sugar	1	2	3	4	5
17.	prevention of LOW blood sugar	1	2	3	4	5
18.	treatment of LOW blood sugar	1	2	3	4	5
19.	prevention of long-term health problems of diabetes	1	2	3	4	5
20.	taking care of your feet	1	2	3	4	5
21.	benefits of improving your blood sugar control	1	2	3	4	5

Using the scale below please circle the following number that best represents your confidence level

Not Confident=1 Somewhat Confident=2 Moderately Confident=3 Confident=4 Completely Confident=5

How do you rate your current confidence with:

22.	doing all the things necessary to manage your condition on a regular basis?	1	2	3	4	5
23.	keeping stress and worry from affecting the things you want to do?	1	2	3	4	5
24.	following your meal plan when you must fix or share food with other people who do not have diabetes	1	2	3	4	5
25.	choosing healthy foods to eat when you are hungry (for example, snacks)?	1	2	3	4	5
26.	exercising at least 15 to 30 minutes a day, 4 to 5 most days of the week?	1	2	3	4	5
27.	knowing what to do when your blood sugar level goes higher or lower than it should be?	1	2	3	4	5
28.	judging when the changes in your health mean you should visit the doctor?	1	2	3	4	5
29.	controlling your diabetes so that it does not interfere with the things you want to do?	1	2	3	4	5

30. What do you find to be the hardest part of living with diabetes? (Please answer below)

DIABETES PROJECT PARTICIPANT QUESTIONNAIRE POST-TEST

For the following items, please circle the letter by the answer that best represents you (one per item)

1. Age
 - A. 19-29
 - B. 30-49
 - C. 50-59
 - D. 60-69

2. Gender
 - A. Male
 - B. Female

3. Zip Code of where you live _____

4. Which of the following best describes your race?
 - A. White or Caucasian
 - B. Black or African-American
 - C. Asian
 - D. Native Hawaiian or other Pacific Islander
 - E. American Indian or Alaska Native
 - F. Other _____ (please describe)

5. What is the highest grade you completed in school?
 - A. Grade School (1-8th grade) PUT CHECK BOXES BY THESE LIKE YOU HAVE ABOVE
 - B. High School (9-12th grade)
 - C. College
 - D. Post Graduate

6. Are you currently employed?
 - A. Yes
 - B. No
 - C. Retired
 - D. Disabled

7. Do you know what type of Diabetes you have?
 - A. Yes
 - B. NoIf Yes, what type?
 - A. prediabetes
 - B. type 1
 - C. type 2

8. During the past year, have you participated in an education program about diabetes?
 - A. Yes
 - B. No

Diabetes Knowledge

Using the scale below, please circle the number that best represents your knowledge level of diabetes.

Very Poor=1 Poor=2 Fair=3 Good=4 Very Good=5

How do you rate your current knowledge of:

9.	overall diabetes care	1	2	3	4	5
10.	ways to cope with stress	1	2	3	4	5
11.	meal planning for blood sugar control	1	2	3	4	5
12.	how diet affects blood sugar levels	1	2	3	4	5
13.	how physical activity affects blood sugar levels	1	2	3	4	5
14.	how medicine affects blood sugar levels	1	2	3	4	5
15.	prevention of HIGH blood sugar	1	2	3	4	5
16.	treatment of HIGH blood sugar	1	2	3	4	5
17.	prevention of LOW blood sugar	1	2	3	4	5
18.	treatment of LOW blood sugar	1	2	3	4	5
19.	prevention of long-term health problems of diabetes	1	2	3	4	5
20.	taking care of your feet	1	2	3	4	5
21.	benefits of improving your blood sugar control	1	2	3	4	5

Using the scale below please circle the following number that best represents your confidence level

Not Confident=1 Somewhat Confident=2 Moderately Confident=3 Confident=4 Completely Confident=5

How do you rate your current confidence with:

22.	doing all the things necessary to manage your condition on a regular basis?	1	2	3	4	5
23.	keeping stress and worry from affecting the things you want to do?	1	2	3	4	5
24.	following your meal plan when you must fix or share food with other people who do not have diabetes	1	2	3	4	5
25.	choosing healthy foods to eat when you are hungry (for example, snacks)?	1	2	3	4	5
26.	exercising at least 15 to 30 minutes a day, 4 to 5 most days of the week?	1	2	3	4	5
27.	knowing what to do when your blood sugar level goes higher or lower than it should be?	1	2	3	4	5
28.	judging when the changes in your health mean you should visit the doctor?	1	2	3	4	5
29.	controlling your diabetes so that it does not interfere with the things you want to do?	1	2	3	4	5

30. What do you find to be the hardest part of living with diabetes? (Please answer below)

Appendix B

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

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 Graduate and Continuing 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): Stormy D Carter
2. Department: Nursing
3. Local Address: 205 Barbieri St Arma KS 66712
4. Phone: 620.875.6715
5. E-mail Address: stormycarter@gus.pittstate.edu
6. Project Title: A Pre and Post Survey to Evaluate Patient Perception of Group Diabetes Self-Management Education
7. Expected Completion Date: May 2019 Education
8. Expected Starting Date: December 1, 2018

9. Is this project (check all that apply): Use review criteria in Form CR-1 to determine which category of review applies.

- | | | |
|---|---|--|
| <input type="checkbox"/> Application for Full Review | <input type="checkbox"/> Protocol Change | <input type="checkbox"/> Thesis/Special Investigation |
| <input type="checkbox"/> Being submitted for external support | <input type="checkbox"/> Continued Review | <input checked="" type="checkbox"/> Application for Expedited Review |
| <input type="checkbox"/> Being conducted in a foreign country | <input type="checkbox"/> Faculty Research | <input checked="" type="checkbox"/> Application for Exempt Review |
| <input type="checkbox"/> Publishable research | <input type="checkbox"/> A Class Project | |

10. If notification of human subject approval is required give date required: December 1, 2018

Name of agency: Community Health Centers of Southeast Kansas

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

Faculty Sponsor: Dr. Ashleigh Heter

Department: Nursing

Phone: 620.231.7000

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