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Type 2 Diabetes Prevention and Management in a Primary Care Clinic Setting

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Walden University
2016

Abstract

Type 2 Diabetes Prevention and Management in a Primary Care Clinic Setting

by

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MSN/FNP, California State University, Long Beach, 2011

BSN/PHN, University of Phoenix, 2006

Midwife, University Teaching Hospital Aba, Abia State, Nigeria, 1990

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Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

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December 2016

Abstract

Approximately 8.3% of the U. S. population has type 2 diabetes. Preventing the onset and improving the management type 2 diabetes are crucial for health care professionals. The purpose of this project was to develop and evaluate a type 2 diabetes prevention and management education program in a primary care setting using group medical appointments (GMAs). The chronic care model provided the framework for the study. The education program consisted of information from the Centers for Disease Control on the management of type 2 diabetes to be delivered by clinic staff using a GMA approach, a timeline for implementing the education program, and evaluation strategies for assessing patient health outcomes. Staff participants included 9 females and 1 male. One week after the presentation, staff responded to open-ended questions addressing the plan for prevention and management of type 2 diabetes. Findings indicated that staff unanimously approved the content of the program, thought the program could realistically be implemented, thought the proposed evaluation methods were appropriate, and thought the program would have a positive influence on patient health outcomes. Prevention and management education programs using a GMA approach may be used to reduce incidence and improve management of type 2 diabetes.

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Dedication

I dedicate this dissertation to God Almighty my creator, my strong pillar, my source of inspiration, wisdom, knowledge, and understanding. He has been the source of my strength throughout this program. I also dedicate this dissertation to my husband, Chief Udo Nwachuku (Enyioha 1), who has encouraged me all the way and whose encouragement has made sure that I give it all and finish what I have started. I love you so much for being my rock; thank you for helping me.

To my three children, all future medical doctors, Adanma (2nd year), Ikenna (2nd year), and Kelechi (passed his MCAT). Thank you for being there for me throughout the entire doctoral program including proofreading in spite of your busy schedules. The three of you have been my best cheerleaders. My love for you all can never be quantified. To my church family, thank you for all the prayers throughout the process. To my late parents, Nnanyi Ben Onyemaobi and Nneoma Rose Onyemaobi, who gave me the first leg in education, whose words of encouragement and push for persistence still ring in my ears today. Both of you passed away too soon and did not live to see me reach my terminal education. You will never be forgotten. I also dedicate this dissertation to my siblings, who have supported me throughout the process. Thank you all.

Acknowledgments

I would like to express my deepest gratitude to my chairperson, Dr. Eileen Fowles, for her encouragement, support, patience, and guidance along every step of this DNP journey. You are truly a caring person and an excellent professor. To a great professor Dr. Terry Allison, to my committee member Dr. Francisca Farr, and my University Research Reviewer Dr. Patti Urso, the magnitude of my appreciation goes out to you all. Thank you all for your help in achieving this goal. Many thanks to my family, friends, and professional colleagues who were so supportive of me every step of the way. May the almighty God bless you all.

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Section 1: Nature of the Project

Diabetes is a chronic disease that requires clinicians and individuals with diabetes to make daily management decisions and to perform complex care activities. Effective delivery of care to patients with diabetes involves experts in educational, clinical, psychosocial, and behavioral diabetes care (Bowen & Rothman, 2010). Clear communication and effective collaboration among the health care team that includes a provider, an educator, and a person with diabetes are critical to ensure that goals are clear, that progress toward goals is being made, and that appropriate interventions (educational, psychosocial, medical, and behavioral) are being used. However, the inadequate control of diabetes continues despite the advance in technology, diagnosis, and treatment (Nam, Chesla, Stotts, Kroon, & Janson, 2011).

Poor control of diabetes may develop as a result of inadequate management or compliance with treatment protocols. Nurses with a doctorate in nursing practice (DNP) may recommend evidence-based practice changes that will reduce the cost of diabetes, improve documentation, enhance quality of life, and improve diabetes care outcomes. In this section, I discuss the overview of the project including the background, problem statement, purpose statement, project objectives, significance to practice, project question, evidence-based significance of the practice, implications for social change, and definition of terms. Additionally, I address the assumptions and limitations of evidence-based practice to implement a diabetes prevention and management program in a primary care clinical setting.

Problem Statement

Although extensive actions have been taken to educate the diabetic population on methods of preventative health care, there are still issues that arise when trying to achieve this goal. One obstacle that has not been adequately addressed in educating patients is standard individual office visits between the patient and health care provider; the office visit time is often

too brief to allow health care providers the opportunity to monitor behavioral changes, discuss the adoption of new treatment plans, and answer any lingering questions (Ridge, 2012). An unsatisfactory diabetes prevention outcome is attributed not only to individuals at risk for type 2 diabetes but also to health care providers. According to Maryniuk, Mensing, Imershein, Gregory, and Jackson (2013), nurses may not be aware of the resources available for the effective prevention and management of type 2 diabetes.

A needs assessment of type 2 diabetes and its prevention is vital in the primary care setting. Type 2 diabetes is a chronic health illness that has serious complications if left untreated (Nam et al., 2011). Type 2 diabetes compromises a person's quality of life. It not only affects the patient with the disease but it also affects family members and friends (Nam et al., 2011). Diabetes prevention and management education is one way to reach the population at risk for type 2 diabetes and those who already have type 2 diabetes. According to Nam et al. (2011), poor control of diabetes is a result of failure to initiate or enhance appropriate diabetes management and prevention by health care providers and inadequate management by patients.

There is a gap in nursing knowledge regarding diabetes care and prevention (Maryniuk et al., 2013). Nurses and certified nurse educators are trained to provide diabetes education to the population with diabetes or those at risk for diabetes. One third or one half of the population with diabetes or at risk for diabetes has never had formal diabetes education (Maryniuk et al., 2013). Providing diabetes prevention and management education to millions of people at risk for type 2 diabetes in the United States is a challenge to health care clinicians.

Project Purpose

The purpose of this evidence base project (EBP) project was to develop an implementation and evaluation plan that incorporates diabetic education within a group medical model with the goal of decreasing the HGB A1C levels in prediabetics and type 2 diabetic

patients. Patients' lifestyle and behavior play a significant role in patients' physical and mental health. Interventions aimed at changing patients' unhealthy lifestyles are a priority for health care provider visits. Changing lifestyle behaviors can be difficult and require significant effort, time, and motivation from both the health care provider and patient. Introduction of the group medical appointment (GMA) model with diabetic education for prediabetic and type 2 diabetic patients in a primary care setting will provide a different way of delivering care compared to traditional medical office visits (Lavoie, Wong, Chongo, Browne, MacLeod, & Ulrich, 2013).

Forming a Population Intervention, Comparator and Outcomes (PICO) question was the first step in this evidence-based practice project. One of the main reasons for formulating a PICO question was to provide relevant and best evidence research that could be translated into practice (Melnyk & Fineout-Overholt, 2010). The PICO question for this evidence-based practice project was the following: Among primary care clinic nurses and clinicians caring for prediabetic and type 2 diabetic patients, will an educational module based on the group medical appointment decrease hemoglobin A1C and promote the implementation of a type 2 diabetes prevention and management program in a primary care clinic setting?

The EBP project of interest was articulated with each essential component as follows: *P* refers to the population of interest for the EBP project, which was adults with prediabetes and type 2 diabetes between the ages of 21 and 80 years. Adult patients were able to participate, communicate, and consent with the group medical appointments. *I* refers to the intervention of interest, which was designing an education tool with GMAs. This included a brief individual assessment including height, weight, blood pressure, pulse, and BMI measurements. Then the group was placed together based on when education on diabetes was provided. The education included dietary intake, carbohydrate counting, nutrition, exercise, medication compliance, and

goal setting. *C* refers to the comparison of interest, which included results of HGB A1C levels from patients receiving the traditional office visit and patients receiving GMAs. Patients came to the first GMA with recent HGB A1C levels from the traditional office visit. The GMA consisted of a review of current results and education on lifestyle changes and nutrition. Three months later, HGB A1C levels were obtained and compared to the baseline levels. A presurvey about current lifestyle was also obtained and compared to postintervention to evaluate compliance and behavioral lifestyle change. *O* refers to the primary outcome of interest, which was to reduce HGB A1C levels and thereby prevent prediabetes patients from developing type 2 diabetes and prevent complications with adult type 2 diabetic patients. Several additional outcomes of interest included medications, blood pressure changes, and weight loss or BMI changes. *T* refers to the 3-month period from the initial GMA to the follow-up GMA visit.

Nature of Doctoral Project

The purpose of this quality improvement project was to develop a plan for implementing a type 2 diabetes prevention and management program using group medical appointment in a primary care setting and to have clinic staff evaluate the program. The objective of the project was to provide an outline of a program addressing the delivery of an educational program on type 2 diabetes prevention and management using a group medical appointment model in the primary care clinic setting. Evaluation of the educational program on type 2 diabetes prevention and management in a primary care setting was also conducted. The educational program incorporated group medical appointment to serve as a new standard of care for the prevention and management of type 2 diabetes among prediabetes and type 2 diabetic patients.

The significance of the DNP project was to emphasize the importance of developing a plan that can be implemented by primary care clinics to help raise awareness of type 2 diabetes prevention and management in individuals with prediabetes and type 2 diabetes. The project may

empower primary care clinicians to review the plan and consider implementing components of the type 2 diabetes prevention and management program for individuals with prediabetes and those who have already developed type 2 diabetes. If implemented, this plan has the potential to reduce the cost of health care by decreasing unnecessary care, decreasing the incidence of type 2 diabetes, and reducing complications from type 2 diabetes. The plan outlined in this project will support the Healthy People 2020 goal to reduce health disparity among the population with diabetes (Healthy People 2020, 2011).

Nurses and clinicians need to continuously look for the opportunity to advance their knowledge and awareness of new technology, techniques, and approaches to formulate strategies to measure outcome (Bradshaw, 2010). Nurses are frontline providers and their decisions and input increase knowledge, awareness, and change in an organization (Bradshaw, 2010). Translating the DNP project into practice may increase the knowledge, decision-making, critical thinking, and confidence level of nurses in the quality of diabetes prevention and management education given to the population with prediabetes and type 2 diabetes. Additionally, the documentation and communication between health care professionals and individuals with prediabetes and diabetes may improve.

Significance of the Project

Lifestyle modification is the best treatment for prediabetes prevention, for reduction of the progression to type 2 diabetes, and for type 2 diabetes management. Healthy lifestyle practices could prevent 80-90% of cases of type 2 diabetes (Yates et al., 2012). In high-risk populations, Yates et al. (2012) found that the risk of progressing to type 2 diabetes could be reduced by up to 60% with lifestyle interventions aimed at promoting a healthy diet, moderate to vigorous physical activity, and weight loss or weight maintenance. An increase in moderate physical activity and a reduction in weight can decrease the risk of type 2 diabetes by 58% with

prediabetes patients (Letassy et al., 2010). There is a positive relationship between weight reduction, physical activity, and diabetes prevention and management. Education on making these lifestyle changes may be more effective when delivered in a GMA setting compared to the traditional individual medical appointment.

Implications for Social Change in Practice

If implemented in the medical office clinics, the plan outlined in this DNP project has the potential to improve preventive and proper management behavior among individuals with prediabetes and those with type 2 diabetes who are at risk of developing complications such as cardiovascular disease, kidney failure, gangrene, and other chronic diseases. Early awareness and intervention are crucial to prevent and adequately manage type 2 diabetes. Almost every family or hospital unit has an individual with diabetes, a history of diabetes, or risk for diabetes (Young, 2011). Poor diabetes management has a detrimental effect on patients, families, and communities. The implementation of a type 2 diabetes prevention and management educational intervention in the medical office clinic setting may create social change in the community. The project may lead to the integration of a type 2 diabetes prevention program and a type 2 diabetes management program in a medical clinic. The project may increase the number of prediabetics and type 2 diabetics who engage in lifestyle modification behavior. The project may also decrease the incidence of type 2 diabetes and reduce the health disparity of diabetes among the U.S. population.

Prevention and management of type 2 diabetes have a positive effect on the quality of life and overall well-being of many people (Murray, Abadi, Blair, Dunk, & Sampson, 2011). Most of the activities designed to prevent and manage type 2 diabetes have focused on lifestyle modification intervention techniques such as diet and exercise. Individuals who engage in lifestyle modification behaviors to prevent and manage type 2 diabetes will also benefit from the

other health benefits of exercise and a healthy diet. This lifestyle leads to weight reduction, cardiovascular fitness, decreased cardiovascular risk, improved sleep patterns, and decrease in the severity of stress and depression. Additionally, it decreases the financial burden on the patients and their families and health care system.

Definitions of Terms

Diabetes: A progressive disorder of abnormal elevation in the blood glucose level as a result of a lack of insulin, decreased ability of the body to use insulin, or both (American Diabetes Association [ADA], 2011).

Insulin: A hormone that allows sugar (glucose) in the body cell to be converted into energy. A defect in insulin secretion, insulin action, or insulin resistance will result in high blood sugar (ADA, 2011).

Group medical appointments (GMAs): Shared medical appointments or group medical visits, which can be an innovative approach to diabetic care (Lavoie et al., 2013). Group medical appointments may be used in combination or in place of the usual one-on-one traditional care given by a health care provider. The group medical appointments typically include a group of patients, from four to six at a time, group education, shared problem solving, and a focused private medical examination that will allow some individual time with the health care provider (Lavoie et al., 2013). Appointments may last from 60 to 90 minutes depending on the number of patients at each session. Patients have the opportunity in the group environment to learn or provide encouragement and advice to others attending, which they may not have received in a short traditional office visit.

Prediabetes: Individuals with prediabetes have high blood sugar but not high enough to be considered or diagnosed as diabetics. People with prediabetes are at increased risk of

developing type 2 diabetes within 5 years if not controlled or corrected with lifestyle modification (ADA, 2011).

Type 2 diabetes: Known as non-insulin-dependent or adult-onset diabetes, type 2 diabetes occurs when the body develops resistance to insulin or does not produce enough insulin to regulate the blood glucose (ADA, 2011).

Assumptions and Limitations

I assumed the implementation of the DNP project to promote type 2 diabetes prevention and management could lead to changes in the primary care clinical setting. The clinic staff and clinicians may value the program and accept the education. The patients who visit the clinic may accept the teaching, make lifestyle modifications, and believe that prevention and management of diabetes are worth the effort. Also, I assumed that the project would improve the quality of care and patient outcomes in the primary care setting by decreasing the incidence of type 2 diabetes, decreasing HemoA1C and diabetic complications, improving patient and staff satisfaction, and reducing medical cost from diabetes care.

One of the major limitations of implementing the diabetes prevention program in a primary care setting was resistance to change. Change is stressful, may be difficult, and may disrupt the primary care setting clinic custom, causing resistance. Other limitations included patients' resistance and noncompliance. Expecting all members of the group to accept change at the same time is impractical. According to Kelly (2011), 68% of the population will express a personality type that is resistant to change, while 32% will express a personality that is accepting to change. Another factor that could negatively affect the implementation of the DNP project in a primary care clinic was limited time. Time limitations make it difficult to evaluate the outcome of the implementation from the patient perspective and to incorporate preventive behavior

strategies into patient care before the end of the program. The project also required funding to purchase materials necessary for successful planning and implementation.

Summary

The need to implement behavior changes is becoming more accepted by health care organizations, especially changes that are based on an evidence-based practice that will improve health care outcomes. Primary care clinic health care clinicians play a role in disease prevention and management of diabetes by motivating, educating, and providing feedback to individuals at risk for type 2 diabetes and patients already with type 2 diabetes. Section 2 presents a literature review and theoretical framework of planning type 2 diabetes prevention and management in a primary care clinic setting.

Section 2 Background and Context

Diabetes and its complications can be significantly delayed or prevented through simple, cost-effective intervention (International Diabetes Federation, 2010). The purpose of this DNP project was to develop an implementation and evaluation plan outlining a diabetes prevention and management program in a primary care clinic setting. This section presents the literature review and the evidence-based framework underlying the diabetes prevention and management program in a primary care clinic setting.

Background

Diabetes threatens the health of many people living in the United States. The American Diabetes Association (ADA, 2011) and Centers for Disease Control and Prevention (CDC, 2008) have developed numerous educational materials and activities to decrease the prevalence and incidence of type 2 diabetes. Diabetes is still a significant health problem and is the seventh leading cause of death in the United States (Healthy People 2020, 2011). There is an estimated 15-year reduction in lifespan that is attributed to diabetes. People with diabetes have a high risk of developing "stroke, heart disease, blindness, kidney failure, gangrene and lower-limb amputations" CDC (2014). The CDC (2014) also reported that in 2012, the total diabetes cost (direct and indirect) in the United States was $245 billion. The direct medical expenses of $176 billion were 2.3 times more than the population without diabetes, and the indirect costs from work loss, disability, and death were $69 billion (CDC, 2014). The challenge of diabetes prevention and management is to reduce the financial and human costs of diabetes through prevention of new cases and management of type 2 diabetes.

According to the CDC (2014), in 2012, 29.1 million people in the United States of all ages had diagnosed (21.0 million) or undiagnosed (8.1 million) diabetes, and 28.9 million were

20 years of age or older. When separated by age, 4.3 million were 20 to 44 years old, 13.4 million were 45 to 65 years old, and 11.2 million were 65 years or older (CDC, 2014). The CDC also reported that the number of men among the affected population was 15.5 million while women amounted to 13.4 million. Newly diagnosed diabetes in 2012 for adults 20 years and older was 1.7 million. Among this population, 371,000 were 20 to 44 years old; 892,000 were 45 to 64 years old; and 400,000 were 65 years old or older (CDC, 2014). The CDC (2014) reported the differences in diagnosing rates by race and ethnicity from 2010 to 2012, which included European Americas at 7.6 %, Asian Americans at 9.0%, Hispanic Americans at 12.8 %, African Americans at 13.2%, and Native Americans at 15.9%. The age-adjusted rate of diagnosed diabetes among Hispanic American adults in Central and South America was 8.5%, for Cubans it was 9.3%, for Mexican Americans it was 13.9%, and for Puerto Ricans it was 14.8 % (CDC, 2014). Among the Asian American population, the CDC reported that the rate of diagnosis for the Chinese population was 4.4%, 13.8 % for Asian Indian, 11.3% for Filipinos, and 8.8% for other Asians. The rate for Alaska Natives was 6.0%, while the American Indians in Southern Arizona had a rate of 24.1 % (CDC, 2014). The increase in the number of individuals with diabetes from 2010 to 2012 is an indication that diabetes is a health care problem that requires attention.

The population with less than a high school education has a higher percentage of diabetes when compared to those with higher than a high school education (CDC, n.d.). The prevalence of diabetes also varies by state. The prevalence of diagnosed diabetes in 1994 was 4.5% in 25 of the states, 4.5% to 6.0% in 24 of the states, and over 6.0% in one state, but in 2010, all states had a prevalence of diabetes over 6.0%, and 15 of the states exceeded 9.0% (CDC, 2012). Mississippi had the highest rate of diagnosed diabetes at 11.3%, followed by

Alabama at 11.1% (CDC, 2012). The lowest rate of diagnosed diabetes was in Vermont at 5.8%,

followed by Montana and Minnesota at 6.2% each (CDC, 2012). The distribution of diabetes

across the states also showed an increase in the prevalence of diabetes, especially in the

Southeast. The primary care setting of interest provides care to the underserved community and

serves approximately 3,150 patients annually, and of those patients 8% are diabetic.

<div align="center">**Literature Search Strategy**</div>

The search strategy used in reviewing the literature included searching the electronic

databases CINAHL, Medline, Pub Med, Ovid Plus, ERIC, and Nursing Journals. The Cochrane

Library and Google Scholar, as well as reference lists of published articles and books, were also

used. Search terms included *diabetes*, *type 2 diabetes and hemoglobin A1C control*, *pre-

diabetics*, *adherence and compliance to lifestyle interventions*, *self-monitoring of blood glucose*,

diabetic diet, and *self-efficacy*. The articles selected specifically addressed health care

professional knowledge regarding diabetes prevention and management and diabetes education,

population belief about diabetes, lifestyle modification, and the burden of diabetes. Searches

were worldwide, limited to the English language, and included articles published from 2002 to

2015. Organization websites used were the CDC, ADA, and the U.S. Food and Drug

Administration (USFDA).

<div align="center">**Levels of Evidence from the Appraisal of Literature**</div>

This literature review focuses on studies that both support and refute the benefits of

incorporating diabetic education and monitoring of hemoA1C using GMAs in the current

prevention and management plan for type 2 diabetes in a clinical setting. Also, the literature

review addresses current studies on lifestyle intervention for diabetics, type 2 diabetes, and

factors influencing hemoglobin A1C and adherence to treatment regimens.

Burden of Diabetes

The correct projection of diabetes cost and health care burden is important for the future planning of health care needs and cost. Boyle, Thompson, Gregg, Barker, and Williamson (2010) conducted a study on the projection of the burden of diabetes among the U. S. adult population to the year 2050. Boyle et al. found an increase in the incidence of diabetes from eight cases per 1000 in 2008 to an estimated 15 cases per 1000 in 2050. The prevalence of diabetes will increase from 14% to 21% in 2010 and mortality prevalence will increase to 33% in 2050 (Boyle et al., 2010). Boyle et al. concluded that effective preventive interventions focused on high-risk populations could reduce the increase in the prevalence of diabetes. Lifestyle intervention can reduce the increase in diabetes prevalence and complications. Lavoie, J., Wong, S., Chongo, M., Browne, A., MacLeod, M., & Ulrich, C. (2013); conducted interviews with 34 providers and 29 patients who were engaged in GMAs. This study showed that the GMA approach offers an alternative for diabetes care that reflects ideal patient-centered care. This study's main finding was that patients form a relationship of care with their providers; that these relationships are voluntary; and that they facilitate respect and enable autonomy, accountability, fidelity, and humanity.

Lifestyle Modification

Intensive lifestyle intervention produces beneficial changes in physical activity, diet, biomedical and clinical parameters, and reduced risk for diabetes (Lindstrom et al., 2003). Nilsen, Bakke, and Gallefoss (2011) conducted a study that involved 213 participants at risk for type 2 diabetes to examine the effect of lifestyle intervention on individuals at risk for type 2 diabetes and concluded that modest clinical effort could lead to lifestyle changes in these patients. The consensus with type 2 diabetes prevention and management is the transfer of the research findings on lifestyle modifications into real-world practice. Jansink, Braspenning,

Weijen, Elwyn, and Grol (2010) showed that patients have limited insight into their behavior, healthy lifestyle knowledge, and lack the motivation to modify or sustain a better lifestyle. Jansink et al. concluded that nurses report insufficient time and lack of counseling as barriers in effective lifestyle counseling in diabetes care.

Lifestyle modification with dietary changes, moderate exercise, and weight control can prevent type 2 diabetes and improve diabetic management by decreasing hemoglobin A1c levels. Lifestyle modification is more effective and has a more prolonged impact on type 2 diabetes prevention and management than drug treatment (Gillies et al., 2007). Lifestyle intervention can improve patient outcome in individuals at risk for type 2 diabetes and those who have type 2 diabetes by reducing their hemoglobin A1C levels and decreasing diabetic complications. Lifestyle intervention in a structured environment plays an important role in helping patients achieve lifestyle changes.

Moore et al. (2011) conducted a randomized control trial to evaluate the effectiveness of a 6-month, group-based diabetes prevention program on a population at risk for prediabetes. The aim was to examine whether taking part in the program contributed to changes in modification risk factors for type 2 diabetes. Professional intervention, organizational intervention, and intervention with patient education improved process outcomes. Enhanced nursing roles and interventions with patient education resulted in desired patient health outcomes. The intervention group improved their motivation to change, diabetes knowledge, activity levels, and healthy eating. They also displayed a higher reduction in body mass index, weight, fasting blood sugar, and blood pressure

Nurses' Knowledge of Diabetes

Nurses have the same responsibility in providing care to diabetic patients, whether in an inpatient or outpatient care setting. Ahmed, Jabbar, Zuberi, Islam, and Shamim (2010) conducted

a study to assess the diabetes knowledge of nurses and resident trainees. The aim was to examine their knowledge on outpatient and inpatient aspects of diabetes care management. Another aim was to identify areas of deficiency that would require educational reinforcement. Ahmed et al. found that registered nurses had a deficit in both outpatient and inpatient knowledge of diabetes. Carney, Stein, and Quinlan (2013) showed the need to enhance the nutritional knowledge of both nursing students and nurses regarding diabetes management. Nurses are not registered dieticians, but basic knowledge of diabetes nutrition should be provided and maintained by nurses caring for patients with diabetes.

Chan and Zang (2007) conducted a study to examine nurses' perceived and actual knowledge level of diabetes. A total of 245 nurses completed a structured questionnaire measuring nurses' experience, perception of diabetes, and diabetes knowledge. Chan and Zang noted the importance of adapting programs to meet the educational needs of specific nursing professionals such as health care providers, especially nurses, and primary care clinic staff must be knowledgeable about current evidence-based practices and resources to provide competent, effective, and culturally sensitive education in the prevention and management of type 2 diabetes

Theoretical Framework

The theoretical framework for this EBP project was the chronic care model (CCM). The CCM was developed by Wagner in 2001 as a guide for the management of chronic illness (Coleman, Austin, Brach, & Wagner, 2009). The chronic care model "uses a systematic approach to restructuring medical care to create partnerships between health systems and communities" (Stellefson, Dipnarine, & Stopka, 2013, p. 1). The CCM has been designed to build on the interrelationships between six evidence-based pillars that lead to improved clinical quality and outcomes in regards to disease management. The CCM has also improved care in health systems

at the community level, health care organization level, primary care/practice level, as well as the patient level (Wagner et al., 2012).

The six pillars are as follows: (a) health care system/organization, which creates a culture to promote safe high quality care; (b) delivery system design, which ensures efficient clinical care and self-management support; (c) decision support, which fosters clinical care with consistent scientific evidence and patient preferences; (d) clinical information systems that facilitate access to patient and population data, which cultivates improvement of efficiency and effective patient care; (e) community resources and policies, which activate various resources to meet patients' needs; and (f) self-management support, which is essential to empower patients with chronic disease to manage their health care needs (Zhang, Van Leuven, & Neidlinger, 2012).

The CCM has been used for diabetes care in U. S. primary care settings with positive patient outcomes such as decreased HBG A1C levels (Stellefson et al., 2013). The CCM was applied to this EBP project for diabetes care and group medical visits using every pillar of the model. The six pillars of the CCM, as applied to group medical visits in type 2 diabetes patients in this study, are discussed in the following sections.

Pillar 1

Health care system organizations identifies the methods that have been used to improve quality and access to care. The advanced practice nurse (APN) provides leadership and education on diabetes through joined patients' appointments to build confidence in the patients' understanding of the disease process. A priority for the APN is to intervene with patients at risk for developing type 2 diabetes complications by providing education to improve clinical as well as behavioral outcomes. According to Stellefson et al. (2013), a systematic review indicated that health care systems in support of the CCM approach found positive benefits associated with

HGB A1C reductions of at least 1% during a 12-month period, as well as improved foot care. Stellefson et al. found positive changes associated with improved blood pressure, cholesterol levels, weight reduction, and body mass index (BMI).

Pillar 2

Delivery system design is intended to facilitate skill-based learning for the diabetic patient by use of group medical appointment, glycerin and home A1C monitoring, education on nutrition, lifestyle changes, and patient empowerment. This step involves coordination of care, which includes recommendations for eye care, nutritional counseling, and follow-up recommendations. During this pillar, each patient is encouraged to take control of his or her diabetes and learns self-management skills. The American Diabetic Association (2013) recommends health care delivery that provides optimal care of diabetes by prevention and management of complications. This has been accomplished by addressing barriers to care such as lack of knowledge and awareness of services available for diabetics (Stellefson et al., 2013).

Pillar 3

Decision support provides guidance for implementing evidence-based care. This pillar includes (a) education on risk factors, (b) regular follow-up with primary care providers, and (c) information about risk factors and identifying barriers (Stellefson et al., 2013). The "training PCPs on evidence-based guidelines and methods for implementing CCM resulted in improved PCP adherence to clinical guidelines. This include also adherence to the American Diabetes Association (ADA) Standards of Care and Institute for Clinical Systems Improvement (ICSI) Clinical Guidelines for Diabetes, Hypertension, and Hyperlipidemia" (Stellefson et al., 2013). The project leader assists in the integration of evidence-based guidelines into clinical practice.

Pillar 4

 Clinical information systems consist of tracking progress through reporting outcomes to patients and providers. This pillar will be accomplished by reviewing hemoglobin A1C levels before the start of each group's diabetic education sessions and at the follow-up visit three months later for comparison. The family practice setting, where the group diabetic education sessions have planned to adopt electronic medical records (EMR) that will provide the access to retrieve stored data on laboratory results, previous visits, medications, health insurance, as well as co-morbid conditions. According to Stellefson et al. (2013), clinical information systems using disease registries and EMR help "patients and providers set self-management goals and review progress reports to determine whether patients met their predetermined goals."

Pillar 5

 Community resources and policy include a variety of services and resources that are available within an organization. Increasing access to effective services in the community with relevant agencies are cost-effective ways to obtain important services such as nutritional counseling or peer support groups (Stellefson et al., 2013). Education during this EBP project will provide to patients about community-based resources available such as eye care, foot care, and patient assistance programs that are essential for the diabetic patient.

Pillar 6

 Self-management support is the last pillar in the CCM. The evidence has shifted the focus from didactic patient education to encouragement and support through effective self-management. Evidence indicates that individual and group interventions that emphasize patient empowerment and the acquisition of self-management skills are effective in diabetes care (Wagner et al., 2012). Education during a group diabetic education addressed a variety of topics, such as medication compliance, important of diet and exercise, foot care, prevention of

complication, interpretation of laboratory results and goal setting. Review of literature found that diabetes self-management education was generally improved psychosocial and clinical outcomes in patients with prediabetes, diabetes and disease progression (Stellefson et al., 2013).

<div align="center">**Strengths and Limitations of the Chronic Care Model and GMAs**</div>

The CCM is an evidence-based guideline and a synthesis of system changes to guide quality improvement (Wagner et al., 2012). Patients that participate in a GMA guided by the CCM for disease management are more likely to receive patient-centered, patient-structured, and quality collaborative care (Szecsenyi, Rosemann, Joos, Peters-Klimm, & Miksch, 2008). Strengths of the CCM and GMAs include several major elements: (1) effective delivery of care; (2) facilitation of self-management of care; (3) evidence-based tools and techniques of providing care, while controlling costs and allocating resources; and (4) system for improving the quality of care for individual patients and populations (Kirsh & Aron, 2008). Limitations may be that the CCM has only been utilized in health care since 2001, compared to other theoretical models that have been utilized and tested for decades.

A limitation of the GMA model is that patients may not feel confident to speak freely and honestly in regards to personal health and lifestyle practices. According to Coleman et al. (2009), evidence suggests that "some type of external incentive and quality improvement support may be essential for widespread practice change" (p.80). In the next decade, the impact of chronic illnesses on health care and health care cost will drive the health care system to explore strategies such as the use of GMAs and CCM to improve patient satisfaction and improve patient outcome scores. The CCM has provided guidance in regards to chronic illness such as diabetes as well as a systematic approach to improving care (Wagner et al., 2012).

Summary

The literature review has indicated that type 2 diabetes can be prevented and managed with lifestyle modification. The problem with type 2 diabetes prevention and management has been attributed to a knowledge deficit on prevention and management for the population with pre-diabetes and type 2 diabetes. Patients that participate in a GMA guided by the CCM for disease management are more likely to receive patient-centered, patient-structured, and quality collaborative care (Szecsenyi, Rosemann, Joos, Peters-Klimm, & Miksch, 2008). In Section 3, the projects design and method will be discussed as well as the target population, intervention outline, and evaluation plans.

Section 3: Collection and Analysis of Evidence

The main purpose of this DNP project was to develop an implementation and evaluation plan outlining a type 2 diabetes prevention and management program in a primary care clinic setting. This section presents the design and method, practice-focused question, sources of evidence, target population, intervention outline, and evaluation plans.

Practice -Focused Question

The practice-focused question for this evidence-based practice project was the following: Among primary care clinic nurses and clinicians caring for prediabetic and type 2 diabetic patients, will an educational module based on the group medical appointment decrease hemoglobin A1C and promote the implementation of a type 2 diabetes prevention and management program in a primary care clinic setting?

Project Design/Method

The evidence-based project consisted of developing an implementation and evaluation plan outlining the process for applying a GMA model to deliver behavioral modification education for prediabetes and type 2 diabetes patients and monitoring their health status in an outpatient primary care clinic in Southern California. A needs assessment conducted in the targeted primary care clinic in 2014 revealed (a) a high number of patients with prediabetes who converted to type 2 diabetes and (b) type 2 diabetes patients with high levels of Hemoglobin A1C. The primary care clinic had no specific intervention or practice protocol aimed at decreasing type 2 diabetes or decreasing the hemoglobin A1C in adult patients with type 2 diabetes. A discussion with the medical director of the clinic revealed the need to develop an implementation and evaluation plan for type 2 diabetes prevention and management programs. Flyers were posted to recruit staff who were involved in caring for prediabetics and diabetes

patients in the primary care setting to get their opinion because they would be the ones implementing it. I presented the prevention and management of type 2 diabetes plan to the primary care staff who consented to the study. HIPPA and NIH guidelines were strictly followed. The staff who consented to the presentation (nine female and one male) were asked to respond to open-ended questions one week later, evaluating the content of the educational program, the viability of implementing the program, and the suitability of the proposed evaluation methods. The analysis of the data from the 10 clinical staff members was used to answer the research question and develop the evidence-based practice. I and the primary care clinic administration and staff reviewed the plan for this program. The primary care clinic will implement this program at a later time.

The short-term goal was to decrease the number of patients who convert from prediabetes to type 2 diabetes and to decrease the hemoglobin A1C levels in adult patients with type 2 diabetes, thereby decreasing diabetic complications. The long-term goal was the sustainability of the new model. The intervention will include an educational module that will be delivered within a GMA model. The primary care clinic nurses will also use the project material when educating patients with prediabetes and type 2 diabetes in the clinic.

Sources of Evidence

The initial step in planning the implementation of the educational intervention within the GMA model included the gathering of resources necessary for the planning of the program. The resources consisted of a DNP student who planned the project; the site for the implementation, which was the primary care clinic; and the administrators and staff of the primary care clinic who reviewed the plan and provided input for implementing the plan in the primary care setting. The resources also included classroom handouts, technology, teaching aids, and nurses. I was responsible for the step-by-step planning of the implementation, including the evaluation plan.

The clinic staff will use the plan in the implementation of the program in a primary care clinic setting. Having the primary care clinic staff organize a team to facilitate the project during the implementation phase was part of the project plan.

The team consisted of three members of the primary care clinic who will oversee the implementation and evaluation of the program. The suitability of the project depended on the team leader. The team leader was responsible for proving support to team members, maintaining a positive atmosphere, and maintaining a positive relationship among members when the goal of the project was challenged (Zaccagnini & White, 2012). The tasks were shared among the team members; two team members were responsible for organizing the team and project, and another person was responsible for educating the providers about the areas that were taught, including diabetic handouts, resources, script, the pre and post surveys with educational in-service for the providers and participants, and maintenance of HIPPA guidelines. All team members participated in the evaluation program.

Data collection during the implementation phase will include each patient's height, weight, BMI, blood pressure, a pre- and posttest survey on lifestyle modifications, as well as most recent laboratory results, specifically HGB A1C levels. The initial GMA took place after chart review had been completed by the project team leader.

I established an outline for the educational intervention, which will cover a 6-week period of weekly sections. The topic selection will be provided to the participants. Participants will return 3 months later to have their hemoglobin A1C level, blood pressure, fasting lipids panel, and medication compliance checked.

Target Population

The evidence-based DNP project was conducted in a family practice clinic that opened 15 years ago and is located in the southern area of a large city in California. The clinic focuses

on family practice and serves an underserved population of all ages. The primary care clinic serves approximately 3,150 patients annually, of which 8% are diabetic patients. The staff include two physicians, four nurse practitioners, two registered nurses, five medical assistants, two licensed vocational nurses, a secretary, and a laboratory technician. The clinic provides care to a mostly African American and Hispanic American population of low socioeconomic status who are suffering from diabetes, lung diseases, heart diseases, and other minor diseases. A variety of services is provided at this primary care practice including physical assessment, routine medical care, outpatient laboratory services, and wellness care.

The implementation and evaluation plan outlined in this project was designed for adult patients from 21to 80 years of age. This project was created in response to the desire to improve patient outcomes for prediabetics and to reduce HGB A1C levels in type 2 diabetic patients in the clinic. The team for the DNP project included the administrators and health care professionals and ancillary staff working in the primary care clinic office because they were responsible for the implementation of the program. The health care professional staff in the clinic was responsible for educating the group that included a nurse practitioner (NP), registered nurses (RN), licensed vocational nurses (LVN), and medical assistants who received education regarding prediabetes, diabetes, and diabetes prevention.

Intervention Outline

The planning of the implementation of the intervention in the primary care clinic required the cooperation of the stakeholders and medical director of the clinic. A meeting was scheduled with me, the medical director, and key stakeholders to discuss the goals and objectives of the project and the use of the clinic as the project planning site. Clinic staff were notified of the project by the flyer and face-to-face meetings. I presented the prevention and management of type 2 diabetes plan to the medical staff who consented to the study at the clinic. I asked them to

respond to open-ended questions evaluating the content of the educational program, viability of implementing the educational program, and suitability of proposed evaluation methods of the plan. The involvement of the clinic staff early in the process minimized the organizational restraint, promoted buy in, ensured cooperation, and improved motivation during the implementation phase.

Any researcher who requires data collection from human beings including those conducting needs assessments and evaluation will need to apply for permission to proceed (Hodges & Videto, 2011). Participants' confidentiality and privacy were protected during the planning of the implementation of the project. The clinic had its institutional review board (IRB); however, the clinic administrator preferred Walden's IRB. This project was submitted to Walden's IRB for their review and was approved. The IRB practical number for this project is 2016.07.2116:21:50-05'00'.

<div align="center">**Project Evaluation Plan**</div>

I planned an evaluation method that the primary care clinic nurses would use to determine the effectiveness of the type 2 diabetes prevention and management program. The team was formed in the evaluation process and included the staff in the primary care setting. The evaluation team will oversee the evaluation process and ensure that the program planning and implementation aligns with program goals and objectives. The evaluation plan included both formative and impact evaluation. The formative evaluation involved the collection of information about activities, characteristics, and outcome of the program. The evaluation team will use formative evaluation to determine whether the intervention met the set goals and objectives, whether the GMA were appropriate for the program, and whether the timing of the intervention was acceptable and convenient for the target population.

The team will also conduct impact evaluation to measure the extent to which the project caused the intended short-term goal by (a) decreasing the number of patients in the primary care clinical setting who converted from prediabetics to type 2 diabetes and (b) decreasing the number of type 2 diabetic patients in the medical office clinical setting who had high hemoglobin A1C levels. The impact evaluation method included a questionnaire to evaluate the attitudes of nurses and patients toward the program. The method also included a designated clinic staff member who performed a chart review to evaluate the number of patients who progressed from prediabetes to type 2 diabetes and type 2 diabetes patients who had diabetic complications.

Summary

The best approach to diabetes care is prevention, but with the overwhelming numbers of diabetic patients in the United States, health care providers need to find new and innovative ways to address the burdens of diabetes complications and outcomes. Primary care clinics and health care professionals play a role in disease prevention by motivating, educating, and providing feedback to individuals at risk for type 2 diabetes. The fight against diabetes requires a comprehensive approach that not only addresses the management of diabetes but also the factors leading to diabetes. The alignment of educational design and diabetes research is the key for health care providers to progress in treatment strategies and eventually the prevention of diabetic complications. Education through GMAs is one way to bridge the gap in regards to diabetic prevention and care that improves efficiency to provider and team behavior, supports patient behavior change, and fosters change in the system of care (ADA, 2013). This section of the project proposal addressed the design and method, the target population, intervention outline, and evaluation plans. In Section 4, I present the findings and recommendations.

Section 4: Findings and Recommendations

The purpose of this DNP project was to plan the implementation and evaluation of a type 2 diabetes prevention and management program in a primary care clinic setting. The project objectives were to (a) plan the delivery of the educational intervention on type 2 diabetes prevention and (b) plan the evaluation method of the educational intervention. The DNP project was designed for a primary care clinic staff to implement with a population of prediabetes and type 2 diabetes patients who visit the clinic. The clinic is located in the southern area of a city in California and provides care to mostly African Americans and Hispanics in a low socioeconomic group. The goal of the type 2 diabetes prevention and management program was to (a) decrease hemoglobin A1c levels, (2) reduce the number of patients who will convert from to prediabetes to type 2 diabetes, and (3) decrease complications of type 2 diabetic patients.

Findings and Implications

Staff Evaluation of Educational Program

The project began with a meeting that was held in the primary care clinic. The people present at the meeting were the clinic medical director, nurses, and me. During the meeting, I elaborated on the plan to design a type 2 diabetes prevention and management program in the primary care clinic and discussed how the program would benefit the population with prediabetes, family members or friends of those with prediabetes, and type 2 diabetics and how it would improve health outcomes. A team was formed that included a staff in the primary care clinic and me.

My presentation of the plan to the clinical staff who care for the prediabetes and type 2 diabetes patients in a primary care setting was also discussed during this meeting. This was to get the opinion of the primary care staff who were involved in diabetic care because they would be

implementing the education program. A team was formed that included a registered nurse in the primary care clinic and me. Approval was received from the clinic stakeholders and Walden University's IRB to proceed with the planning of the educational program and presentation of the educational program plan to the primary care staff.

Upon approval of the project, a flyer was posted to recruit staff who are involved in caring for prediabetics and diabetes patients in a primary care setting. The staff included nine females and one male. I presented the prevention and management of type 2 diabetes outline to the primary care staff who consented to the study. The presentation took place in the primary care clinic setting and lasted for 30 minutes. The primary care staff listened to the presentation of the educational program about type 2 diabetes prevention and management, describing the implementation and evaluation of a group medical appointment.

One week later, participants responded to open-ended questions about the educational program and components of the implementation and evaluation plan. Textual responses from clinical staff are summarized below:

1. Do you think that the content of the educational program on prevention and management of type 2 diabetes is appropriate? Staff expressed that the educational program would have a positive influence on patient health outcomes.

2. Do you think that the evaluation method for the educational program on prevention and management of type 2 diabetes is appropriate? Staff felt that the proposed evaluation methods were appropriate.

3. Do you think that this educational program on prevention and management of type 2 diabetes can be possibility implemented? Staff felt the educational program could realistically be implemented.

4. Can a diabetic educational program using group medical appointment reduce the increase in diabetes prevalence and complications? Please explain. Staff unanimously agreed that a diabetic educational program using group medical appointment could reduce the increase in diabetes prevalence and complications.

5. Do you think this project will lead to the integration of a type 2 diabetes prevention program and a type 2 diabetes management program in a primary care clinic? Please explain. Staff expressed that this project would lead to the integration of a type 2 diabetes prevention program and a type 2 diabetes management program in a primary care setting.

6. Do you think that this project will improve the quality of care and patient outcome on prediabetes and type 2 diabetes patients at the primary care clinical setting? Please explain. Staff expressed that this project would improve the quality of care and outcomes of prediabetes and type 2 diabetes patients at the primary care clinical setting.

7. What are the roles of staff in educating prediabetes and type 2 diabetes patients? Staff unanimously answered that the roles of staff in educating prediabetes and type 2 diabetes patients includes educating, motivating and providing feedback to individuals at risk for type 2 diabetes and patients already with type 2 diabetes

8. Do you think that the educational program for prediabetes and type 2 diabetes within GMA in a primary care clinical setting will have an positive influence on patient health outcomes? Staff expressed that the educational program would have a positive influence on patient health outcomes.

9. Do you think that prevention and management educational programs using group medical appointment (GMA) could decrease HbA1c, prevent more development of type 2 diabetes, and improve management of type 2 diabetes? Staff unanimously stated that prevention

and management educational programs using GMA could decrease HbA1c, prevent more development of type 2 diabetes, and improve management of type 2 diabetes.

10. Do you think that type 2 diabetes can be prevented and properly managed through the educational program within the GMA in a primary care office setting? Staff unanimously agreed that type 2 diabetes could be prevented and properly managed through the educational program within the GMA. Staff also unanimously agreed that the program within the GMA in a primary care office setting could promote healthy eating, support lowering body weight, and increase physical activity.

Components of Educational Program Using GMA

The researcher has designed a binder that contains the material required for the step-by-step implementation and evaluation of the type 2 diabetes prevention and management program in the primary care setting.

Binder Contents Outline

Appendix A: Program Outline that contained educational materials from Week one session to week six session,

Appendix B: Participation Demographic Form

Appendix C: Appendix C: Pretest / Posttest for Each Section

Appendix D: Evaluation Form for Each Session on Lecture,

Appendix E: Evaluation Form for Each Session on staff

Appendix F: Handout materials

Appendix G: Pamphlet materials

Process for Implementing the Educational Program

The participants will meet 90 minutes a day once a week for 6 weeks, and each meeting will last 90 minutes. During the initial visit, an assessment of height, weight, medical history, and family history will be completed for patients with prediabetes and type 2 diabetes. A pretest will be given to assess baseline knowledge of diabetes and diabetes prevention. The participants will take the same test as the posttest to evaluate whether the program enhanced diabetes and diabetes prevention and management knowledge. Six months after the implementation of the program, nurses will complete a chart review to evaluate how many patients (a) had a decrease in hemoglobin A1C levels, (b) converted from prediabetes to type 2 diabetes, and (3) had complications in the primary care office clinic since the implementation of the program.

The program outline was designed to fit each patient's need and knowledge level. The program was also designed to be implemented to an audience of two or more persons. The medical office director agreed to designate a team of two nurses to oversee the diabetes prevention and management program implementation and evaluation. Team member roles included a team leader who would run and direct the program and a facilitator who would assume the role of team leader if the team leader was not available. Although all of the nurses in the primary care clinic received instruction on the project and how to implement the program, the team leader and facilitator were recognized as the diabetes prevention program advocates in the clinic. My contact information was available for questions or assistance during the implementation and evaluation phase.

Implications for Evidence-Based Practice

Nurses and certified nurse educators are trained to provide diabetes education to the population with diabetes or those at risk for diabetes. For this DNP project to be considered successful, it had to be implemented and evaluated by the primary care office clinic nurses. The

10 participants (nine females and one male) attended a meeting that lasted for 30 minutes where they listened to a presentation of the outline plan on an educational program for type 2 diabetes prevention and management within a group medical appointment. One week later, the 10 clinic staff members responded to open-ended questions about the educational program and components of the implementation and evaluation plan. The responses to the questions indicated that they believed the diabetic education program within a GMA setting could enhance type 2 diabetes prevention, improve type 2 diabetes management, and reduce type 2 diabetes complications in a primary care setting.

During the 90 minute GMA, the health care provider will be supported by other professionals in regards to various educational needs to provide routine or follow-up care for groups of patients at one time. GMAs will allow the health care provider and health care team the opportunity to address patient needs outside the confines of shortened one-on-one traditional office visits.

GMAs are an important component of the chronic care model that combines medical care, patient education, and patient empowerment in a primary care office setting. GMAs are interactive, voluntary care delivery systems. GMAs empower patients in addition to being effective and efficient (Szecsenyi et al., 2008). The benefits of GMAs include improving management of busy practices that do not allow time to provide education during routine visits. GMAs promote greater efficiency in health promotion and health outcomes. In GMAs, the health care providers have the opportunity to provide information to a group that might otherwise be delivered in multiple one-on-one appointments. With GMAs, providers have more time for patient visits, which increases patient education and opportunity for patients to ask questions. GMAs help the primary care staff identify potential psychosocial issues and steps for appropriate

follow-up. Additionally, GMAs create peer support and encouragement for other patients in the group (Szecsenyi et al., 2008).

In one study, one third to one half of the population with diabetes had never had formal diabetes education (Maryniuk et al., 2013). This DNP project has the potential to lead to the integration of type 2 diabetes prevention programs in a primary care setting, thereby increasing awareness and education of the population at risk for type 2 diabetes who has not received formal diabetes education. Currently, there is no existing reimbursement model to fund a diabetes prevention program in a medical office clinic (Katula, Blackwell, Rosenberger, & Goff, 2011). The successful implementation of the project may promote a reimbursement policy for diabetes prevention services in a primary care setting. The project may influence nursing practices by making nurses more proactive in the prevention of type 2 diabetes. Outcome data will need to be gathered to evaluate how nurses are using the materials to promote diabetes prevention among the population at risk for type 2 diabetes.

Social Change

The DNP project may influence social change by decreasing the number of patients with prediabetes who convert to type 2 diabetes, decreasing hemoglobin A1c levels, decreasing complications of people who already have type 2 diabetes, and reducing the prevalence of diabetes among the population. This project may reduce the burden of diabetics on families and communities. Additionally, it has the potential of reducing the amount of money spent on diabetic treatment annually.

Strengths

The program was designed using culture-specific resources that were appropriate for the medical office clinic setting. The program champions were enthusiastic about the type 2 diabetes prevention and management program. The program can be implemented to either an individual

patient or a group of patients. The program was designed to be suitable for individuals with different learning styles, and patients can proceed with the program based on their needs and knowledge level. A strength of the program was the use of a single-group pretest/posttest design to evaluate knowledge. The single-group pretest/posttest design provides evidence that makes it possible to estimate the impact of a program on participants.

Limitations

One limitation was that the program required resources that were not available at the primary care office clinic. Currently, there is no existing reimbursement model to fund a diabetes prevention and management program in a medical office clinic (Katula et al., 2011). According to the medical director, the clinic will need resources such as physical space to conduct the education and extra time for nurses to provide the education to the population. Another limitation was the use of a single-group pretest/posttest to evaluate knowledge. Although there are benefits of the single-group pretest/posttest, I could not be certain that the observed change in behavior or knowledge between the pretest and the posttest were the result of the intervention from this type 2 diabetes prevention and management program. Other confounding factors may have affected the participants or the program.

Recommendations

One recommendation for improvement for future evidence-based projects is the consideration of reimbursement policies when planning the implementation and evaluation of a type 2 diabetes prevention and management program in a primary clinic. According to Kabuli et al. (2011), the Centers for Medicare & Medicaid Services (CMS) and National Diabetes Prevention Program (NDPP) are developing strategic plans that will enhance reimbursement policy for diabetes prevention services. Future researchers should investigate the criteria and process for obtaining certification from NDPP for reimbursement during the implementation of the program. Adequate

funding will promote the implementation and evaluation of the program by the primary care office clinic.

Section 5: Dissemination Plan

There is clear and compelling evidence from many countries that diabetes and its complications can be significantly delayed or prevented through simple, cost-effective intervention (International Diabetes Federation, 2010). The inadequate control of diabetes continues despite advances in technology, diagnosis, and treatment (Nam et al., 2011). Poor control of diabetes is a result of the failure of adequate intervention by health care professionals and inadequate management by patients. Nurses with a DNP may propose evidence-based practice changes that will reduce the cost of diabetes and improve documentation, quality of life, and health care outcomes. This project introduced an evidence-based project that was conducted in a primary care office clinic. The discussion included the background, purpose, and nature of this DNP project, project design and setting, presentation of results, interpretation of findings, implications for the evidence-based practice of the project, and evaluation.

Dissemination of nursing knowledge is essential for the health care system. Being able to contribute effectively and communicate knowledge to primary care staff, nurses, interdisciplinary colleagues, policymakers and the public via publications is vital. Additionally, journal clubs, presentations, panel memberships, posters, and media interviews are crucial for the health care profession. For this project, dissemination will be conducted during the primary care staff meeting. This project will be presented in a PowerPoint presentation to communicate and collaborate with clinical staff as well as health care professionals to improve patient outcomes through EBP. Dissemination will also include a poster presentation using a three-panel poster. Panel 1 will contain the background, problem, and purpose; Panel 2 will contain the outline of

the educational program on prevention and management of type 2 diabetes within a GMA; and Panel 3 will contain the findings and implications.

Analysis of Self

The DNP capstone project, the final requirement for the student in the DNP program, provides the foundation for future scholarship (American Association of College of Nursing [AACN], 2006). The DNP capstone project completion signifies that the student has mastered knowledge and proficiency in the field. The DNP program provides the education that helps a person reach his or her potential, become a better leader, and be all that he or she can be (Zaccagnini & White, 2012). The DNP program, including the practicum and DNP project experience, has helped me become a leader capable of influencing others to make changes.

Sharing my project outcomes with other clinical staff in various health care settings allows me to contribute significantly to new knowledge on diabetes education in clinical practice (Terry, 2012). As a scholar, I am capable of using critical thinking to appraise existing literature and apply knowledge in the solution of a health care problem. I encountered many challenges (writing papers, proofreading, finding the information, knowing the next step, putting things in the right place, and so on) during the development of my DNP project. Despite the challenges, I am a dedicated practitioner interested in identifying gaps in evidence for nursing practice. Developing a plan for type 2 diabetes prevention and management has demonstrated my capacity to function as a project manager, exposing me to some projects that require leadership roles in directing, motivating, and influencing others to accomplish a mission and improve an organization. This project outcomes indicated the need to evaluate care delivery approaches that meet current and future needs of this specific population (Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking) (AACN, 2006).

Challenges, Solutions, and Insights Gained

Diabetes threatens the health of many people living in the United States. The American Diabetes Association (ADA, 2011) and Centers for Disease Control and Prevention (CDC, 2008) have implemented numerous educational materials and activities to help decrease the prevalence and incidence of type 2 diabetes. Diabetes is still a significant health problem and is the seventh leading cause of death in the United States (Healthy People 2020, 2011). According to Healthy People 2020 (2011), there is an estimated 15-year reduction in lifespan that is attributed to diabetes. People with diabetes are more prone to developing "heart disease, stroke, blindness, kidney failure, and lower-limb amputations" (CDC, 2014, p. 5). The CDC (2014) reported that in 2012, the total diabetes cost (direct and indirect) in the United States was $245 billion. The direct medical expenses of $176 billion were 2.3 times more than the population without diabetes, and the indirect cost from work loss, disability, and death was $69 billion (CDC, 2014). The challenge of diabetes prevention and management is to reduce the financial and human costs of diabetes through prevention of new cases and social change.

African Americans and Hispanic Americans have a high incidence of type 2 diabetes because of factors that place them at risk for prediabetes. According to CDC (2014), in 2012 29.1 million people in the United States of all ages had diagnosed (21.0 million) or undiagnosed (8.1 million) diabetes, and among this population 28.9 million were 20 years old or older. When separated by age, 4.3 million were 20 to 44 years old, 13.4 million were 45 to 65 years-old, and 11.2 million were 65 years or older (CDC, 2014). The CDC also reported that the number of men among the population was 15.5 million while women were 13.4 million. Newly diagnosed diabetes in 2012 for adults 20 years and older was 1.7 million. Among this population, 371,000 were 20to 44 years old; 892,000 were 45 to 64 years old; and 400,000 were 65 years old or older (CDC, 2014). The CDC (2014) reported the differences in diagnosing rates by race and ethnicity

from 2010 to 2012, which included European Americas at 7.6%, Asian Americans at 9.0%; Hispanic Americans at 12.8%, African Americans at 13.2%, and Native Americans at 15.9%. The increase in the number of individuals with diabetes from 2010 to 2012 is an indication that diabetes is a health care problem that requires attention.

Lifestyle modification with weight control, moderate exercise, and dietary changes can decrease type 2 diabetes. Lifestyle modification is more effective and has more of a prolonged impact in type 2 diabetes prevention than drug treatment (Gillies et al., 2007). The challenge with type 2 diabetes prevention is the transfer of the research findings on lifestyle modifications into real-world practice. Jansink et al. (2010) showed that patients have limited insight into their behavior, healthy lifestyle knowledge, and lack of motivation to modify or sustain a better lifestyle. Jansink et al. concluded that nurses report insufficient time and lack of counseling as barriers in effective lifestyle counseling in diabetes care. Intensive lifestyle intervention produces beneficial changes in physical activity, diet, biomedical and clinical parameters, and reduced risk for diabetes (Lindstrom et al., 2003). Nilsen et al. (2011) conducted a study that involved 213 participants at risk for type 2 diabetes to examine the effect of lifestyle intervention on individuals at risk for type 2 diabetes and concluded that modest clinical efforts can lead to lifestyle changes in these patients. Lifestyle intervention can promote patient outcome in individual at risk for type 2 diabetes.

Lifestyle intervention in a structured environment plays an important role in helping patients achieve lifestyle changes. Moore et al. (2011) conducted a randomized control trial to evaluate the effectiveness of a 6-month group-based diabetes prevention program on a population at risk for prediabetes. The aim was to examine whether taking part in the program contributed to changes in modification risk factors for type 2 diabetes. The intervention group

improved their motivation to change, diabetes knowledge, activity levels, and healthy eating. Participants also displayed a higher reduction in body mass index, weight, fasting blood sugar, and blood pressure. Render et al. (2000) conducted a study on interventions to improve diabetes management in the outpatient, primary care, and community settings. Professional intervention, organizational intervention, and intervention with patient education improved process outcomes (Render et al, 2000). Enhanced nursing role and intervention with patient education will result in desired patient health outcome.

Health care facilities depend on nurses to provide diabetes education to prediabetics and type 2 diabetics. However, nurses have limited knowledge and understanding when providing care for patients with diabetes (Young, 2011). Chan and Zang (2006) conducted a study to examine nurses's perceived and actual knowledge of diabetes. A total of 245 nurses completed a structured questionnaire measuring their experience, perception of diabetes, and diabetes knowledge. Chan and Zang found the importance of adapting programs to meet the educational needs of specific nursing professionals such as psychiatric nurses. Health care providers, especially nurses, must be knowledgeable about current evidence-based practices and resources to provide competent, effective, and culturally sensitive education in the prevention and management of type 2 diabetes in primary care clinics. In addition to lifestyle modification and nurses' diabetes knowledge, belief and attitude influence diabetes prevention and management. Nam et al. (2011) discovered that multiple factors affect a patient's self-management of diabetes. Some of the factors include a patient's adherence, beliefs, attitudes, knowledge about diabetes, language and cultural competencies, financial resources, social support, and comorbidity. The clinical factors that influence a patient's diabetes management and perception include belief, attitude, knowledge, communication skills, and the presence of a well-integrated care system

(Nam et al., 2011). Lack of insight regarding the cause and treatment of diabetes contributes to inadequate health outcomes.

The accurate projection of diabetes cost and health care burden is important for the future planning of health care programs. Boyle et al. (2010) conducted a study on the projection of the burden of diabetes among the U. S. adult population in the year 2050. Boyle et al. found an increase in the incidence of diabetes from eight cases per 1000 in 2008 to an estimated 15 cases per 1000 in 2050. The prevalence of diabetes will increase from 14% to 21% in 2010 and mortality prevalence will increase to 33% in 2050 (Boyle et al. 2010). Boyle et al. concluded that effective preventive interventions focused on high-risk populations can reduce future increases in the prevalence of diabetes. Lifestyle intervention can reduce the increase in diabetes prevalence.

The purpose of this DNP project was to plan the implementation and evaluation of a type 2 diabetes prevention and management program in a primary care office clinic. The project objectives were to (a) plan a delivery of the educational intervention on type 2 prevention and management and (b) plan the evaluation method of the educational intervention. The goal of the type 2 diabetes prevention and management program was to reduce the number of patients who convert from prediabetes to type 2 diabetes and to reduce complications in patients who already have type 2 diabetes.

Project Design and Setting

The evidence-based DNP project will be conducted in the primary care clinic in Southern California that was opened 15 years ago. The clinic specializes in the care of children, adults, and geriatrics. In a needs assessment of the primary care clinic in 2015, I found that a high number of patients with prediabetes converted to type 2 diabetes and a high number with type 2 diabetes experienced complications. The primary care office setting had no intervention or practice protocol that was aimed at decreasing type 2 diabetes and management of patients who

already had type 2 diabetes. A discussion with the medical director of the clinic resulted in the need to plan the implementation and evaluation of a ype 2 diabetes prevention and management program in the primary care clinic. The intervention will be an educational module. The intervention will span a 6-week period of weekly sessions. Each session will last 90 minutes. The 90-minute educational material will be delivered via a face-to-face interaction in the classroom. The interaction will include discussion, videos, and handouts on type 2 diabetes prevention and management. The materials will be provided to participants along with additional recourses on how to receive educational materials on the Internet.

The target population for the DNP project will be nurses working in the primary care clinic because they will be responsible for the implementation of the program. The nurses will include a nurse practitioner (NP), registered nurses (RN), and licensed vocational nurses (LVN). Selected nurses have received some form of education in the past regarding prediabetes, diabetes, and diabetes prevention. The primary care clinic nurses will implement and evaluate the program. The primary care clinic nurses will also use the project material when educating the patients with prediabetes and patients who have type 2 diabetes.

The project began with a meeting that was held in the primary care clinic setting. The people present at the meeting were the clinic medical director, nurses, and me. During the meeting, I elaborated on the plan to design a type 2 diabetes prevention and management program in the clinic. I discussed how the program would benefit the population with prediabetes and type 2 diabetes, family members or friends of those with prediabetes and type 2 diabetes, and health outcomes.

Presentation of Results

Upon approval of the DNP project, a flyer was posted to recruit staff who are involved in caring for prediabetics and diabetes patients in a primary care setting. A total of 10 staff

consented to participate in the study. The 10 staff who consented include nine females and one male.

I used the materials and information from the American Diabetes Association to design a binder that contained the material required for the step-by-step implementation and evaluation of the type 2 diabetes prevention and management program at the primary care clinic. The binder contained a program outline (Appendix A), participant demographic form (Appendix B), pretest for each sections (Appendix C), p proposal 2016.07.2 116:21:50-05'00'osttest for each section (Appendix D), presentation materials including pamphlets and handouts (Appendix E), and an evaluation form (Appendix E). The participants were to meet 90 minutes a day, once a week for 6 weeks. During the initial visit, an assessment of prediabetes, height, weight, medical history, and family history will be completed. A pretest will be given to assess baseline knowledge of diabetes and diabetes prevention and management. The participants will take the same test as a posttest to evaluate whether the program enhanced diabetes and diabetes prevention knowledge. Six months after the implementation of the program, nurses will complete a chart review to evaluate how many patients converted from prediabetes to type 2 diabetes in the primary office clinic since the implementation of the program.

The medical director of the primary care clinic made time available to discuss the feasibility of the project plan. The program was designed using culture-specific resources that were appropriate for the primary care clinic. A team was formed that included a registered nurse in the clinic and me. I received approval from the clinic stakeholders and Walden IRB to proceed with the planning of the educational program. The chronic care model (CCM) provided the theoretical framework for the study. The program champions were enthusiastic about the type 2 diabetes prevention and management program within group medical appointment. The program

can be delivered to groups of two or more patients. The program was designed to be suitable for individuals with different learning styles, and patients can proceed with the program based on their needs and knowledge level.

A strength of the educational program was the use of a single-group pretest/posttest design to evaluate knowledge. The single-group pretest/posttest design provides counterfactual that makes it possible to estimate the impact of a program on participants. One limitation is that the program will require resources that are not available at the medical office clinic. Currently, there is no existing reimbursement model to fund a diabetes prevention program in a medical office clinic (Katula et al., 2011). According to the medical director, the medical clinic will need resources such as physical space to conduct the education and time for nurses to provide the education to the population. Another limitation is the use of a single-group pretest/posttest to evaluate knowledge. I cannot be certain that the observed change in behavior or knowledge between the pretest and the posttest are the result of the intervention from this type 2 diabetes prevention program. Other confounding factors may have affected the participants or the program. One recommendation for improvement for future evidence-based projects is the consideration of reimbursement policies when planning the implementation and evaluation of a type 2 diabetes prevention and management program in a primary care office clinic. According to Katula et al. (2011), the Center for Medicare and Medicaid Services (CMS) and National Diabetes Prevention Program (NDPP) are developing strategic plans that will enhance reimbursement policy for diabetes prevention services. It is imperative that I investigate the criteria and process of obtaining certification from NDPP for reimbursement during the planning of the program. Adequate funding will promote the implementation and evaluation of the program by the primary care office clinic.

Nurses and certified nurse educators are trained to provide diabetes education to the population with diabetes or at risk for diabetes. In one study, one-third to one-half of the population with diabetes never had formal diabetes education (Maryniuk et al., 2013). This DNP project has the potential to lead to the integration of type 2 diabetes prevention programs in primary care office clinic setting, thereby increasing the population at risk for type 2 diabetes who has received formal diabetes education. Currently, there is no existing reimbursement model to fund a diabetes prevention program in a medical office clinic (Katula, Blackwell, Rosenberger, & Goff, 2011). The successful implementation of the project may promote a reimbursement policy for diabetes prevention services in a primary office clinic. The project, when implemented, will influence nursing practice by making nurses more proactive in the prevention and management of type 2 diabetes. Outcome data will need to be gathered to evaluate how nurses are using the materials to promote diabetes prevention and management among the population at risk for type 2 diabetes. The DNP project will also influence social change by decreasing the number of population with prediabetes who convert to type 2 diabetes and reduce health disparity of diabetes among the population.

I presented the outcome of the project to the stakeholder. The medical director and nurses were present during the presentation. The medical director, nurses, and I discussed the feasibility of the project plans. The nurses at the primary care office were motivated to learn more about the project, and willing to implement the program to improve patient outcomes. The clinic designated a champion to oversee and monitor the progress of the program. The medical director restated that lack of funding will influence the implementation of the project. Unfortunately, the medical director of the clinic had no set schedule on when the program will start.

Summary and Conclusion

Primary care clinic health professionals must be equipped with the materials and knowledge of current evidence-based practices in providing effective diabetes prevention and management education to patients at risk for Type 2 diabetes and those already have Type 2 diabetes. The program developed in this project could be implemented by primary care office clinic staff to improve health outcomes of patients with prediabetes and Type 2 diabetes. The researcher plans to follow-up with the primary care clinic on the status of the program.

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Appendix A: Binder Contents:

Welcome to the educational program on prevention and management of Type 2 diabetes within a Group Medical Appointment (GMA)

☐☐Welcome and Introduction

☐☐Will meet 90 minutes a week for 6 weeks

- Will learn how to prevent and manage type 2 diabetes

- Will learn importance of maintaining 150 minutes a week of moderate physical activity

- Will learn importance of maintaining a healthy diet in a Type 2 diabetic world

☐☐Goal: Decrease HgA1c through healthy eating

- Maintain 150 minutes a week of moderate physical activity

☐☐Goal: Decrease our chances of getting Type 2 diabetes

- Decrease our chance of getting Type 2 diabetic complications

Title: Diabetes Prevention and Management Program Outline for a Primary Care Setting

Program Mission: (1) To promote lifestyle modification behavior to prevent or delay Type 2 diabetes among patients with prediabetes in populations that visit a primary care setting and (2) to decrease Hemoglobin A1c levels in patients who already have Type 2 diabetes, thereby preventing diabetic complications in populations that visit a primary care setting.

Program Goal: (1) To decrease the number of patients that visit the primary care setting that will convert from prediabetes to Type 2 diabetes and (2) to decreases the number of Type 2 diabetes patients that will develop diabetic complications.

Target Audiences: The target audiences that will most benefit from this program include

patients with prediabetes those who have a family history of diabetes, or obese patients who receive care at a primary care setting. The program will also benefit any individuals who have Type 2 diabetes, who are at risk for type 2 diabetes, and those who work with the population with Type 2 diabetes.

Task to be done before starting the sections: Self-study of Program Guide Binder materials to patients, prior to starting the sections.

Methods of Instruction: Presentation, small group discussion, lecture, video/DVD, and independent study on assigned topic.

Length: 90 minutes a week for six weeks.

Learning Objectives: Upon successful completion of this program the participants will be able to:

1. Describe Type 2 diabetes, signs and symptoms, risk factors, and prevention and management of Type 2 diabetes.

2. Demonstrate how to monitor blood sugar levels and be able to state normal and abnormal levels, including Hemoglobin A1c.

3. Demonstrate knowledge about sharps and sharp container disposal.

4. Discuss the significance of preventing or delaying Type 2 diabetes.

5. Discuss the significance of managing Type 2 diabetes and deceasing diabetic complications.

6 Discuss the importance of increasing physical activities.

7. Discuss the importance of the diabetic food pyramid and reducing food portion sizes.

Appendix B: Program Outline

Week 1 Session Outline

Pretest

 What is Diabetes?

 The types of diabetes:

Type 1 diabetes

Type 2 diabetes

Gestationnel diabetes

Questions

Evaluation

Week 2 Session Outline
Complications of Diabetes

1. Cardio-vascular disease

2. Heart disease or stroke

3. Kidney disease or failure

4. Eye disease or blindness

5. Nerve damage

Questions?

Evaluation

Week 3 Session Outline

1. How does insulin work?

2. The role of glucose.

3. What is a hemoglobin A1C level?

4. What does diabetes affect?

5. Aggressive treatment options for diabetes.

Questions?

Evaluation

Week 4 Session Outline

1. Physical activity.

2. Exercise is the 1st step in improving your health.

3. Diabetes – Oral Medications.

4. Diabetes – Insulin.

5. Aggressive treatment in diabetes is key.

Questions?

Evaluation

Week 5 Session Outline

1. How to monitor blood sugar.

2. Why test your blood sugar several times a day.

3. Keeping record of your blood sugar level and the food you eat.

4. Is there a cure for diabetes?

Questions?

Evaluation

Week 6 Session Outline

1. Diabetes is a problem.

2. Careful management of type 2 diabetes can reduce your risk of serious, life-threatening

complications.

4. Reinforce lifestyle modifications.

5. Setting goals.

Questions?

Evaluation

Post-test

Appendix C: Participation Demographic Form

PLEASE DO NOT PUT NAME ON PAPER

1. Today's Date:

2. Gender (circle one):

a) Male

b) Female

3. Marital status (circle one):

a) Married or domestic partner, Widowed

b) Single, never married) Prefer not to answer

c) Divorced or separated

4. What ethnicity do you most identify with? (circle one)

a) Caucasian) Asian

b) Hispanic) Other: Specify

c) Middle Eastern) Prefer not to answer

d) African American

5. What is the highest degree or level of school you have completed? (circle one)

a) No schooling completed Trade school

b) Up to 8th grade) Associate degree

c) Some high school) Bachelor's degree

d) High school graduate or GED Master's degree or higher9

e) Some college) Prefer not to answer

6. Which best describes your current employment status? (circle one)

a) Employed part-time) Military

b) Employed full time) Retired

c) Looking for work) Unable to work

d) Student) Prefer not to answer

e) Homemaker

7. Do you or have you ever lived with anyone with diabetes? (circle one)

a) Yes

b) No

c) Prefer not to answer

8. How would you characterize your level of physical activity at this time? (circle one)

(Note: Baseline activity refers to light intensity activities of daily living such as

standing, walking slowly, and lifting lightweight objects.)

a) Inactive (no activity beyond baseline)

b) Low (activity beyond baseline but fewer than 150 minutes or 2½ hours a week)

c) Medium (150 minutes or 2½ hours to 300 minutes or 5 hours a week)

d) High (more than 300 minutes or 5 hours per week)

9. Have you ever been told that you are pre-diabetic or have a higher than normal

fasting blood sugar? (circle one)

a) Yes

b) No

Appendix D: Pretest /Posttest for Each Section

Pretest /Posttest #1

Date:

1. All of the following are vegetables except:

a. Asparagus

b. Rice

c. Brussels sprouts

d Cabbage

e. Carrots

2. All are early signs and symptoms of hypoglycemia except:

a. Confusion

b. Dizziness

c. Gerd

d. Feeling shaky

e. Hunger

f. Headaches

g. Irritability

h. Pounding heart; racing pulse

3. All are later signs and symptoms of hyperglycemia except:

a. Fruity-smelling breath

b. Low back pain

 c. Nausea and vomiting,

d. Dry mouth

e. Confusion and coma

4. All are early signs and symptoms of hyperglycemia except:

a. Confusion

b. Dizziness

c. Feeling shaky

d. Hunger

e. Headaches

f. Irritability

g. Pounding heart; racing pulse

5. Exercise will decrease your blood sugar:

a. True

b. False

6. Benefits of physical activity include all of the following except:

a. Relieve stress

b. Increase energy for activities

c. Increase blood pressure

d. Promote adequate sleep

7. What is the recommended amount physical activity?

a. 15 minutes of moderate-to-vigorous intensity aerobic exercise at least 3 days a week

b. 40 minutes of moderate-to-vigorous intensity aerobic exercise at least 2 days a week

c. 30 -45 minutes of moderate-to-vigorous intensity aerobic exercise at least 5 days a week

d. 60 minutes of moderate-to-vigorous intensity aerobic exercise at least 1-day a week

8. Stretching exercise will help keep joints flexible, prevent stiffness, and prevent injury during physical activity:

a. True

b. False

9. HbA1c levels include: Normal: HbA1c below 5.7%, Prediabetes: HbA1c 5.7 – 6.4% and Diabetes: HbA1c 6.5% and above:

a. True

b. False

10. Type 2 diabetes can be prevented

a. True

b. False

11. Fasting blood glucose levels: Normal is below 100 mg/dl (milligrams per deciliter)

Prediabetes: between 100 and 125 mg/dl, and Diabetes: 126 mg/dl or above:

a. True

b. False

12. Oral glucose tolerance test (OGTT) levels are measured two hours after drinking the solution:

a. True

b. False

13. Readings for Oral glucose tolerance test (OGTT) include the following: Normal: below 140 mg/dl, Prediabetes : 140-199 mg/dl, and Diabetes: 200 mg/dl or above:

a. True

b. False

14. What is your body weight and height and BMI today?

15. How many minutes of physical activities (exercise) do you do in a day?

Pretest /Posttest #2

CONTROL #_____-01   **DATE_____**

Please tell us *how confident* you feel in performing certain activities. For each of the following questions, please circle the number that best corresponds to how confident you feel about being able to do the task regularly at the present time.

		Not at all confident	Somewhat confident	Neither confident nor unconfident	Very confident	Totally confident
1	How confident are you that you can adhere to a low carbohydrate diet?	1	2	3	4	5
2	How confident are you that you can achieve a healthier weight?	1	2	3	4	5
3	How confident are you that you can monitor your blood sugar?	1	2	3	4	5
4	How confident are you that you can control your blood sugar?	1	2	3	4	5
5	How confident are you that you can prevent or delay the onset of diabetes?	1	2	3	4	5
6	How confident are you that you can achieve a healthier lifestyle?	1	2	3	4	5
7	How confident are you that you can increase your physical activity level?	1	2	3	4	5

Adapted from "Self-efficacy and Health Behaviors Toward the Prevention of Diabetes Among High Risk Individuals Living in Appalachi," by E. Serrano, J. Leiferman, and S. Dauber, 2007, *Journal of Community Health, 32,* 121–135, doi:10.1007/s10900-006- 9034-4

Appendix E: Evaluation Form for Each Session on Lecture

Posttest #1

Date:

1. All of the following are vegetables except:

a. Asparagus

b. Rice

c. Brussels sprouts

d Cabbage

e. Carrots

2. All are early signs and symptoms of hypoglycemia except:

a. Confusion

b. Dizziness

c. Gerd

d. Feeling shaky

e. Hunger

f. Headaches

g. Irritability

h. Pounding heart; racing pulse

3. All are later signs and symptoms of hyperglycemia except:

a. Fruity-smelling breath

b. Low back pain

c. Nausea and vomiting,

d. Dry mouth

e. Confusion and coma

4. All are early signs and symptoms of hyperglycemia except:

a. Confusion

b. Dizziness

c. Feeling shaky

d. Hunger

e. Headaches

f. Irritability

g. Pounding heart; racing pulse

5. Exercise will decrease your blood sugar:

a. True

b. False

6. Benefits of physical activity include all of the following except:

a. Relieve stress

b. Increase energy for activities

c. Increase blood pressure

d. Promote adequate sleep

7. What is the recommended amount physical activity?

a. 15 minutes of moderate-to-vigorous intensity aerobic exercise at least 3 days a week

b. 40 minutes of moderate-to-vigorous intensity aerobic exercise at least 2 days a week

c. 30 -45 minutes of moderate-to-vigorous intensity aerobic exercise at least 5 days a week

d. 60 minutes of moderate-to-vigorous intensity aerobic exercise at least a week

8. Stretching exercise will help keep joints flexible, prevent stiffness, and prevent injury during physical activity:

a. True

b. False

9. HbA1c levels include: Normal, HbA1c below 5.7%; Prediabetes, HbA1c 5.7 – 6.4%; and Diabetes, HbA1c 6.5% and above:

a. True

b. False

10. Type 2 diabetes can be prevented

a. True

b. False

11. Fasting blood glucose levels: Normal is below 100 mg/dl (milligrams per deciliter), Prediabetes is between 100 and 125 mg/dl, and Diabetes is 126 mg/dl or above:

a. True

b. False

12. Oral glucose tolerance test (OGTT) levels are measured two hours after drinking the solution:

a. True

b. False

13. Readings for Oral glucose tolerance test (OGTT) include the following: Normal: below 140 mg/dl, Prediabetes: 140-199 mg/dl, and Diabetes: 200 mg/dl or above:

a. True

b. False

14. What is your body weight and height and BMI today?

15. How many minutes of physical activities (exercise) do you do in a day?

Appendix F: Evaluation Form for Each Session on Staff

Date:

1= Outstanding 2= Above Average 3= Satisfactory

4= Needs improvement 5= Unsatisfactory

I learned new things today

1

2

3

4

5

With what I learned today, I will be able to defeat Type 2 diabetes

1

2

3

4

5

I will start practicing what I learned

1

2

3

4

5

Today, the instructor used language I can understand

1

2

3

4

5

The response by the instructor to feedback in class was good

1

2

3

4

5

The speaker is very knowledgeable about the materials presented in today's class

1

2

3

4

5

Today's presentation enriched my knowledge

1

2

3

4

5

I enjoyed the presentation, I was actively engaged, and the class room was very conducive throughout today's presentation.

1

2

3

4

5

What part of instruction did you like best today?

Is there anything you would like to be changed in today's presentation? Please explain.

Any comments and future ideas for improvement? Please explain.

Was the temperature of the room conducive for learning? Please explain.

Appendix G: Handouts

Week 1 Section: Handouts

What is Diabetes?

A disease resulting in high blood sugar

1. Defects in insulin production

2. Defects in insulin action

3. Or a combination of both

Diabetes Mellitus

☐ 25.8 million in US (8-9% of population)

☐ Consists of 3 types:

1) Type I diabetes

2) Type II diabetes

3) Gestational diabetes (pregnancy)

Signs of Diabetes

Week 2 Section: Handouts

Complications of Diabetes

1. Cardio-vascular disease

2. Heart disease or stroke

3. Kidney disease or failure

4. Eye disease or blindness

5. Nerve damage

Week 3 section: Handouts

How does insulin work?

1. Insulin is a hormone that comes from the pancreas, the gland situated behind and below the stomach.

2. The pancreas secretes insulin into the bloodstream.

3. The insulin circulates, enabling sugar to enter your cells.

4. Insulin lowers the amount of sugar in your bloodstream.

5. As your blood sugar level drops, so does the secretion of insulin from your pancreas.

American Diabetes Association. Retrieved from http://www.diabetes.org/diabetes-basics/diagnosis.

Type 2 Diabetes

☐ Pancreas "Poops" out

☐ Blood glucose levels rise due to: Insulin resistance

Insufficient insulin production

☐ Eventually leads to β-cell failure (Pancreas stops working)

☐ > 90% of diabetics are in this group

American Diabetes Association. Retrieved from http://www.diabetes.org/diabetes-basics/diagnosis.

Week 4: Section: Handouts

Management of type 2 diabetes

Exercise (is the 1st step in improving your health)

☐ Recommendations: Making physical activity part of your daily routine.

 Just never give up, run when you can, walk when you have to, crawl if you must.

way to go in prolonging life in diabetic world.

physical activity

☐ Duration---30-45 minutes

☐ Frequency---5 times per weak

☐ Intensity---moderate to brisk walk or the feeling of working somewhat hard.

☐ Dancer, S., & Courtney, M. (2010). Improving diabetes patient outcomes:

Framing research into the chronic care model. Journal of the American Academy of Nurse

Practitioners, 22, 580-585.

Diabetes – Oral Medications

☐ Sulfonylureas

☐ Biguanides

☐ Thiazolidinedione's TZD

☐ Alpha-glycosidase inhibitors

☐ Meglitinides

☐ Incretin Drugs

– DPP4 Inhibitors,

– GLP-1, Byetta and Victoza

Diabetes – Insulin

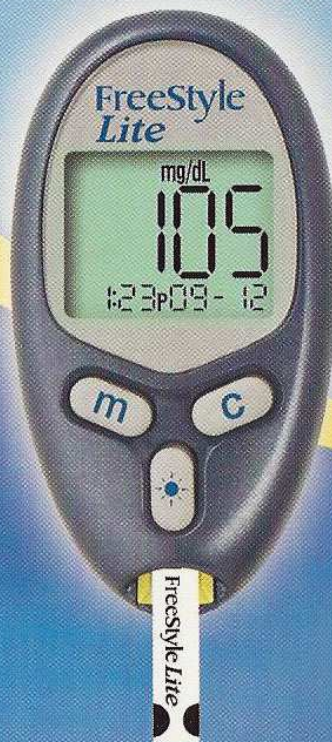☐ Rapid Insulin, Humalog, Novolog and Apidra

☐ Regular Insulin (not used as much)

☐ Combination Rapid and Intermediate

- Humalog 75/25

- Novolog 70/30

☐ Long acting Insulin or Basal Insulin,

- Lantus

- Levemir

☐ Insulin   Onset Peak Duration

☐ Rapid Insulin   <15 min   1.2-1 hour   3-5 hours

☐ Regular Insulin   30-60 min   1-2 hours   5-8 hours
☐ Combination   <15   60 min   Up to 12 hours
☐ Basal Insulin   1 hour   12-24 hours

Aggressive Treatment in Diabetes is Key

☐ lifestyle changes

- Exercise and diet.

- Learn about what foods make your diabetes better or worse.

  Learn as much about your diabetes as you can and take control of your life

Week 5 Section: **Handouts**
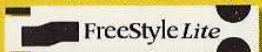
Coding Tool

CONTROL #- _____   Serial #- _____

Baseline FBS _____   Date _____

Baseline HbA1c _____   Date _____

Baseline Weight _____   Date _____

Baseline BMI   _____   Date _____

Baseline Total chol_____ HDL-C _____, LDL-C _____ Trig _____ Date _____

Follow-up FBS _____   Date _____

Follow-up HbA1c _____   Date _____

Follow-up Weight _____   Date _____

Follow-up BMI   _____   Date _____

Follow-up Total chol_____ HDL-C _____, LDL-C _____ Trig _____ Date _____

GLUCOMETER TESTS (fasting - odd number lines, after meal -even number lines)

1. _____Date _____Time _____   7._____ Date_____Time_____
2. _____Date _____ Time_____   8._____ Date_____Time_____

3. _____ Date_____Time_____   9._____ Date_____Time_____
4. _____ Date_____Time_____   10._____Date_____Time_____

5. _____Date_____Time_____   11._____ Date_____ Time_____
6. _____Date_____Time_____   12._____ Date_____ Time_____

How to Use a Glucometer

One of the most important tools that a diabetic can have is a blood glucose meter, otherwise known as a glucometer. This hand-held machine allows diabetics to monitor the amount of glucose in their blood, which is critical in determining what food they can eat and how well any medication is working in controlling high blood sugar levels.

Things You Need

Diabetic glucometer

Test Strips

Lancets

Alcohol

Cotton Balls

Sharps Disposal Container

Paper and pencil (if your meter does not automatically store your results)

Steps

1. Obtain a glucometer and test strips. You can go to any drugstore and buy a blood glucose meter. Many insurance companies will pay for your meter and test strips if you obtain a prescription from your doctor.

2. Read the materials and directions that come with your meter. Familiarize yourself with all the functions of your blood glucose meter. Determine where you insert your test strip and where the readout will be.

3. Test the glucometer before using it. Most glucometers include a way to test to make sure they are reading correctly. This could be in the form of a premade test strip or a liquid you place on a test strip. These are inserted into the machine and the reading should be within acceptable limits.

4. Wash your hands thoroughly, including the area from which you are going to draw blood. Most diabetic glucometers instruct you to prick your finger for a sample, but some of the newer blood glucose meters let you use an area on your arm. Determine which of these areas is acceptable for your meter.

5. Place alcohol on a cotton ball.

6. Place a test strip into the slot provided on the glucometer.

7. Swab the area you are going to use to draw your sample from with the cotton ball. Alcohol evaporates rapidly so there's no need to dry the area. That will just re-contaminate it.

8. Wait for the readout on the diabetic glucometer to tell you to put the drop of blood on the strip. The readout may actually say "place sample on strip," or it may give you a symbol, such as an icon that looks like a droplet of liquid.

9. Use the lancet provided with the diabetic glucose meter and prick the area for the sample.

10. Place a drop of blood on the test strip. The newer strips offer a "wicking" action that will draw the blood up into the test strip. Older meters and strips require you to actually drop blood onto the strip. Most diabetic glucose meters require no more than a drop of blood to test.

11. Wait for results. The meter will begin a count down in seconds once the sample hits the strip and the meter detects it. For newer meters it will be 5 seconds, but older meters could be 10 to 30 seconds. The meter will sound a tone, or beep, when it has a reading for you.

Sharps Container Disposal Instructions

Instructions for Proper Disposable of Sharps Container

Sharps containers are used for safe disposal of clinical sharps to prevent needle stick injury and infections. There are a large assortment of sharps waste disposal containers ranging from 1.5L to 100L, and even larger, for the purpose of disposing of your used lancets.

Sharps containers are considered a household hazardous waste and need to be disposed of in a proper manner. Never put a Sharps container in a trash or recycling bin.

We encourage you to bring your Sharps container to your PCP for proper disposal: The County of Los Angeles offers a Household Hazardous and Electronic Waste Collection Program where you can also dispose your Sharps container. They have permanent centers in various locations and also mobile collection events. For more information, call 1 (888) CLEAN LA or www.888CleanLA.com. For information about Sharps and lancing devices, you can visit the FDA's website: http://www.fda.gov/diabetes/lancing.html

Why Test Your Blood Sugar

Blood sugar testing or self-monitoring blood glucose provides useful information for diabetes management. It can help you to judge how well you're reaching overall treatment goals, understand how diet and exercise affect blood sugar levels, and understand how other factors such as illness or stress affect blood sugar levels.
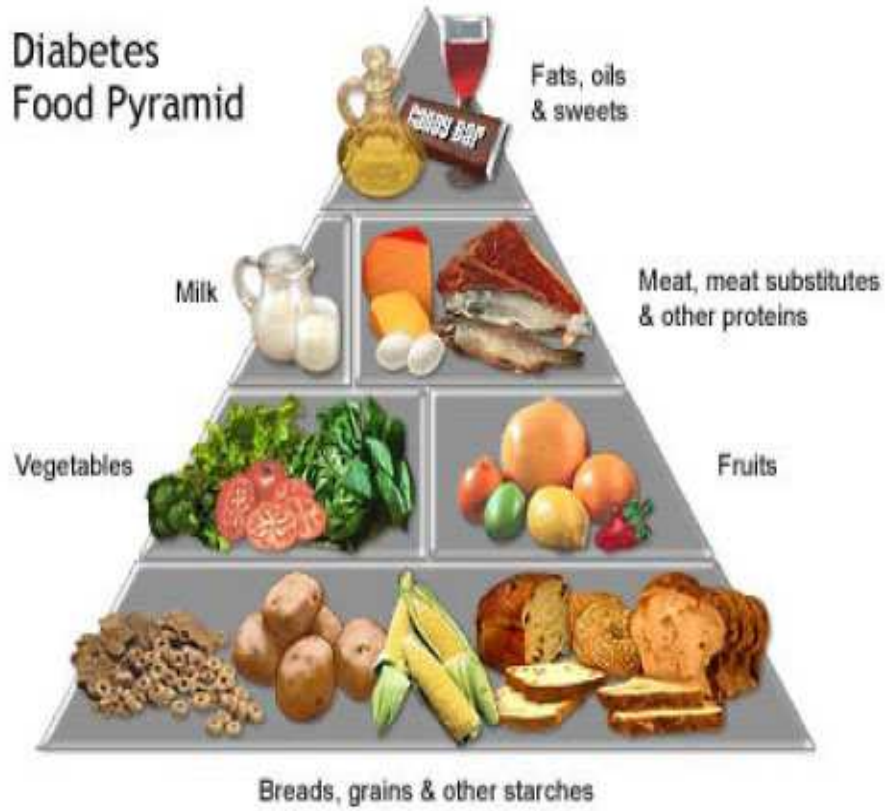
Keeping a Record of Food you eat and You Blood Sugar Level

Keeping a food blood sugar level record can guide you for how you eat, especially whether your diet is well balanced or totally off-centered for a diabetic diet. If your journal entries include more fast food, starchy foods or packaged meals than veggies, lean meat, and whole grains, it's time to make a modification

Diabetics Food Pyramid

Diabetes Food Pyramid

Fats, oils & sweets

Milk

Meat, meat substitutes & other proteins

Vegetables

Fruits

Breads, grains & other starches

A.D.A.M.

http://saudigazette.com.sa/life/diabetics-prohibited-food/

Samples of Fruits and Vegetables and Delicious Meals

Delicious Meals that Fit a Diabetic Diet

http://www.diabetesforecast.org/2015/adm/recipes/savory-asparagus-oatmeal.html

Week 6 section: Handouts

Food choice is one of the keys for prevention and management of type 2 diabetes

CHICKEN STROGANOFF

Low Carb Handout

How many carbs are in my favorite foods?

For foods that come in packages, the best place to find the carb count is on the Nutrition Facts label. The grams of total carbohydrate on the label are the key to carb counting. Don't worry about counting the sugar and fiber grams. They are included in the total carb number.

Check serving size.
Information on the label is based on the serving size

See how many grams of carb are in each serving

Decide whether the food fits into your meal plan

Nutrition Facts

Serving Size 1 cup (40g)
Servings Per Container 2.5

Amount Per Serving

Calories 150   Calories From Fat 10

	% Daily Value*
Total Fat 3g	4%
Saturated Fat 0.5g	2%
Trans Fat 0g	0%
Cholesterol 0mg	0%
Sodium 10mg	1%
Total Carbohydrate 24g	9%
Dietary Fiber 4g	15%
Sugars 1g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Carbohydrate counting is very vital to maintain a healthy blood sugar level.

The following points should be remembered at all times:

- Most carb foods: grains like rice, oatmeal, and barley.
- Grain-based foods like bread, cereal, pasta, and crackers.
- Starchy vegetables like potatoes, peas and corn.
- Beans and peas (e.g., black beans, garbanzo beans, kidney beans, pinto beans, split peas, lentils).
- Fruit and juice.

The NO Carb Food Group includes: meats, eggs, cheese, fats, and green leafy vegetables

What healthy food choices should I make?

Eat more fiber by eating more whole-grain foods. Whole grains can be found in:

- Oatmeal.
- Whole-wheat bread, bagels, pita bread, and tortillas.
- Breakfast cereals made with 100% whole grains.
- Whole grain rice.

Eat a variety of fruits and vegetables every day. Choose fresh, frozen, canned, or dried fruit and 100% fruit juices most of the time. Eat plenty of veggies like these:

- Orange veggies (e.g., carrots, sweet potatoes, pumpkin, winter squash
- Dark green veggies (e.g., broccoli, spinach, brussels sprouts).

.**What should I eat less of?** Consume fewer foods that are high in sugar, such as:

- Sodas.
- Fruit-flavored drinks.
- Tea or coffee sweetened with sugar.

Use less salt in cooking and at the table. Eat fewer foods that are high in salt, such as:

- Canned Pickles.
- Processed meats.
- Canned vegetables.
- Canned and package soups.

Where Can I Learn About Making a Diabetes Meal Plan?

Visit the American Diabetes Association Web site for more information on carbohydrate

counting and the exchange method

(www.diabetes.orghttp://www.cdc.gov/Other/disclaimer.html)

Visit the Academy of Nutrition and Dietetics, formerly the American Dietetic Association Web site to find a nutrition professional that can help you develop a healthy meal plan (www.eatright.orghttp://www.cdc.gov/Other/disclaimer.html).

Visit the American Association of Diabetes Educators to find a diabetes educator (www.diabeteseducator.org).

Prevention is the best way to go. Careful management of type 2 diabetes can reduce your risk of serious even life-threatening complications.

Outcome Evaluation: 6months post implementation per chart review

Outcome Evaluation Goal: Reduces number of prediabetes that convert to type 2 diabetes. and prevent complications on patients already have type 2 diabetes.

Appendix H: Pamphlets

Overview of Type 2 Diabetes

Type 2 diabetes, once known as adult-onset or noninsulin-dependent diabetes, is a chronic condition that affects the way the body metabolizes glucose, which is the body's source of fuel. With type 2 diabetes, the body either resists the effects of insulin —a hormone that regulates the movement of sugar into the cells–or doesn't produce enough insulin to maintain a normal glucose level.

While it is more common in adults, type 2 diabetes increasingly effects children as childhood obesity increases. There's no cure for type 2 diabetes, but people with type 2 diabetes may be able to manage this condition by eating well, exercising, and maintaining a healthy weight. If diet and exercise aren't enough to manage blood sugar level well, the individual may need diabetes medications or insulin therapy.

Prediabetes: What Is It?

People with blood glucose levels that are higher than normal but not yet in the diabetic range have " prediabetes." This condition is also called impaired fasting glucose (IFG) or impaired glucose tolerance (IGT). Insulin resistance and prediabetes usually has no symptoms. Patients may have one or both conditions for several years without noticing any clinical symptoms.

If you have prediabetes, you have a higher risk of developing type 2 diabetes. In addition, people with prediabetes also have a higher risk of heart disease. Progression to diabetes among those with prediabetes is not inevitable. Studies suggest that weight loss and increased physical activity among people with prediabetes prevent or delay diabetes and may return blood glucose levels to normal.

Prediabetes: Should We Care About It?

Pre-diabetes is a condition that almost always precedes type 2 diabetes and is identified by a laboratory fasting blood glucose level that is higher than normal but not high enough to be diagnosed as diabetes. Current research suggests that damage to the blood vessels in the body may already be occurring during pre-diabetes. People with pre-diabetes often have no symptoms but are more likely to develop type 2 diabetes over time. Having type 2 diabetes increases your risk for many serious health problems which can affect your heart, eyes, nerves, skin, kidneys and more. People with type 2 diabetes have a higher risk of dying from complications that arise from the disease, if not cared for.

Any Good News About Preventing or Delaying the Onset of type 2 Diabetes?

The good news is that you can prevent or delay the onset of type 2 diabetes by adopting a healthier lifestyle through diet and exercise. Genetics plays a role in developing type 2 diabetes, but so do lifestyle factors. You cannot change your genetics BUT you can change your lifestyle to include better eating and exercise habits.

In general, maintaining a healthy weight through a reduction of "sugars or carbs" in the diet is a first step towards maintaining good glucose control. Increased physical activity such as increased walking or simply moving around can also help to maintain your blood glucose levels. Those already diagnosed with type 2 diabetes can manage their disease through a combination of treatments, including diet control, exercise, self-monitoring of blood glucose, and in some cases, oral drugs or insulin.

Physiology of the Risk Factors

Being Overweight or Obese

Being overweight is a primary risk factor for type 2 diabetes. The more fatty tissue you have, the more resistant your cells become to insulin. However, you don't have to be overweight to develop type 2 diabetes.

Fat Distribution

If your body stores fat primarily in your abdomen, your risk of type 2 diabetes is greater than if your body stores fat elsewhere, such as your hips and thighs.

Being Physically Inactive

In particular, exercising fewer than three times a week. The less active a person is, the greater the risk of type 2 diabetes. Physical activity helps control weight, uses up glucose as energy, and makes cells more sensitive to insulin.

Having a Parent, Brother, or Sister With Diabetes

The risk of type 2 diabetes increases if parent or sibling has type 2 diabetes.

Race and Ethnicity

Being African American, American Indian, Asian American, Pacific Islander, or Hispanic American/Latino heritage puts you at greater risk for type 2 diabetes. Although it's unclear why, people of certain races are more likely to develop type 2 diabetes than whites are.

Age

The risk of type 2 diabetes increases as you get older, especially after age 45. That's probably because people tend to exercise less, lose muscle mass and gain weight as they age. But type 2 diabetes is also increasing dramatically among children, adolescents and younger adults.

Prediabetes

Prediabetes is a condition in which your blood sugar level is higher than normal, but not high enough to be classified as diabetes. Left untreated, Prediabetes often progresses to Type 2 diabetes.

Having a Prior History of Gestational Diabetes or Birth of at Least one Baby Weighing More than Nine Pounds

Gestational diabetes while pregnant and giving birth to a baby weighing more than 9 pounds both increase risk of developing type 2 diabetes.

Polycystic Ovarian Syndrome

For women, having polycystic ovarian syndrome — a common condition characterized by irregular menstrual periods, excess hair growth, and obesity increases the risk of diabetes.

High Blood Pressure and Cholesterol

Blood pressure measuring 140/90 or higher and having an abnormal cholesterol with HDL ("good") cholesterol of 35 or lower, or triglyceride levels of 250 or higher increases the risk of diabetes.

<div align="center">

Physiology of the Clinical Symptoms

</div>

Signs and symptoms of type 2 diabetes often develop slowly. In fact, you can have type 2 diabetes for years and not know it. Some of the signs include the following:

Increased Hunger

Without enough insulin to move sugar into your cells, your muscles and organs become depleted of energy. This triggers intense hunger.

Blurred Vision

 If your blood sugar is too high, fluid may be pulled from the lenses of your eyes. This may affect your ability to focus.

Fatigue

If your cells are deprived of sugar, you may become tired and irritable.

Increased Thirst and Frequent Urination

Excess sugar building up in your bloodstream causes fluid to be pulled from the tissues. This may leave you thirsty. As a result, you may drink and urinate more than usual.

Areas of Darkened Skin

Some people with type 2 diabetes have patches of dark, velvety skin in the folds and creases of their bodies — usually in the armpits and neck. This condition, called acanthosis nigricans, may be a sign of insulin resistance.

Weight Loss

Although some diabetic patients eat more than usual to relieve hunger, some may lose weight. Without the ability to metabolize glucose, the body uses alternative fuels stored in muscle and fat. Calories are lost as excess glucose is released in the urine.

Slow-Healing Sores or Frequent Infections

Type 2 diabetes affects the body's ability to heal and resist infections.

How Does Insulin Work

Insulin is a hormone that comes from the pancreas, a gland situated behind and below the stomach. This is the process of how insulin works in the body:

The pancreas secretes insulin into the bloodstream.

The insulin circulates, enabling sugar to enter your cells.

Insulin lowers the amount of sugar in your bloodstream.

As your blood sugar level drops, so does the secretion of insulin from your pancreas.

The Role of Glucose

Glucose is a main source of energy for the cells that make up muscles and other tissues and comes from two major sources: food and your liver. Sugar is absorbed into the bloodstream, where it enters cells with the help of insulin. Your liver stores and makes glucose. When your glucose levels are low, such as when you haven't eaten in a while, the liver breaks down stored glycogen into glucose to keep your glucose level within a normal range. In type 2 diabetes, this process doesn't work well. Instead of moving into your cells, sugar builds up in your bloodstream. As blood sugar levels increase, the insulin-producing beta cells in the pancreas release more insulin, but eventually these cells become impaired and can't make enough insulin to meet the body's demands.

Common Signs of Diabetes

- Thirst

- Increase urination

- Hunger and fatigue

- Weight loss or weight gain

- Blurred vision

- Numbness feet and hands

- Increase infections and slow healing wounds

- Nausea and vomiting and stomach pains

A Group Medical Appointment

A group medical appointment (GMA) or group visit is a medical appointment held by a health care provider in a primary care setting. The health care provider is supported by other professionals in regards to various educational needs during the appointment that may last 90 minutes or longer to provide routine or follow up care for groups of patients at one time. GMAs allow the health care provider and health care team the opportunity to address patient needs outside the confines of today's shortened one-on-one traditional office visits.

GMAs are an important component of the Chronic Care Model that combines medical care, patient education and patient empowerment in a primary care office setting. GMA is, interactive, voluntary care, delivery systems that empower patients as their own caregivers, in addition to being effective and efficient.

GMA Benefits Include the Following

- Improved management of busy practices that do not have time to provide education during routine visits

- Improve efficiencies by providing the health care provider the chance to provide   some information to a group that might otherwise be delivered in multiple one-on-   one appointments

- Grant more time for patient visits

- Increase patient education and opportunity for patients to ask questions

- Identification of potential psychosocial issues and steps for appropriate follow up

- Peer support, help and encouragement for other patients in the group

Time Frame and Process of GMAs

- A group medical appointment time frame is 90-120 minutes

- Patients arrive at the scheduled date and time, check-in and sign a confidentiality document, and are placed in an exam room for the health care provider to conduct a brief examination (including blood pressure, hemoglobin A1c levels, fasting blood sugar levels, heart, lungs and weight)

- Each examined patient returns to the designated group room, where the medical assistant reviews educational forms and discusses handouts

- The health care provider enters the group room at the completion of all physical exams, reviews briefly the power point presentation on Type 2 diabetes and prevention assigned for that day, and then addresses individual patient concerns and reviews labs with each individual patient while education is continued with other group members

A GMA allows more time with a health care provider and staff, as well as other patients who have diabetes. The time spent will provide patients with more time for questions and concerns in a relaxed, educating and supportive setting, compared to the traditional office visit which has time limits.

This appointment is a new way to prevent and treat diabetes and its benefits may include improving understanding about diabetes, introducing new ways to treat diabetes, as well as encouraging active participation in patients' own health care needs.

Complication of Diabetes

Macro-vascular Disease

- Atherosclerosis

- Heart attack or stroke

- Cholesterol or triglyceride problems

- 82,000 heart disease deaths/year

☐ Diabetics are 2 to 4 times greater risk

American Diabetes Association. Retrieved from http://www.diabetes.org/diabetes-basics/diagnosis.

Kidney Disease

☐ 14- 25% of all people with diabetes develop kidney disease

☐ Diabetic nephropathy is the most common cause of end-stage kidney disease and failure which leads to renal dialysis.

Retinopathy

☐ 14,000 to 28,000 people lose their sight each year because of diabetes.

☐ Diabetes is the leading cause of new blindness in people 20-74 years of age.

Neuropathy

☐ 60-70% of diabetics develop some form of nerve damage.

☐ Nerve damage –hands and feet may hurt, tingle or feel numb, this can lead to loss of a foot or leg due to amputation.

☐ Slow healing wounds

American Diabetes Association. Retrieved from http://www.diabetes.org/diabetes-basics/diagnosis.

What is a hemoglobin A1C level?

☐ 3- Month marker on diabetes control

☐ Non-diabetic patient   4.0-6.0%

☐ Goals: ADA <6.5   AACE <6.5

Average HGB A1C   Est. Average BG

Average HGB A1C	Est. Average BG
6%	126
7%	154
8%	183
9%	212
10%	240
11%	269
12%	298

American Diabetes Association. Retrieved from http://www.diabetes.org/diabetes-basics/diagnosis.

What does diabetes affect?

☐ Your pancreas

☐ Your liver

☐ Your stomach and intestines

☐ Your heart

☐ Your kidneys

☐ Your blood vessels

☐ Every cell in your body

☐ Your entire body can be affected

Aggressive treatment in diabetes includes

☐ Lifestyle changes and nutritional planning

☐ Exercise and weight loss

☐ Blood pressure control

☐ Cholesterol and triglyceride control

☐ Close monitoring of blood sugars

☐ Stop Smoking (430,000 people die from use of tobacco every year.

U.S. Department of Health and Human Services. (2012). Retrieved from Diabetes public health

resource: http://www.cdc.gov/diabetes/pubs/factsheet11.htm