Collaborative Care for Patients with Metabolic Syndrome

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Introduction

Metabolic syndrome (MS) is a medical condition experienced by a growing population that leads to coronary artery disease (Center for Disease Control and Prevention [CDC], 2016). According to the CDC, MS is considered to be a group of biological factors that are characterized by abdominal obesity, dyslipidemia, hypertension, and type 2 diabetes mellitus (CDC, 2016; Moore, Chaudhary, & Akinyemiju, 2017). Individuals who meet three of five risk factors specified by the American Heart Association (AHA), meet criteria to be identified with MS.

According to the AHA (2013), MS increases the risk of coronary heart disease (CAD). Therefore it is essential that health care providers formulate an aggressive plan, which targets the population suffering from MS. Otherwise, there will be an exponential increase in the population of individuals diagnosed with CAD. Nurse Practitioners (NPs) enhance health promotion and disease prevention by working in collaboration with physicians and other health care professionals. They can formulate educational material for the population, and healthcare professionals with the intention to transform healthcare.

Background

MS is considered to be a very serious health condition. MS consists of a series of risk factors including:

- Central obesity, measured by waist circumference (Men increased incidence more than 40 inches; Woman more than 35 inches)
- Fasting blood glucose level of 100mg/dl, or taking medication to treat diabetes
- Hypoalphalipoproteinemia; (Men increase incident less than 40 mg/dl; Woman less than 50 mg/dl)

- Hypertriglyceridemia; fasting more than 150 mg/dl or taking medication
- Hypertension; 130/85 or higher, or taking medication (American Heart Association [AHA], 2015).

According to the World Health Organization ([WHO], 2016), obesity rates worldwide have increased dramatically during the past three decades. . It is expected that MS rates will continue to rise, predisposing individuals to CAD (Moore, et al., 2017). It is imperative for NPs to improve the nation's health, by encouraging health promotion within the community as well as collaborating with other nurse practitioners to improve patient outcomes (Chism, 2016).

Purpose Statement

The purpose of the project is to improve the health and awareness of patients experiencing MS, by developing a treatment and prevention protocol, which is founded and supported by evidence based practice (EBP). Data will be collected through retrospective patient chart audits and post implementation chart audits. The use of the protocol within practice will aid in identifying individuals who meet the criteria for MS, and assist NPs in the management of these conditions. The variables that will be selected to categorize patients with MS include blood pressure, fasting blood glucose, and waist circumference. The intention of this project is to educate primary care providers (PCP) in identifying individuals who meet the criteria for metabolic syndrome, and implementing protocols for treatment and prevention. Additionally, quality improvement such as blood pressure control, glucose management, and obesity rates are expected to stabilize within practice cite.

Project Question

In patients with or at risk of MS, will a MS treatment and prevention protocol improve early identification and blood pressure control, blood glucose management, and weight over a span of 4-6 weeks?

Project Objectives

The objectives of this DNP project are to:

(1) Provide an educational workshop for provider at the practice site including a background of MS, treatment strategies to include medications and supplements, and nutritional therapy.

(2) Develop and implement a MS protocol at the practices to identify and improve patient outcomes. These tools include my life check, laboratory values, and blood pressure monitoring.

(3) Evaluate changes in practitioner knowledge and patient outcomes. Improvement in patient outcomes will be determined by measuring pre and post implementation weight circumference, fasting blood glucose levels, and blood pressure. Improvement in practitioner knowledge will measure pre and post knowledge levels assessed by questionnaire.

Literature Review

An extensive literature search was done by utilizing the Touro University Library database CINAHL, EBSCO, ProQuest, Google and PubMed. The search included English language, full text scholarly peer reviewed journals, with dates ranging from May 2012 to May 2017. The words MS, diabetes, obesity, life style modifications, and nutrition were searched between articles. The current literature review includes information on MS, the impact of education on patient outcomes, the importance of educating providers in identifying and educating their patients, including managing diabetes, hypertension, dyslipidemia, as well as

obesity with life style modifications, supplements, dietary therapy, and medications directly linked to the project. A total of 10 articles were included in the research, and five excluded due to outdated data.

The subjects' criteria of inclusion included the following: adults over 18 years age, all races, males and females. The subjects' criteria of exclusion included children younger than 17 years of age. The selections of articles included and excluded in the literature review were established on the content of the article. This writer's criteria for inclusion considered of articles pertaining to diagnosing and treating conditions such as: MS, type two diabetes mellitus in adult patients, and more. The specific articles and studies excluded pertained to children, childhood obesity, and type one diabetes.

Metabolic Syndrome Defined

Kaur (2014) provides an overview of MS defining it as "a constellation of interconnected physiological, biochemical, clinical, and metabolic factors that directly increases the risk of cardiovascular disease, type 2 diabetes mellitus, and all-cause mortality" (p.2). He uses a qualitative method to discuss lifestyle modification and treatments aimed at removing symptoms of MS, and how they impact patients. The source summarizes literature related to this disease, epidemiology, pathogenesis, and treatment, which is imperative for a protocol to educate healthcare providers.

Learning more about MS will aid in the successful management of metabolic syndrome and care. Kaur (2014) reviews information on MS suggests lifestyle modifications are the gold standard to target metabolic syndrome. The author discusses difficulties in the management of metabolic syndrome, and the absence of a recognized method to prevent or improve this condition. Many individuals that are categorized with MS (including those at risk) are unaware

of the terminology MS, (Moore, et al., 2017). According to Kaur (2014), the majority of physicians treat the components of MS separately. Providers find it easier to write a prescription to lower hypertension, blood glucose levels, and dyslipidemia rather than to educate and counsel patients on life style modifications that would lead to a reduction of lifetime risks (Kaur, 2014).

Grundy (2012) considers MS with regard to pre-diabetes and uses qualitative method to fully explore the topic. He defines it as an elevation of plasma glucose above the norm, but less that of clinical diabetes. People with MS face nearly five-fold increase in diabetes risk; there is a correlation between pre-diabetes and MS (Grundy, 2012). Grundy (2012) mainly discusses pre-diabetic state but mentions that MS is more likely to face a risk of microvascular, as well as macrovascular disease. This source is useful for research because the author considers MS with regard to other diseases and states, and should be used to distinguish between them all. The information the article provided will be utilized to educate nurse practitioners on the importance of monitoring fasting blood glucose levels, and addressing individuals whose values are out of the normal range.

Tavares et.al. (2015) considers that MS affects more people and increases a risk of metabolic and cardiovascular diseases. The source reviews this syndrome, controversy, and prevalence in this sphere using quantitative methodology. The work is based on a literature review of 43 recently published articles. It suggests providing future research because the prevalence of MS increases every day, and there is a need to establish early diagnosis and treatment. The strength of the source includes the idea that MS appears to be an epidemic of the 21st century, and individuals have to report at least three criteria of MS. The most important factors to prevent this condition are: glycemic control, body mass index (BMI), and lipid profile (Tavares et al., 2015).

Education about risk factors in MS positively impacts patient outcomes. Kaur (2014) wrote an article on assessment and screening of the risk factors in MS using qualitative methodology, which emphasizes that timely information about risk factors allows timely prevention of the syndrome. It is very important to identify patients at risk and those already suffering from the condition in early stages. Clinical and biochemical measurements included the following: BMI fasting blood glucose, high-density lipoprotein (HDL), and blood pressure readings (Kaur, 2014).

O'Neill and O'Driscoll (2014) mention that MS contributes to various health factors, and its definition is of great clinical importance. The article reviews general information on this syndrome through qualitative methodology, and its association with life-threatening conditions such as the relationship between diabetes and cancer, as well as cardiovascular disease. Although there is limited research on the relation between MS and cancer, the authors provide a new point of view that is worth considering in this project. They disclose that reducing one or two of components of MS would positively impact the financial burden these conditions have on the national healthcare system (O'Neill & O'Driscoll, 2014).

Srikanthan, Feyh, Visweshwar, and Shapiro (2016) provides a literature review aimed to explore biomarkers used to identify MS. Identifying the biomarker associated with MS would improve the primary care provider's recognition of those at risk, provide prevention for this condition, and treat earlier to prevent complications. The source suggests providing further research to determine the efficacy of applying biomarkers to diagnosis and treatment of MS because this sphere is not identified yet.

According to Srikanthan et al., (2016), MS is considered to be a multifactorial condition that stems from obesity. More than one-third of the population in the United States (US) are

obese (CDC, 2016). Obesity prevalence continues to increase worldwide, it is imperative to identify individuals who are either at risk for MS or already categorized with MS, in order to provide adequate testing, and educate on the syndrome to increase patient awareness and the ability to self-care. The strengths of source include identification of a panel of biomarkers. However, it does not provide any radical viewpoint of metabolic syndrome. The authors suggest furthering developing biomarkers to early detect MS.

Ghee and Kooi (2016) analyzed the prevalence of MS in Malaysia using qualitative methodology. Nearly 27% of study population above 30 years of age appeared to have two or more risk factors for MS. With regard to individuals, most individuals at risk develop this condition; therefore, it is essential to an impellent policy aimed at educating the public about metabolic syndrome. Thus, the prevalence of MS increases above the age of 40 years of age. Additionally, a study suggests that women from Indian ethnicity report the highest rates of MS versus men (Ghee & Kooi, 2016).

It is noteworthy that management of MS includes a nutrition education intervention program geared toward individuals at risk, including obese men and woman over 40 years of age. Counseling sessions, talks, and demonstration of cooking, and exercise practices are all teaching methods that can be utilized (Ghee & Kooi, 2016). Physical activity positively affects basic modifying risk factors of MS. The strengths of this source are the addition of biomarkers that include vitamin insufficiency which has a direct impact in individuals diagnosed with MS (Ghee & Kooi, 2016).

Limited research shows the possible link between obesity and MS. There is also possible relationship between MS and cancer, which leads to the remodeling of tissue and an increase in adipose tissue (Sartorius et.al., 2016). According to modern data obtained through qualitative

method of research, the pathogenesis of MS is based primary on insulin resistance and systemic hyperinsulinemia. Insulin resistance is a decrease in the biological effects of endogenous or exogenous insulin, which is the result of a variety of interrelationships among genetic factors such as violation of receptor and post receptor mechanisms of insulin signaling and environmental factors (Sartorius et.al., 2016). Genetic predisposition to insulin resistance can never be realized in the absence of adverse effects of external causes; the most important factors include high-calorie nutrition with excessive intake of fat and low physical activity, these factors contribute to the development of obesity (Sartorius et.al., 2016).

Diagnosing Metabolic Syndrome

To date, there are several methods or criteria for diagnosing MS. Different sets of criteria were proposed by the WHO and the International Diabetes Federation (Apovian et.al., 2015). Apovian etal. (2015) used qualitative methods to determine that the doctor ultimately collects an anamnesis and compiles a medical history. Surveys helped determine what causes led to obesity and the development of MS: living conditions, nutrition, addiction to sweet foods, how many years ago excess weight appeared, whether relatives suffer from obesity, presence of cardiovascular diseases, and blood pressure level (Apovian et.al., 2015).

Medical professionals should educate patients that in order to restore metabolism and increase the sensitivity to insulin, it is necessary to fulfill such conditions through proper nutrition with a low carbohydrate content and moderate physical activity. During sports, the body burns fat stores. Through training, hormones of happiness - endorphins are produced in the brain. These substances do not only improve mood, but also help to control appetite and reduce cravings for carbohydrates. Therefore, consumption of protein helps to fight against hunger (Ghee & Kooi, 2016).

Good mood and well-being increases sensitivity to insulin and improve health, slowing down the aging process, and increases efficiency (Grundy, 2012). The main goal of a diet in MS is to limit the intake of carbohydrates and fats. This will help to stop obesity and promote gradual weight loss. It is essential to note that modern nutritionists reject starvation and low-calorie diets. In this case, people constantly experience hunger, so only people with the strong will can adhere to such a diet (Grundy, 2012). Providing a list of foods to healthcare providers that they can provide to their patients, will allow individuals to identify healthy foods that they can consume.

In summary, MS is a combination of several powerful risk factors leading to atherosclerosis and coronary artery disease. MS is widespread among the adult population of the developed and developing countries of the world. Timely detection and correction of the MS play an important role in the primary prevention of cardiovascular disease. The roots of MS are currently understood, but issues that are not addressed include policy on how to prevent this state. All sources directly relate to the goal of the project and will be useful to develop a protocol to educate healthcare providers on identifying their patient at risk for metabolic syndrome and ones already suffering from the condition.

Theoretical/Conceptual Framework

A theoretical framework is used in research to provide guidance and offer meaning to findings (Green, 2014). Theories guide researchers to develop interventions that encourage health promotion for individuals. Additionally, a framework defines variables, identifies variable relationships, and offers a framework to examine outcomes (Moran, Burson, & Conrad, 2014). Selection of an appropriate theory for a study is of great importance; the researcher must choose a theory that can best identify the phenomenon of interest (Moran et al., 2014). The

theories selected to serve as guidance during the development of this DNP project are the Theory of Self Care by Doctor Dorothea Orem, and Transcultural Nursing Theory by Doctor Madeline Leininger. The goal is to reduce MS by promoting compliance with appropriate self-care modification techniques in a culturally competed manner.

Orem's Self Care Theory is composed of three interrelated parts: Theory of Self Care, Theory of Self Care Deficit, and the Theory of Nursing Systems (Nursing Theory, 2016). Orem's exposure and interaction with nurses while fulfilling her role as a nursing consultant in the Division of Hospital and Institutional Services of the Indiana State Board of Health helped her to the development of these theories. She realized that nursing involved thinking and communication skills, which led her to the development of her definition of nursing.

Orem's Theory of Self Care was first published in 1949, she continued to further develop her ideas and work towards her theory expansion until the year 2001. Dr. Orem believed that humans need to master the ability to care for self; self-care is an essential element to maintain one's own optimal health (The University of Tennessee at Chattanooga School of Nursing faculty and Students [UOTSON], 2016). She considers abilities to care for self are learned behaviors. It is imperative that nurses have an understanding of self-care and recognize that human beings are both the focus and agents of their own actions (Denyes, Orem, & SozWiss, 2001). An important element addressed in Orem's theory is that individuals are influenced by their culture and environment. This fact motivated this writer to also incorporate Dr. Madeline Leininger Transcultural Theory.

Dr. Madeline Leininger is the founder of the first transcultural theory known as the Cultural Care Theory. She began the development of this theory in the 1950's after returning from Eastern Highlands of New Guinea. During the three years she spent working and

researching individuals from a non-Western culture, she learned the importance of culture in relation to well-being (Leininger, 2009). Her main focus consisted of providing a holistic approach in the delivery of healthcare by becoming aware and utilizing the individual's cultural beliefs to improve health outcomes. She believed nurses must take into consideration education, political, and religious beliefs when caring for others (Tourville & Ingalls, 2003). Her motive to develop the theory arose when she discovered that cultural care was not provided during health care services (Leininger, 2009).

Applicability of Theory to Current Practice

Application of Orem's self-care theory will serve as a reference for practitioners to properly identify the self-care deficits that patients experience. Once the deficit is identified, the practitioner can determine what kind of methods and nursing interventions that will support self-care behaviors. These behaviors include wholly compensatory, partially compensatory, and supportive-educative. The objective for applying this theory is to educate providers on recognition of self-care deficits in their patients so they can encourage their patients to care for themselves according to their optimal level of functioning (UOTSON, 2016). It is imperative to apply the nursing process, which will assist in the implementation of this theory in a systematic manner.

Dr. Madeline Leininger's Cultural Care Theory provides a framework where nurses provide care to patients always taking into consideration their cultural background and beliefs (Nursing Theory, 2016). Nurses are encouraged to assess and identify a patient's cultural background, then develop a nursing care plan based on the information obtained. Obtaining knowledge in the cultural backgrounds of their patients can help the nurses understand patients'

perceptions of healthcare and it may educate the nurses in non-traditional treatment that would potentially improve patient outcomes.

Dr. Madeline Leininger developed three nursing decisions and actions that can be utilized to accomplish culturally friendly care for patients. These decisions and actions include the following: cultural preservation/maintenance, cultural care accommodation/negotiation, and cultural care repatterning/restructuring (Nursing Theory, 2016). These modes are utilized routinely in nursing care; nurses continue to expand their knowledge in many cultural backgrounds and beliefs as they become exposed to different cultures. This exposure educates nurses in providing a holistic approach, where one not only focuses on an illness, but rather engages with the person's beliefs about the healing process.

Major Tenets of Theories

Theory of Self Care include the following tenets:

- Self-Care- preform activities on their own to maintain health and well-being
- Self-care agency- the ability to care for self varies on age, experiences, sociocultural orientation, and resources
- Therapeutic self-care demand- "totality of self-care actions to be performed for some duration in order to meet self-care requisites by using valid methods and related sets of operations and actions" (Dorothea Orem's Self-Care Theory [DOSCT], 2012, para. 12).
- Self-care requisites- actions towards self-care. Three categories, these include the following: Universal self-care requisites, developmental self-care requisites, health deviation self-care requisites (DOSCT, 2012).

Theory of Cultural Care include the following tenets:

- Care- to assist others in their needs to improve health
- Caring- action of providing care
- Culture- an individual's values and beliefs
- Cultural Care- multiple aspects of culture that influence care to improve health
- Cultural Care Diversity- Difference in beliefs and values between groups of individuals
- Cultural Care Universality- Care that is similar to every culture
- Nursing- a learned profession, focused on caring for individuals
- Worldview- people's opinions on life
- Cultural and Social Structure Dimension- factors that include religion, politics, economics, education, culture and other topics which affect the response of humans
- Health- well-being
- Cultural Care Preservation or Maintenance- activities in relation to their culture that contribute to health
- Cultural Care Accommodation or Negotiation- coming to term by negotiation to achieve a positive health outcome
- Cultural Care Repatterning or Restructuring- holistic action by a culturally competent nurse by respecting cultural beliefs to achieve a positive outcome (Sitzman, K., & Wright Eichelberger, L., 2017).

Application of Theory to DNP Project

Dr. Orem's Self Care theory will be applied to the following project by educating NPs in how to educate their patients about their health risks and diseases. Once individuals have a clear

understanding of the risk factors associated with metabolic syndrome, life style modifications can be encouraged. The NP and other providers can educate their patients regarding diet, exercise, supplement therapy, as well as medication therapy. It is imperative that the patient manages and keeps track of own blood pressure monitoring, blood glucose monitoring, BMI, cholesterol levels, calories consumed, and minutes of exercise per week archived to keep track of their health. NPs and other health care providers will be educated using evidence-based research that will include how to identify MS patients, how to approach them based on their cultural beliefs, laboratory (lab) value parameters, blood pressure parameter, nutrition, exercise, supplementation therapy and pharmacological therapy.

In the US, cultural diversity continues to grow at a very rapid rate. The American Community Survey conducted in 2010 disclosed that about 60 million individuals out of 291 million spoke another language other than English (Ian, Nakamura-Florez, & Lee, 2016). This can be very challenging for health care professionals to communicate effectively and provide culturally competent care for their patients. According to Ian et al. (2016), the majority of healthcare providers in the U.S. are considered to be monolingual using English language only. Therefore, patients who do not speak English well cannot communicate effectively with their health care provider. This leads to a limited understanding of disease processes and treatments and a misunderstanding of cultural beliefs that could negatively impact patient (Ian et al., 2016).

It is imperative for healthcare providers to become familiarized with different cultural beliefs in order to provide culturally congruent care. The following project will provide nurse practitioners and other health care providers a protocol for patients at risk and already categorized with MS. An educational class for primary health care providers will include basic

information regarding metabolic syndrome, educational brochures, and visual aids. Additionally, the writer will incorporate cultural education within the protocol and educational class.

Individuals from different countries have different beliefs, not only spiritually but the way they lead their lives including diet, exercise, and perception of healthcare. The Nurse Practitioner implementing the protocol will incorporate the individual's cultural beliefs and values in the care provided. Understanding the individual's culture will provide insight for the provider to determine the best way to deliver appropriate care.

Project Design

The study design selected for this project is a quality improvement (QI) approach known as the Plan-Do-Check-Act (PDCA) cycle. This approach is a four-step model that can be utilized when developing a new design such as the protocol to improve healthcare outcomes (Moran, Burson, & Conrad, 2014). The benefit of the PDCA cycle is that it is a cyclical process where data is collected based on the initial plan, make necessary adjustments and restart with innovated ideas for quality improvement. The PDCA cycle involves the following steps:

Plan

According to the Health Literacy Universal Precautions Toolkit, 2015 the plan stage is designed to annotate concise information of plans that will occur during the project. The collaborative NP who will be having direct contact with the participants, and the project lead will address the following:

- Identify the need to implement a change
- Collect pertinent data pre and post implementation of the MS protocol, which include: blood pressure, fasting blood glucose, and abdominal waist circumference
- Formulate a question with the problem wanting to be solved

- Establish the desired outcomes
- Predict outcomes
- Monitor progress
- Discuss the tools utilized for data analysis
- Discuss the criteria to lead the project as of Who?, What?, When?, and Where?
- Set time limit

The NP employs a thorough systems approach in practice. The visits are very complete, where the person is addressed as a whole and not just a set of symptoms. The visit consists of an extensive interview where history, environmental and life style factors are addressed and evaluated. The comprehensive visit takes approximately one hour and a half, and it's completely documented electronically.

The patients at this practice site are mostly elderly, obese, and of limited financial resources. These factors play a major role in the increased number of patients with MS the practice site currently serves. Patients are educated and counseled on acute/chronic diseases, and life style modifications such as diet, exercise, supplementation therapy and other measures that can benefit their health. Unfortunately, patients encounter limitations that contribute to non-compliance. The large amounts of the patients in the practice have verbalized to the collaborative NP limitations that prevent them from following the plan of care.

The two main contributing factors include lack of financial resources, and their lifestyle in the winter months. Patients tend to lead a sedentary lifestyle during the winter months due to the cold weather (Jones & Gill, 2017). As such, they are unable to engage in outdoor activities and stay active. Approximately 40 to 50% of the population in the practice suffer from MS. Primarily, the diseases are being documented and coded individually. There are approximately

three to five new patients that possess three or more of the risk factors associated with MS in a monthly basis. Health conditions are being addressed in the practice site, as well as a treatment plan. An improved plan of care including food choices, exercise examples, and a nutraceutical list must be formulated to increase patient compliance, and improve patient outcomes. Since finance is a factor, the plan of care should include options of low cost or free resources available.

Do

In the do phase, the plan is to educate providers on MS via a power point presentation. Education will expand their knowledge on treatment as well as the potential benefits following the protocol can make in their practice. Chart reviews will play an important role on identifying individuals with MS, and identifying areas the NP might need improvement to aid patients in the practice cite. Additionally, a protocol with the management of impaired fasting glucose, obesity, and hypertension will be provided to the collaborating NP. The protocol will include life style modification including diet and exercise, nutraceutical and pharmaceutical therapy.

Check

According to the Health Literacy Universal Precautions Toolkit, 2015 the check phase is designed to examine if the desired outcomes were met, and what was learned. The first step is to analyze the effectiveness of the power point educational material provided to the providers. The following would be measured through a post education questionnaire. Secondly, pre-implementation MS values and four-week post implementation MS values will be measured to evaluate findings. The values utilized to measure the impact and effectiveness of educational material provided to the NP, and protocol created will include fasting blood glucose values.

Any adult over the age of 18 years old, who meets the criteria of MS, will be placed on the MS protocol. Besides increasing NP knowledge, the goal of this project is to decrease the

patient's variables that categorize them as having MS within the practice. The most important aspect is to improve this phenomenon through the normalization of fasting blood glucose, waist circumference, and blood pressure (Tavares et al., 2015).

Due to the short implementation phase, lipid levels will not be measured or utilized as a variable during this DNP project. Lipid levels are routinely measured four to twelve weeks post initiation of life style modifications and medical intervention ("American Academy Physician," 2014). It is highly recommended that patients who start taking a statin obtain lipid levels within four to twelve weeks from initiation of therapy.

Act

According to the Health Literacy Universal Precautions Toolkit, 2015, the act phase is designed to determine what was concluded from this cycle. Stable blood pressure, decreased fasting blood glucose levels and decrease waist circumference are all indicators of a successful outcome. Therefore if interventions were successful, continue implementation and make it a new standard. If findings did not demonstrate positive findings, initialize PDCA cycle again with a different plan.

Population Stakeholders and Recruitment Methods

Population

Education on MS will be provided to NPs. Changes in knowledge level will be assessed through a pre-education and post education questionnaire. Because the project lead will not be engaging in direct patient contact, improvement in MS values will be measured through chart audits. Baseline blood pressure, fasting blood glucose, and waist circumference values will be compared with the values measured four-weeks post implementation of the protocol.

Stakeholders

Stakeholders will include an NP located in the Northwest side of Chicago, Illinois. The NP is a board certified Adult Advanced Nurse Practitioner, which specializes in gerontology, long-term care, and home care. A collaborative physician currently supervises her practice until December 31, 2017. After this date, she will be practicing independently. There will be an educational class where MS will be overviewed, and a protocol to manage the cluster of diseases will be presented. The collaborating NP who will have direct patient contact implementing the MS protocol plays a vital role on the success of this project. It is imperative that NPs comprehend the importance of targeting the prevalence of MS, in order to reduce cardiovascular risks within the community. It is noted that the data utilized to measure outcomes for the DNP project will be extracted from the established patient charts in the Northwest Chicago, Illinois clinic.

Setting

The practice site is an adult clinical practice site located in the Northwest Chicago, Illinois. The practice holds over 200 established patients. There are approximately from 15 to 30 patients that are evaluated by the NP on a monthly basis. The majority of patients treated at this practice site are Caucasian, obese, and suffer from multiple comorbidities including diabetes, hypertension, and hypercholesterolemia among others.

Recruitment Methods

The practice site NP will adopt the MS protocol as the new standard of care in her practice. The NP will have direct patient contact with her daily patients scheduled, where she will be counseling patients who meet MS criteria on the new standard of care on MS, and ask for participation in the four-week MS project. Additionally, patients will be identified through chart

audits and called by office staff to schedule an appointment with the NP for MS protocol counseling, and verbally offer participation in the MS project.

Chart audits. A convenience sample of 15 charts will be audited pre and post implementation of the MS protocol. These audits will help identify patients that have MS. Inclusion criteria for chart audits will consist of: patients older than the age of 18 with impaired fasting blood sugar (100-125 mg/dl), hypertension, men with waist circumference greater than forty inches, and woman with waist circumference greater than 35 inches.

Tools and Instrumentation

It is important to educate clinicians using EBP material. By doing so, nurse leaders may utilize the outcomes to introduce innovative ideas to the health care system (Singleton, 2017). A power point presentation will be presented to the NP as an educational tool. It will include definition, risk factors, signs and symptoms, diagnosis, treatment, and protocol all based on evidence based practice. The power point will provide training on the cluster of diseases associated with MS and management.

A handout with MS criteria will be distributed to NP for reference purposes. Additionally, handouts with protocols that contain management information on the entire cluster of disorders associated with MS will be provided to the NP as well. The protocols will include lifestyle modifications such as nutrition, exercise, nutraceutical and pharmaceutical therapy based on EBP. Copies of the protocols will be provided to patients to serve as reference. A pre and post protocol presentation questionnaire will be provided to the NP to measure changes in educational knowledge (See Appendix A). Validity of a tool is of essence; its purpose is to validate how well the instrument is measuring what is intended to measure (Moran, Burson, & Conrad, 2014). The ten-question questionnaire provided to the DNP pre and post education will

be the same, as well as the instructions for completing the questionnaire. The questionnaire will contain questions on MS risk factors, diagnosis, and management. The questionnaire will evaluate the knowledge of the DNP on MS before and after the educational class. Three content experts will be responsible to rate my tool, the content validity index must be a .78 or higher for all three experts in order to be used and considered evidence of good content validity.

Data Collection

Chart audits to assess patient history and diagnoses will take place within the facility to identify patients with current MS diagnoses, and identify patients that meet criteria for MS diagnosis. Patients who meet MS criteria will be asked to volunteer in the MS program by the provider. The NP will manage the patient information; values will be recorded in the chart, and transferred to the value log form, to ensure patient confidentiality (Appendix C). Data collected will be logged in a paper form, and all forms will be stored in the clinical practice site. A follow up call by the NP will take place two weeks post implementation of the protocol where patients will be assessed via phone about their compliance. During the call, the NP and patients can discuss progress and any other concerns the patient may have. Four weeks post implementation, data will be collected on current values and outcomes will be analyzed. The data will be logged in the same documentation form where the original values were documented. After completion of the four-week protocol, new values will be collected and logged by in the forms identified by numbers one to fifteen. The NP and project lead will perform chart audits to obtain new values and compare with original values by pairing data.

Intervention/Project Timeline

There are many activities the project leader is responsible for during the planning and implementation phase of the project. The success of this project relies on effective

communication and collaboration between the project lead and the stakeholder. During the planning and intervention phase, the project lead will conduct charts audits to identify MS patients, develop an educational presentation for the NP that will review the MS program she will be providing to patients.

A project timeline is an illustration, where tasks may be visualized and categorized by dates (Moran, Burson, & Conrad, 2014). The illustration can assist with organization, categorization, and keeping individuals on task. The project timeline will include the following weekly activities:

- Week one- Final stages of data collection process, where blood pressure, waist circumference and fasting blood glucose levels are being recorded thru most current chart audits on patients who meet the criteria for MS. Additionally, the protocol is being revised and summarized into one protocol.
- Week Two- A power point presentation on MS has been presented to the NP. The power point presentation contains the overview of MS, risk factors, signs and symptoms, diagnosis, NP role, plan, and goal. A pre questionnaire was provided before the power point presentation, and a post questionnaire was provided after the power point presentation, to assess NP knowledge prior and after education. The pre and post questionnaire will be analyzed by using the Wilcoxon signed-rank test. The NP will start utilizing protocols as the new standard of care in the practice. NP educated participants on MS and the cluster of diseases associated with it.
- Week three- Impaired fasting glycaemia protocol was presented to NP. A class took place in the facilities classroom on March 19, 2018. There were a total of

ten participants in the class. A second class took place in March 21, 2017. Implementation of protocol started. The initial data of fifteen participants has been collected through chart audits, numbered one to fifteen, and logged in a value log form. The form is stored in the practice site to ensure confidentiality.

- Week four and five- Protocol in place. DNP student continues to collaborate with PM supporting her with educational information and tools on MS.
- Week six- Follow up call to monitor patient's progress will take place. Meeting with PM to assess any questions that may arise.
- Week eight- Post implementation data collection, to measure changes in MS values. The data collection will include blood pressure, waist circumference, and fasting blood glucose. The data will be collected through chart audits and documented on the form where the original values were logged four weeks prior.
- Week nine- Data analysis utilizing SPSS software. Meet with PM to examine post implementation values.

Ethics/Human Subjects Protection

Ethical Protection

The project lead is implementing a protocol for MS patients based on EBP, which will become a new standard of care for the clinical practice. Participants who meet MS diagnosis criteria will be educated on the new protocol by the NP, and asked to volunteer to follow a program for a period of four weeks. Participant information will be strictly confidential; it will be stored at the practice site. Patients will be non-identifiable. The institutional review board (IRB), is responsible for monitoring research and projects who involve human subjects. The IRB ensures

that the propositions are ethical, and that human rights are protected (MUSC College of Nursing, 2013). Since the following project is a QI initiative, it should not require formal IRB approval.

Benefits and Risk

Benefits for NP participants may include knowledge gained from educational activity and improvement in the quality of care provided to patients with MS. Benefits for MS program participants may include potential health benefit from following project protocol. Participants will not be exposed to physical, psychological, social or economic risks or burdens, therefore no risks are expected. An anticipated constraint is participant compliance and dropout rate.

Compensation

There will be no compensation for participation involved since this project is a QI initiative.

Privacy

The project lead will document each participant's data in a paper document, utilizing a non-identifiable labeling form (participant 1, participant 2 etc.), to protect confidentiality. Additionally, subjects can expect their information to be safe by being sorted in the clinical practice and solely shared among NP and project lead.

Plans for Analysis/Evaluation

Metabolic Syndrome Value

Using SPSS software, the plan to analyze the data collected from volunteering participants prior and post protocol implementation will be by utilizing the statistical analysis method Wilcoxon signed-rank test. "The Wilcoxon signed-rank test calculations involve converting the data to ranks, discarding any variance or normality issues associated with the original values" (Grove, Burns, & Gray, 2013, p. 584).

There are three assumptions associated with the Wilcoxon signed-rank test, these include:

1. Dependent variable- The Wilcoxon signed- rank test assesses pre and post - intervention, taking into account individual differences in the baseline. The dependent variable must be at the original or continuous level.
2. Independent variable- the independent variable needs to involve two categorical - groups, related groups and matched pairs. During this DNP project, related groups will be involved because the same subjects will be measure in two occasions.
3. The distribution of the differences between groups must be symmetrical, often plotted in a boxplot.
4. There is no assumption of normality.

NP Knowledge Level

The NP knowledge levels will be assessed through a post- education questionnaire, where the project lead can compare the knowledge on MS and its management before and after education provided to the NP. Additionally, changes in MS values will be assessed by comparing values from pre-implementation of MS protocol in the practice site, to values measured four weeks post-implementation of protocol on 15 participants that agree to follow the new standard of care on MS established in the practice. These two sets of values will be analyzed by using the Wilcoxon signed- rank test, which assesses pre and post an intervention values, measuring changes in baseline. The success of the NP training and protocol will be measured by chart audits on the 15 participants.

Significance/Implications for Nursing

The goal of the final DNP project is to improve future healthcare by developing an MS protocol and educational tool focused on improving NP knowledge and management of MS. This

intervention may improve patient care, resulting in improved patient outcomes. Improving patient knowledge can contribute to better self-care among patients, resulting in healthier health outcomes (Kaur, 2014). The team leader has performed an extensive literature review where the importance of provider education and the lack of patients' knowledge affects patient health are addressed. Evidence based research supports the need for educational programs and other interventions, to assist the population in Illinois who continues to be at risk for CAD. There are numerous risk factors that contribute to the prevalence and incidence of MS (Reppert, Steiner, & Chapman, 2008).

Providing proper education to society related to MS and the diseases associated with it, is of the essence. Increasing knowledge can help individuals understand about the diseases and the long-term complications that are associated with MS. Additionally; a recent study provides evidence of positive outcomes in MS through the use of education. The study found significant improvement in metabolic control by increasing patient awareness and self-management (Suwankruhasn, Pothiban, Panuthai, & Boonchuang, 2013). There is evidence that patients have a better understanding on diseases and its management when providers spent one-on-one time educating patients, and explaining and answering all questions they might have (Ghee & Kooi, 2016).

Analysis

Calculations and analysis of the results were performed using Statistical Package for the Social Sciences (SPSS). A comparison of the pre-post-protocol results was completed. A Wilcoxon Signed Rank Test revealed participants had increased blood glucose levels pre-protocol implementation (Mdn=113.07), than post-protocol implementation (Mdn=103.67). A Wilcoxon Signed Rank Test revealed a statistically significant change in decrease values from pre

implementation to post implementation, this was determined based on the p value (z score), $z = -2.36$ $p < .018$. The p value is less than 0.05; therefore we can reject the null hypothesis and affirm a significant difference between pre, and post protocol implementation (Table 1).

A Wilcoxon Signed Rank Test determined that 13 out of 15 participants improved their fasting blood glucose values post implementation of protocol. Two out of the 15 participants reported increased fasting blood glucose values post implementation of protocol. No values remained the same, hence no ties. The analysis resulted in a statistically significant change post protocol implementation. There were no protocol deviation or violations noted. The results of the quality improvement project demonstrated that patients improved their fasting blood glucose management when they were provided education, and a protocol to follow.

The project lead provided the NP with a pre intervention questionnaire and post intervention questionnaire to assess baseline knowledge level. The pre intervention questionnaire resulted in the NP answering all 10 questions correctly, as well as the same post intervention questionnaire. A Wilcoxon Signed Rank Test revealed zero negative ranks, zero positive ranks, and 10 ties. The p values (z score) resulted in 1.000, which is greater than the null of 0.05. These values demonstrate there was not a statistically significant difference between the values pre and post protocol implementation. There were no protocol deviation or violations noted (Table 2). The results of this analysis proved there was no significant improvement of knowledge post intervention.

Table 1. Descriptive Statistics

N	Mean	Std. Deviation	Minimum	Maximum	Percentiles 25th	Percentiles 50%(Median)	Percentiles 75th
15	113.07	20.944	89	162	99.00	110.00	122.00

15	103.67	35.889	88	189	89.00	95.00	110.00

Table 2. Wilcoxon Signed Ranks Test

		N	Mean Rank	Sum of Rank
Pre-Post	Negative Ranks	13[a]	7.81	101.50
	Positive Ranks	2[b]	9.25	18.50
	Ties	0[c]		
	Total	15		

a. Post < Pre
b. Post > Pre
c. Post = Pre

Table 3. Test Statistics[a]

	Pre - Post
Z	-2.358[b]
Asymp. Sig. (2-tailed)	.018

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Table 4.
Par Tests
NPar Tests
Descriptive Statistics Descriptive Statistics, table, 2 levels of column headers and 1 levels of row headers, table with 9 columns and 5 rows

	N	Mean	Std. Deviation	Min.	Max.	Percentiles 25th	50th	75th

Pre	10	1.00	.000	1	1	1.00	1.00	1.00
Post	10	1.00	.000	1	1	1.00	1.00	1.00

Table 5. Wilcoxon Signed Ranks Test

Pre-Post	N	Mean Rank	Sum of Ranks
Negative Ranks	0[a]	.00	.00
Positive Ranks	0[b]	.00	.00
Ties	10[c]		
Total	10		

a. post < pre

b. post > pre

c. post = pre

Table 6. Wilcoxon Signed Ranks Test
Test Statistics[a] Test Statistics, table, 1 levels of column headers and 1 levels of row headers, table with 2 columns and 6 rows

	Post-pre
Z	.000[b]
Asymp. Sig. (2-tailed)	1.000

a. Wilcoxon Signed Ranks Test

b. The sum of negative ranks equals the sum of positive ranks.

Discussion of the findings

Pre and post- intervention questionnaires were compared to determine project objective attainment. The questionnaire was administered in order to assess baseline knowledge prior to intervention. There was no improvement noted since the pre and post questionnaire both had identical scores. The NP demonstrated to have sufficient knowledge on Metabolic Syndrome.

Studies show continuing medical education has a positive effect on health care providers' performance, and knowledge (Sole M, Panteli D, Risso-Gill, I., Doring, N., Busse, R., McKee, M., & Legido Quigley, H., 2014). It is imperative for all healthcare providers to be well informed on the most current evidence based data information available in order to properly manage and educate patients, resulting in positive outcomes (Grove, S., Burns, N., & Gray, J, 2013). The project lead considered NP MS education and impaired fasting blood glucose protocol presentation to be a very important part of the project, and project outcome.

Impaired fasting glycaemia protocol was presented to the NP and reviewed thoroughly with the project lead. The protocol included risk factors, blood glucose goals, parameters, life style recommendations including exercise activity and diet. The NP engaged the protocol as the new standard of care for her practice. A total of 15 participants attended the group class where the impaired fasting glycaemia protocol was thoroughly reviewed, and pre intervention fasting blood glucose values were recorded. The values recorded post intervention indicated improved fasting blood glucose levels on the majority of the participants who followed the protocol for a period of four weeks. These findings suggest the individuals increased their knowledge as well as self-management practices post intervention. Studies demonstrate the benefits of provider's knowledge and good clinical practice among health care providers have a positive result in patient outcomes (Goel et al., 2017).

Significance/Implication for Nursing

The DNP project's findings are significant for nursing and healthcare. The impaired fasting blood glucose protocol was an important intervention in providing education and guidance to provider and patients. This intervention resulted in an increased self-management of blood glucose levels. The use of a protocol can be used as an adjunct with individual patient

teaching during office visits. Nurse practitioners play a major role in the field of health promotion and disease prevention (Chism, L. A., 2016). The majority of healthcare professionals educate patients during the end of a time restricted appointment, with a possible end result of patients not grasping and retaining the information reviewed (Prouse, J., 2017). Healthcare professionals have the liberty to choose and utilize any educational tool desired. The impaired fasting blood glucose protocol utilized in the project can also serve as an educational reference assisting in delivering valuable patient information.

In the current healthcare system, the goal remains the same: to provide high quality and effective patient care. The fasting blood glucose protocol is a strong tool nurses and other healthcare professionals can utilize to educate and increase patient knowledge on self-managing blood glucose. It is imperative for individuals to become aware of the risks that MS entails. MS predisposes individuals to develop CAD, increasing morbidity and mortality of more than 90 million Americans (American Heart Association, 2017).

Annually, in the U.S. there are about 1.5 Americans who suffer from cardiovascular diseases. Additionally, it is projected that by 2030 the cost for cardiovascular disease in the U.S. will be approximately $818 billion dollars, leading to a great financial burden for the country (Center for Disease Control and Prevention, 2017). Patients with impaired fasting blood glucose have a higher likelihood of developing DM and CAD (American Heart Association, 2017). The impaired fasting blood glucose protocol can contribute to the reduction of CAD morbidity and mortality rates. Ultimately, supporting the Healthy People 2020 goal to improve overall cardiovascular morbidity and mortality rates in the U.S. population, and as well reducing overall U.S. healthcare costs (Center for Disease Control and Prevention, 2016).

Limitations

The DNP final project was a quality improvement (QI) design to evaluate the impact of protocol that was used by the providers caring for patients that were either at risk for MS or currently diagnosed with MS. The project used the Plan-Do-Check-Act (PDCA) cycle. The project included pre and post intervention chart audits to determine patient outcomes. The implementation of an impaired fasting blood glucose

There were several limitations of the project. The first limitation was a small chart audit sample size and the number of providers at the clinic site. The project site is a small family practice consisting of approximately 200 established patients and one provider. Out of the 200 patients approximately 50% had comorbidities associated with MS. The NP implemented the impaired fasting blood glucose protocol as the new standard of care at the practice site. There were limited clinical interactions of the NP, which was due to the number of patient visits and the time limitation of the project. There are studies that have shown the correlation between a larger- sample size, and a decreased margin of error (Science Buddies, 2018). Therefore, the statistical preference is to have a larger number sample size in order to increase the confidence level.

Another limitation included the collection of data methods, specifically possibility of not calibrated glucometers, and incorrect glucose value reporting. The initial collection of data was completed by chart audits, and the collection of blood glucose levels no older than four weeks, which were performed at the practice site. The blood glucose levels were recorded on a log, and stored at the practice site. The NP scheduled follow up visits of patients in order to do a reassessment of fasting blood glucose values. The NP scheduled a total of 11 follow up visits of patients at the practice site which included the provider checking the blood glucose level with the

practice site glucometer. The NP followed up with four patients that were unable to visit the clinic, and the glucose value was reported via telephone. This may have contributed to possible incorrect reporting of values. The literature shows that self-reporting of data may decrease the validity of project (Milikkulainen, K., et al, 2016).

The greatest limitation of the project was the limited timeframe for project implementation. Four weeks was a short amount of time to obtain data. The data collected indicated there were a lower blood glucose levels following the project intervention. However, due to the limited amount of time of the project follow up data may not have indicated a normal blood glucose level in patients as the time frame to achieve this goal was too short. The ideal method for the NP to monitor blood glucose levels is by ordering a Hemoglobin A1C. The A1C levels would provide a more accurate reporting of blood glucose control over the period of the last two to three months. Hence, this project's four-week interval would not-have provided the needed timeframe for Hemoglobin A1C monitoring (American Diabetes Association, 2018).

Lastly, a limitation of the project was the inability to incorporate protocols developed for each of the disease processes associated with MS, due to the complexity of the diseases associated with MS. This lead to the inability to gather data and values associated with each individual disease as originally indented. The impaired fasting blood glucose protocol was the focus of the project there is a strong correlation between pre-diabetes and MS (Grundy, 2012). According to Taveres el. Al, 2016 one of the most important factors to prevent MS is glycemic control.

Dissemination

This project will be disseminated by making the impaired fasting blood glucose protocol available for any clinician who cares for adults over the age of 18, examples being internal

medicine, adult and family practice, and endocrinology. The protocol is directed towards adults from any race and culture that is experiencing elevated blood glucose levels and is at risk for MS. The implementation of the protocol resulted in improved fasting blood glucose levels. Further dissemination includes ongoing utilization of the protocol, at the project site. The project design focused on the PDCA cycle, hence the project lead plans to continue collaboration with the NP at the practice site to monitor patient outcomes, serve as a consultant, and make any necessary modifications to the protocol as instructed by the PDCA cycle (Chism, 2016).

In addition, the dissemination of the project would include providing the impaired fasting blood glucose protocol to interested local healthcare clinics that would like to adopt the protocol as -a standard of care. Finally a plan for future dissemination of the protocol will be developed. The dissemination would include networking with other providers thru local health fairs, local and national conferences such as the American Diabetes Association, and American Heart Association, and the American Association of Clinical Endocrinologist.

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Appendix A

Metabolic Syndrome Education Class Pre and Post Test

Values
1- correct
2- incorrect

1. Metabolic Syndrome is a cluster of conditions that can include:

   a) Dyslipidemia, hypertension, diabetes, renal failure, fibromyalgia
   b) Hypoalphalipoproteinemia, impaired fasting glucose, hypertension, abdominal obesity, hypertriglyceridemia
   C) Hypotension, hypoglycemia, dyslipidemia, anemia, hypomagnesaemia
   d) Hypertension, hypertriglyceridemia, obesity, cardiovascular disease, stroke
   Answer: B

2. Individuals with Metabolic Syndrome are at risk for?

   a) Hypertension
   b) Coronary artery disease and heart attack
   c) Type 2 Diabetes Mellitus
   d) All of the above
   Answer: D

3. Which of the following are risk factors increase the likelihood of acquiring Metabolic Syndrome?

   a) Obesity/Overweight
   b) Insulin resistance
   c) Race and gender
   d) All of the above
   Answer: D

4. How many of the five risk factors associated with Metabolic Syndrome would qualify you with Metabolic Syndrome?

   a) Three
   b) One
   c) Five
   d) Four
   Answer: A

5. Metabolic Syndrome include the following measurements:

a) Triglyceride > 150 mg/dl, HDL < 40 mg/dl (men), < 50 mg/dl (woman), Systolic BP > 130 mm Hg, Diastolic > 85 mm Hg, fasting glucose > 100 mg/dl, abdominal obesity > 40 inches (men), > 35 inches (woman).
b) Triglyceride > 170 mg/dl, HDL > 40 mg/dl (men), < 50 mg/dl (woman), Systolic BP > 130 mm Hg, Diastolic > 85 mm Hg, fasting glucose > 150 mg/dl, abdominal obesity > 40 inches (men), > 35 inches (woman).
c) Triglyceride > 170 mg/dl, HDL > 40 mg/dl (men), < 50 mg/dl (woman), Systolic BP > 130 mm Hg, Diastolic > 85 mm Hg, fasting glucose > 300 mg/dl, abdominal obesity > 40 inches (men), > 35 inches (woman).
d) Triglyceride > 150 mg/dl, HDL > 40 mg/dl (men), < 50 mg/dl (woman), Systolic BP > 130 mm Hg, Diastolic > 85 mm Hg, fasting glucose > 150 mg/dl, abdominal obesity > 40 inches (men), > 35 inches (woman).

Answer: A

6. The American Heart Association recommends the following as treatment and prevention methods for Metabolic Syndrome.

a) Healthy diet
b) Exercise
c) Loose weight
d) All of the above

Answer: D

7. The American Heart Association recommends for individuals to do at least _____ minutes of vigorous activity, in a week period of time.

a) 30 min
b) 150 min
c) 100 min
d) 50 min

Answer: B

8. The prevalence of Metabolic Syndrome continues to increase in the United States?

a) True
b) False

Answer: A

9. Other names for Metabolic Syndrome include

a) Insulin resistance syndrome
b) Obesity syndrome
c) Syndrome X
d) All of the above

Answer: D

10. Does Metabolic Syndrome have and ICD 10 code?

    a) Yes
    b) No
    Answer: A

Appendix B

Impaired Fasting Glucose Protocol

Risk Categories	Goals for Therapy	Clinical Management interventions	Lifestyle Modifications
Risk factors: Obesity Smoking Hypertension Dyslipidemia *Fasting Glucose >100 At risk for Metabolic Syndrome if the patient has 3 or more of the following: *Fasting glucose >100 *Abdominal Obesity Men - Waist circumference > 102 cm /40 in. Women - Waist circumference > 88 cm /35 in. *Blood Pressure ≥ 130/85 * *Triglycerides ≥ 150 *HDL Men < 40 Women < 50	Fasting glucose goal <100mg/dl	**Initial Assessment:** Assess fasting blood sugar If impaired fasting blood sugar • FBS > **100**mg/dl Life style modifications • FBS > **126**mg.dl (on two documented occasions/separate days) lifestyle modification + Consider Metformin (monitor GFR), Recheck fasting blood sugar every 4-6 weeks until stable.	**Recommendations** • Encourage weight loss • Smoking cessation • Encourage daily physical activity • Adequate sleep • Encourage diet Diet: • Low glycemic diet, limit simple carbohydrates, replace for complex carbohydrates • Opt for unsweetened, may use Stevia < 2 /day • Increase fiber consumption • Consume low sugar fruits (berries, apricot, Kiwi) • Keep food log **Exercise:** 30 minutes of moderate-to-vigorous intensity aerobic exercise 5 times a week, or 150 minutes per week. Types of exercises: brisk walk, bicycling, dancing, low-impact aerobics, swimming, stair climbing, jogging, hiking, rowing, skating, and strength training. Week 1: 3 days a week, 20 minutes/day Week 2: 4 days a week, 25 minutes/day Week 3: 5 days week, 30 minutes/day *Expect to loose 1.5 lbs. a week

Appendix C

Pre Implementation Value Form

1. Fasting blood sugar __99___

Blood pressure __142/88___

Waist circumference _48___

2. Fasting blood sugar ___102__

Blood pressure __155/92___

Waist circumference _42___

3. Fasting blood sugar __110___

Blood pressure _120/82____

Waist circumference __36__

4. Fasting blood sugar ___90__

Blood pressure _130/78____

Waist circumference __38__

5. Fasting blood sugar __115___

Blood pressure _117/72____

Waist circumference _42___

6. Fasting blood sugar __162___

Blood pressure __142/89___

Waist circumference __47__

7. Fasting blood sugar __149___

Blood pressure _120/78____

Waist circumference __41__

8. Fasting blood sugar __89___

Blood pressure __142/92___

Waist circumference _37___

9. Fasting blood sugar _102____

Blood pressure __122/80___

Waist circumference __40__

10. Fasting blood sugar __98___

Blood pressure _112/78____

Waist circumference _47___

11. Fasting blood sugar __117___

Blood pressure __130/82___

Waist circumference __36__

12. Fasting blood sugar __122___

Blood pressure _144/88____

Waist circumference _50___

13. Fasting blood sugar _110__

Blood pressure __152/88___

Waist circumference _44___

14. Fasting blood sugar __99___

Blood pressure __110/78___

Waist circumference _40___

15. Fasting blood sugar __132___

Blood pressure _115/78____

Waist circumference __38__

Post Implementation Value Form

1. Fasting blood sugar __95___

Blood pressure __122/82___

Waist circumference _48___

2. Fasting blood sugar ___89__

Blood pressure __142/88___

Waist circumference _41___

3. Fasting blood sugar __115___

Blood pressure _122/80____

Waist circumference __36__

4. Fasting blood sugar ___89__

Blood pressure _122/78____

Waist circumference __36__

5. Fasting blood sugar __89___

Blood pressure _117/80____

Waist circumference _42___

6. Fasting blood sugar __189___

Blood pressure __132/88___

Waist circumference __45__

7. Fasting blood sugar __122___

Blood pressure _125/75____

Waist circumference __42__

8. Fasting blood sugar __88___

Blood pressure __122/78___

Waist circumference _35___

9. Fasting blood sugar _98__

Blood pressure __130/82___

Waist circumference __41__

10. Fasting blood sugar __89___

Blood pressure _120/80____

Waist circumference _47___

11. Fasting blood sugar __99___

Blood pressure __140/82___

Waist circumference __36__

12. Fasting blood sugar __110___

Blood pressure _138/82____

Waist circumference _49___

13. Fasting blood sugar _93____

Blood pressure __122/88___

Waist circumference _44___

14. Fasting blood sugar __88___

Blood pressure __117/79___

Waist circumference _39___

15. Fasting blood sugar __102___

Blood pressure _126/77____

Waist circumference __38__