Utilizing Culturally Congruent Educational Interventions to Improve Native American Diabetic Outcomes

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UTILIZING CULTURALLY CONGRUENT EDUCATIONAL INTERVENTIONS TO
IMPROVE NATIVE AMERICAN DIABETIC OUTCOMES

by

Laurie Ann Hamilton

A Capstone Project
Submitted to the Graduate School
and the Department of Advanced Practice
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Nursing Practice

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December 2016
ABSTRACT

UTILIZING CULTURALLY CONGRUENT EDUCATIONAL INTERVENTIONS TO IMPROVE NATIVE AMERICAN DIABETIC OUTCOMES

by Laurie Ann Hamilton

December 2016

Native Americans suffer from diabetes type II at a proportionately higher rate than other populations. Management of diabetes in this population is problematic and compounded by multiple influences such as socioeconomic, cultural and linguistic variables. The purpose of this DNP project was to investigate cultural influences on Native American diabetic outcomes.

Do cultural influences act as barriers to diabetic medication, diet and education understanding? Would a Native American nurse applied education on medication, diet and exercise improve diabetic outcomes in a 3 month period?

A convenience sample of 6 Native American participants obtained at a primary care clinic were given a Native American nurse applied education intervention. The intervention was preceded by participants taking a pretest, and followed by a post test. Hemoglobin A1c and BMI were measured at baseline, and again at 3 months. Health care recommendations by the baseline provider also were tracked for a 3 month period to see if the patients met those recommendations.

Participant’s post test scores were not significantly improved. Hemoglobin A1c and BMI were not conclusively affected by the Native American nurse education. The initial recommendations for health care were followed by the participants. But the sample did not uniformly have 3 month follow-ups. Data from this project is not sufficient to
determine the benefits of utilizing a Native American Nurse when educating a Native American population. This is partially due to the limited sample size which in turn was influenced by time constraints and low sample recruitment from the population.
ACKNOWLEDGMENTS

I would like to acknowledge the contributions of the Mississippi Band of Choctaw Indians for the use of the facility, staff and resources to implement this project.

I am grateful to Dr. Melanie Gilmore who encouraged and guided me through the process with wisdom and patience. A special thanks to Dr. Anita Boykins for guiding and facilitating this project.

I acknowledge the Jonas Foundation and Morton K. and Jane Blaustein Foundation for their support and contributions to the development of nurse leaders.
DEDICATION

I want to express my appreciation to my supportive husband and daughters; this work is dedicated to you.
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CHAPTER I - INTRODUCTION

This Doctor of Nursing Practice (DNP) project was developed to demonstrate how healthcare providers of similar cultural backgrounds can positively impact patient outcomes in a Native American diabetic population. According to Schim and Doorenbos (2011, p. 1), “culture provides the context for all health care… throughout the human lifespan.” Purnell (2013) agrees health is intrinsically influenced by cultural perspectives. Cultural beliefs are ingrained and health decisions are swayed by these beliefs. In healthcare the cultural perspective of individuals from different cultures is not always identified as possible barriers to compliance. Communicating complex healthcare issues such as diet, exercise, and medication compliance can be challenging in circumstances where the provider and patient are from different cultures. In these cases cultural influences are navigated best by individuals of like culture. The nurse of like culture is especially suited to health care communication due to his/her nursing education and history. The purpose of this DNP Project was to determine if educational interventions provided by nurses of like culture will improve compliance with the prescribed diabetic regimen.

This DNP project was developed to demonstrate how healthcare providers of similar cultural backgrounds can positively impact patient outcomes in a Native American diabetic population. According to Schim and Doorenbos (2011, p. 1), “culture provides the context for all health care… throughout the human lifespan.” Purnell (2013) agrees health is intrinsically influenced by cultural perspectives. Cultural beliefs are ingrained and health decisions are swayed by these beliefs. In healthcare the cultural perspective of individuals from different cultures is not always identified as possible
barriers to compliance. Communicating complex healthcare issues such as diet, exercise, and medication compliance can be challenging in circumstances where the provider and patient are from different cultures. In these cases cultural influences are navigated best by individuals of like culture. The nurse of like culture is especially suited to health care communication due to his/her nursing education and history. The purpose of this DNP Capstone Project was to determine if educational interventions provided by health care workers of like culture will improve compliance with the prescribed diabetic regime.

Nurses are specially trained to recognize health needs and communicate therapeutically with patients for the successful resolution of needs. Nurses of the same culture as their patients are able to recognize cultural issues that block successful resolve of healthcare needs. According to the U.S. Department of Health and Human Services (2006), minority patients do receive better interpersonal care from practitioners of their own race or ethnicity. Therefore, nurses of like culture are well suited to navigate the health care communication landscape with patients who require post diagnosis education. Culture is defined by Purnell (2013) as the total socially transmitted behaviors including beliefs, values, customs life ways and other products of thought which are characteristic of a population and guide their worldview. Our healthcare actions are dictated by our cultural beliefs. This is why culture is so significant in the area of healthcare.

Cultural competence is the condition of the majority of health care events currently practiced. Cultural competence within nursing involves a nurse providing care to a patient from a differing culture and seeking to expand their perspective to encompass those valued by the patient. Typically, these are broad cultural views aimed at avoiding offense to the patient. The transcultural nurse comes from outside the culture and seeks to
understand the cultural perspective of the populations which they serve. However, the transcultural nurse lacks the cultural insights that nurses from within the culture possess. The concept of culturally congruent care involves the health care provider serving the culture from which they arose. For this DNP Project culturally congruent care is Native American nurses interacting with Native American patients from their own tribe.

Diagnoses with high health impact and a long life expectancy require extensive educational intervention. Diagnoses such as diabetes will impact a patient’s health on multiple levels. While lifestyle adaptations can positively impact the patient outcomes and prognosis it requires intense educational communication. Educating the patient in measures to incorporate positive changes in lifestyle will be challenging and require navigation of multiple cultural barriers. Gaining patient commitment to make these changes is crucial. The patient will need to make dietary, exercise and weight loss changes to their lifestyle. Additionally, these patients will need to take medication for the foreseeable future, a prospect which causes many patients distress. Gaining “buy in” from patients with a complex health issue such as diabetes is crucial for their long term health, and reduces the patients and systems health care burden.

Patients with chronic health issues such as diabetes mellitus experience more health morbidity issues than the general population. The Native American population experiences a greater degree of diabetic morbidity than the general population due to higher rates of diabetes prevalence in the population. Diabetes diagnosis among American Indian/American Native (AI/AN) older than 20 years is three to four times (10.9%-15.9%) that for non-Hispanic Whites (3.9%) (Centers for Disease Control and Prevention, 1998). According to the U.S. Department of Health and Human Services’
Indian Health Services (ADA, 2014) Native American Alaskan Natives experienced a 68% increase from 1994-2004 in diabetes among the population aged 15-19 years resulting in an estimated 30% of AI/AN with diabetes.

Chronic conditions represent a significant burden on the health care system in economic expense and man power hours. In a 2012 study regarding the economic impact of diabetes the estimated impact to the United States was $245 billion per year with including $176 billion of that figure representative of direct medical costs and $69 billion in reduced productivity (ADA, 2013). This study does not reflect the pain and suffering associated with the diagnosis or those who have undiagnosed diabetes.

Including Native American nurses in the educational process improves the patient’s chances of successful retention of unfamiliar and complex health information. The Institute of Medicine (IOM) (2013) recommendations encourage diversity in the nursing field so that the patient benefits from such diversity in access to providers with comparable cultural experiences. The goal of the IOM (2013) is to improve empathy, communication and thereby make care to the individual more appropriate.

As a Native American nurse provides healthcare to the culturally consistent population he/she is not subject to linguistic, spiritual and cultural barriers to care. The challenges facing the Native American diabetic patient are better understood by health care professionals from the same culture. Therefore, Native American nurses are better equipped to address cultural and educational barriers due to their training and experience. Native American nurses hold the tools necessary to promote change from a sociocultural and healthcare perspective. What remains to be seen is if a culturally congruent educational intervention provided by these Native American nurses will improve Native
American diabetic compliance. The purpose of this DNP project is to determine if NA nurses caring for NA diabetic patients can improve outcomes.

Purpose Statement

The purpose of the DNP Project was to investigate the effects of Native American nurse educational intervention for NA diabetic patients. In addition to their education by their primary care provider participants received an educational review of ADA (2016), educational tools by a NA nurse, with the objective of overcoming any cultural or linguistic barriers which may have been present. The goal of the project was to identify whether there are significant benefits to having NA type II diabetic patients educated by nurses who are of like culture.

Background and Significance

Geographic Impact

Local. Currently the Mississippi Band of Choctaw Indians; Tribal Primary Care Clinics serves the over 15,000 Mississippi Native Americans (Census, 2010). In this population approximately 16% (ADA, 2015a) are diagnosed as diabetic. This is the highest number of any racial group. The number of Native American’s actually affected by diabetes is believed to be much higher (Berry, Samos, Storti, & Grey, 2009).

According to the Choctaw Health Center data there are approximately 10,000 NA who receive their care from the Mississippi Band of Choctaw Indians (MBCI), Health Centers and Community Clinics. Of this population there are approximately 2000 patients diagnosed as diabetic or pre-diabetic. This data reveals a rate closer to 18% type II diabetics and 2% pre-diabetic for this population.
Among Native American or Alaskan Natives the death rates for diabetes is 1.6 times that of the general U.S. population, 34.5% compared to 21.8% respectively (CDC, 2011). In a 2012 study regarding the economic impact of diabetes the estimated impact to the United States was $245 billion per year with including $176 billion of that figure representative of direct medical costs and $69 billion in reduced productivity (ADA, 2013). The healthcare burden of diabetes on the tribal system is extensive. Improvements in patient compliance to healthcare recommendations can result in improved patient outcomes. These improved outcomes will result in improved patient health, longevity, and reduced health care demands. Implication for the tribal economy includes improved productivity, improved utilization of existing resources and decreased health care burden.

Diabetic patients have on average 2.3 times higher medical expenditures than non-diabetic patients according to the Department of Health and Human Services, (2012). With such a large number of tribal members with diabetes and associated complications the economic burden on the local tribal system is considerable. With improved compliance to medication the local tribal government stands to recoup thousands in expected expenditures. Moneys which can be used in other areas of health care or as the tribe sees fit.

The improved compliance stands to improve workforce productivity. Patients who adhere to their diet and exercise regimes live longer and more productive and independent lives and have fewer sick days than patients who do not comply with diet and exercise regimes (ADA, 2015b). This improved workforce productivity translates to less absenteeism, fewer hospitalizations, fewer disabilities and a decreased loss in
productive capacity due to early mortality (ADA, 2013). The U.S. is estimated to have a lost productivity of $50 billion annually linked to diabetes sufferers (ADA, 2013).

Healthier diabetic patients result in less health care burden. Patients who are healthier require less frequent and less complicated care, fewer hospitalizations and can stay at home longer than patients who do not comprehend their health care needs. This reduction in the patient burden on the health care system means fewer resources are required to provide care to the same number of patients. The result is a more efficient utilization of healthcare dollars.

Regional. In the United South and Eastern tribes of the Nashville Area Indian Health Services there are 29 tribes across 14 states. Among these tribes is the Mississippi Band of Choctaw Indians consisting of multiple tribal communities with one central reservation in which the Tribal Government and hospital is located. This Hospital and its satellite clinics are the major health care suppliers for the local tribal residents from which this researcher plans to draw a convenience sample.

National. There are 566 federally recognized and greater than100 state recognized Native American and Alaskan Native tribes. The federally recognized tribes are provided health assistance through a federal health programs Indian Health Service (IHS), U.S. Department of Health and Human Services. Indian Health Service (IHS) is responsible for the healthcare needs of 2 million of the nation’s 5.2 million American Indian and Alaska Native people, (Sequist, Cullen, & Acton, 2011).

In a 2012 study it was estimated that the fiscal burden of diabetes on the United States is $245 billion per year, which includes $176 billion representative of healthcare costs and $69 billion in reduced productivity (ADA, 2013). This study does not reflect
the pain and suffering associated with a diagnosis of diabetes nor does it include the fiscal impact of individuals who have undiagnosed diabetes. When considering the economic impact of diabetes on the U.S. it is clear this is an area where improvement in patient care may yield a rich financial result.

*Diabetes*

Diabetes is characterized by high blood glucose levels caused by either a lack of insulin or the body's insensitivity to insulin. Type I diabetes is typically identified in the young and is associated with an autoimmune disorder against the cells in the pancreas which produce insulin. Type II diabetes develops most often in middle-aged and older adults but can occur in young people. It is also known as insulin resistance and is a disorder with the cellular uptake of insulin which results in less glucose entering the cells to be used as energy. Insulin must then be increased in the body either by stimulating pancreas production or insulin injection.

*Diabetes in Native Americans*

In 2004 IHS initiated a grant program to fund a demonstration project in Native American communities across the nation. The project was based on the results of the Diabetes Prevention Program (DPP), research involving a large sample of prediabetes individuals conducted in the 1990s. The DPP results revealed dietary changes and exercise are effective in reducing the risk of developing Type II Diabetes. Therefore, measures aimed at improving compliance with diet and exercise can improve diabetic outcomes by reducing long term complications.

Preventing diabetes or its complications is priority, given the excess morbidity suffered by American Indian and Alaska Native people. Co-morbid conditions include

*Implications for Health*

Keeping blood glucose levels as close to normal as possible can prevent or slow the progress of many complications of diabetes, adding years of healthy, active life. Ideally, levels should be maintained between 70 and 130 mg/dl before meals, and less than 180 two hours after meals. Glycated hemoglobin (A1C) level ideally should be less than 7% (ADA, 2015b). However, any improvement in blood glucose levels reduces the risk of long term complications. The Diabetes Control and Complications Trial (DCCT), researchers monitored 1,441 type I diabetics for a number of years (U.S. Department of Health and Human Services, 2005), half the sample persisted in routine diabetic care while half followed a more an intense control regimen. Those in the intense control sample were able to maintain lower blood glucose levels than those receiving typical treatment. In the resultant comparison those patients in the intensive control program had fewer eye, kidney and nerve complications than those patients on standard care. In addition; those who had previously developed some level of these three complications prior to entering the DCCT study experienced rare, if any, progression in the pre-existing condition (ADA, 2015b). Therefore tighter control of blood glucose levels has proven to be a desirable goal.

*Social Determinates of Health*

Social determinants of health comprise the circumstances, in which people are born, grow up, live, work, and age, including the systems that are in place to deal with
illness. These environments are formed by a wider set of economics, social, and political forces. Healthy People 2020, (ODPHD, 2016), has determined health disparities to be those influences which are racially or ethnically based, as well as those which by virtue of the environmental or geographical location, disability, socioeconomic status, age or sex impact the attainment of the highest level of health. The proposed culturally congruent educational intervention is designed in recognition of these social determinates of health. In recognition of the influences of social determinates of health; diabetes prevention strategies should be culturally appropriate and involve community partnerships, (Sequist et al., 2011). Maximizing the environments available to improve health with culturally congruent education involves not only the health systems available but also the inclusion of other aspects of the social determinates of health. The marriage of these may prove to advance patient health.

Social conditions preclude many NA people from living healthy lifestyles (Mitchell, 2012). Transportation, education and financial barriers exist for the appropriation of healthy foods in the home. For instance, one might live miles from the nearest farmers market and have no transportation. These types or real barriers exist for NA patients and their families. This contributes to the increased rates of poorly controlled health issues in Native American communities (Mitchell, 2012).

Cultural Influences

Culture is defined by Purnell (2013) as “the totality of socially transmitted behavioral patterns, arts, beliefs, values, customs, lifeways and all other products of human people work and thought characteristics of a population of people that guide their worldview and decision making” (p. 6). We act upon our beliefs; therefore what we
believe dictates our healthcare actions. This is why culture is so significant in the area of healthcare. It is in our homes that children are taught their world view. An individual undergoes a transformation of worldview to the extent they are willing to interact with the outside world and other cultures.

Exposure to other cultures begins a transformation in our cultural concepts. This beginning is termed cultural awareness or the ability to recognize the physical aspects of differing cultures such as dress, and art. Hopefully for the transcultural nurse this transformation will progress to cultural sensitivity or the ability to communicate with differing cultures without being offensive. As nurses gain experience with a cultural worldview they should develop cultural competence defined by Purnell (2013), as the ability to provide health care in a manner consistent with the patient’s cultural heritage thereby becoming a transcultural nurse. This transcultural nurse has been an invaluable part of the healthcare arena for decades. However, the transcultural nurse coming from outside of a culture to administer care cannot offer the same advocacy, sensitivity or empathy that nurses coming from within the culture can provide.

Purnell (2013), states “culture is largely unconscious and therefore has powerful influence on health and illness” (p. 6). Individuals who have like cultural origins can transmit knowledge, recognize cultural barriers, and communicate to promote skill appropriation and acquisition, as well as advocate for their patients cultural perspectives when appropriate. Certain linguistic and traditional barriers to care are best addressed by nurses who possess both the perspective of the culture and the educational advancement and tools to promote change from a sociocultural perspective.
Saha and Shipman (2006), reviewed 55 studies on the topic of healthcare diversity and found that minority health professionals tend to serve medically underserved populations. The research revealed that minorities typically to receive better interpersonal care from practitioners of their own race or ethnicity.

Cultural traditions such as native healing, medicine men and healers remain a closed section of the Native American culture for the transcultural nurse. Typically, not brought up in care delivery due to the history of cultural imperialism and cultural eradication attempts, the patient may visit the local healer prior to seeking healthcare from the local healthcare provider. As a result motivating toward change of unhealthy traditional treatments remains a challenge for the transcultural clinician serving a tribal population. Native American clinicians hold an advantage in their freedom to communicate on sensitive cultural practices, ability to communicate fluently with both English speaking and native speaking patients and their inclusion in the culture. Combine these abilities with the tools gained through education, the Native American Advanced Practice Nurse has a distinct advantage in the care of Native American population and a unique ability to motivate toward change in an increasing population.

*Linguistic Influences*

Most Native Americans within the Choctaw culture learn their native language first and then English as their second language. In 2012, 20% of American Indians/Alaska Natives spoke a language other than English at home (OMH, 2015). There are subtle nuances in the native languages which can change the meaning of words and therefore impact the understanding of the listener (Purnell, 2013). The nuance of a language is typically learned and mastered in childhood when learning to speak and
frequently is the cause of misunderstanding between speakers. Depending on the inflection and emphasis placed on certain words the hearer understands the meaning and intent of the speaker. A sentence spoken with the emphasis placed on different words can mean different things. This subtle yet key change in the way the word is spoken can greatly affect the understanding of the listener.

The use of interpreters in the healthcare field has long been necessary to promote patient understanding. Recent research has revealed that in the current educational environment of self-study and in the case of complex medical diagnosis translation is less effective (McCabe, Gohdes, Morgan, Eakin, & Schmitt, 2006). Data suggests that with current independent study techniques used to train interpreters the complexities of disease process, diet and exercise regime and treatments of diabetic patients is poorly communicated (McCabe et al., 2006).

Nowhere is the accurate reception of spoken content more imperative than in healthcare, where instructions range from how to comply with a new medication, to a diagnosis impacting prognosis. Most patients prefer to communicate directly their provider rather than through an interpreter. This is especially true when dealing with sensitive healthcare issues. Saha and Shipman (2006) found that non-English speaking clients receive better interpersonal care, experience increased healthcare knowledge, and have an improved adherence to health care recommendations such as follow up care, when care is provided by an individual who speaks their native language.

The Institute of Medicine’s publication Unequal Treatment (IOM, 2003), focused attention toward linguistically appropriate healthcare services as an integral part of culturally congruent care and necessary to addressing health disparities. Providing
culturally congruent services was recognized as indivisible from speaking to the patient in his or her language. Since then the theme has been echoed in national accreditation standards in the fields of both medicine and nursing, in health care policies, and in such legislation as the Affordable Care Act. When updated in 2013 the National CLAS Standards included providing healthcare services to individuals in their “preferred language” as a goal of care. This has become increasingly important in the expanding U.S. Native American population.

*Expanding Population*

Serving the greater than 55,000 Native Choctaws (U. S. Census, 2010), multiplied by the growth rate of this and other Native populations across the U.S. we realize the magnitude of the call for nurses who are able to rise up through the ranks and take their places as nurse leaders in these populations. The U. S. Census (2010) identified 1.7% of all people in the United States as American Indian and Alaska Native, either alone or in combination with one or more other races. Additionally the 2010 U. S. Census numbers reflect expansion of the American Indian and Alaska Native populations in combination by a rapid 39% from 2000 to 2010. This expansion comes in the atmosphere of unsolved health disparity issues experienced by this population.

*Native American Health*

Indian Health Services (IHS) operates the health delivery system for approximately 2 million American Indians and Alaska Natives. This population has less access to healthcare facilities and typically experiences poor health outcomes and multiple co-morbid conditions. Some documented issues which influence these health
outcomes include geographical isolation, cultural barriers, inadequate sewage disposal, and low income (OMH, 2015).

According to the (OMH, 2015), the leading causes of death among NA/AN include heart disease, cancer, accidents, diabetes, and stroke. Additionally, Native American/Alaska Natives experience a high mortality from mental illness, obesity, substance abuse, hepatitis and liver disease. Additionally, Native American/Alaska Natives experience increased infant mortality rates, 60% higher than Caucasians, and have diabetes at a rate two time that of Caucasians, (OMH, 2015).

Needs Assessment

Native Americans experience increased rates of type II diabetes compared to the general population. Additionally, NA diabetics suffer significant morbidity and mortality related to poorly controlled type II diabetes. There are unidentified barriers to consistent medication, diet and exercise adherence. These barriers need to be identified so that plans can be developed for intervention. Research is needed to investigate the source of these barriers. Identification of these barriers can be followed by planned intervention for their removal. Some of these barriers may be in the arena of linguistic or cultural influences. Native American nurses are included in the culture and are aware of broad socio-cultural influences on health care. Problem solving approaches to some of these socio-economic barriers to adherence has been advised by research (Berry et al., 2009). These patients may benefit from an intervention given one on one with a NA nurse provided in a manner consistent with their culture and in the language of their preference in a problem solving format.
Review of Relevant Literature

A comprehensive literature search strategy was used to locate research articles containing information related to Native American diabetes and diabetic education as well as Native American nurses. A search of CINAHL into the topics of diabetes, in title with a mention of education and/or Native American population in the abstract rendered 15 results, only 5 of which were usable. Incorporation of diabetic, Native American or related terms rendered 23 results with 15 usable and 4 previously discovered. Additionally, cultural congruence, Native American and diabetic outcomes were searched together or in combination rendering 20 results, none usable. Recent research or foundational studies investigating diabetic education and Native American diabetics were included. Additionally, the Joanna Briggs Institute EBP Database, ScienceDirect, and Sage, were searched using the search terms; Native American, nurse, minority, minority nurse, and education. The return of 69 articles from CINAHL and ScienceDirect resulted in 17 applicable articles. Included in the research on the topic of culture were quality studies within the last 10 years. Seminal studies were included.

The concepts involved in the development of Native American nurse applied educational interventions to improve Native American type II diabetic patient outcomes combines’ conceptions from multiple studies. Currently in NA tribal clinics diabetes education, tribal social structures and community input in design and content, as well as educational considerations are important concepts guide the development of the intervention. It is also important to recognize the impact of the disease on the population. All of these aspects were included in the review of literature.
Diabetes Health Impact

Diabetes-related mortality for Native Americans populations is higher than for non-Hispanic whites (Cho et al., 2014). Research into American Indians and Alaska Natives (AI/ANs) versus Caucasian causes of death revealed diabetes as a significant contribution or co-morbidity in the causes of death of AI/AN. Data demonstrate that, proportionally, more AI/AN persons died from diabetes, 2.6 to 3.6 times that of Caucasians and at younger ages than Caucasians (Cho et al., 2014).

Diabetes is the leading cause of end stage renal disease (ESRD), accounting for approximately 45% of new cases. Diabetes and dialysis disproportionately affect racial/ethnic minority populations, with 71% in the AI/AN population (Burrows, Cho, McKeeter-Bullard, Narva, & Eggers, 2014). Half of the patients with ESRD attributed to diabetes die within 3 years of beginning dialysis in the United States, primarily because of higher comorbidities, particularly cardiovascular disease (Burrows et al., 2014).

Cardiovascular disease (CVD) is a significant comorbidity which is highly correlated with diabetes. CVD is a leading cause of mortality and a major source of morbidity for American Indian/Native American (AI/AN), diabetics (Moore et al., 2014).

CVD is the leading cause of death among all adults with diabetes, which underscores the need for intensive management of CVD risk factors. However, there are cardiovascular risks associated with tight glycemic control. Hypoglycemia can contribute to poor outcomes in diabetic patients. The effects of hypoglycemia in patients with Type II diabetes are not fully understood. According to Fox et al. (2015) hypoglycemia has been associated with increased heart rate, altered cardiac contractility and output, and may result in cardiac arrhythmias, harmful effects on endothelial function, platelet

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aggregation and resultant coagulation. Increased inflammatory mediators, blood viscosity and lower serum potassium are other detrimental effects identified in this research. Fox et al. (2015), identified further risks for the diabetic patient as sudden death in the patient with myocardial ischemia.

Studies in morbidity rates reveal the numbers are declining, possibly attributable to improved healthcare (Cho et al., 2014; Wilson et al., 2005). While morbidity rates are on the decline, the numbers of new diabetics in the AI/AN populations continue to escalate (Cho et al., 2014). These rising numbers of NA diabetics stand to add a significant burden to the Indian Health Service system and tribal healthcare systems. In an Arizona study Indian Health Services treatment costs for the 10.9% of Native American diabetics accounted for 37.0% of the medical expense incurred between the years of 2004-2005 (O’Connell, Wilson, Manson, & Acton, 2012). The need to intervene to break the spiral of this condition is evident. Reducing disparities in mortality related to diabetes will require developing effective approaches to prevent or control diabetes among AI/AN populations (Cho et al., 2014).

*Educational Aspects*

What interventions should be considered for this population? To answer this question; structure, and content were included in the review of literature. When developing the Native American Diabetes Project (NADP), researchers found “one on one” sessions with NA patients to be as effective and to have a better rate of attendance than group sessions (Griffin, Gilliland, Perez, Helitzer, & Carter, 1999). While later NADP research structures involving group sessions were less attended and the consideration for future research models suggested consultation with tribal members for
input regarding structure and content of the sessions (Griffin, Gilliland, Perez, Upton, & Carter, 2000).

In one qualitative study researchers found the NA diabetic patient requires more guidance in the effective navigation of impediments to health management or healthy lifestyles in the form of improved education and supportive care for the newly diagnosed diabetic patients, as well as their family, with improved emphasis on self-efficacy (Shaw, Brown, Kahn, Mau, & Dillard, 2013). In focus group sessions with Native American elders and diabetics and their families, the results were different between the elders and the diabetic families indicating a possible disconnect from the variables of age or experience (Berry et al., 2009). The diabetic family session participants felt that family support and education was needed, along with a better sharing of medical history within families, nutritious school lunches and nutritional education. The elders’ session identified health and wellness programs, expense of medical supplies, problem solving skills, and self-esteem and community support systems were needed. As a whole the families were focused more on family unit needs and support while elders tended to focus on community empowerment. However, both agreed in a need for stress and time management education (Berry et al., 2009).

Research suggests the diagnosis of diabetes holds certain perceptions for the Native American including: fear of change, necessity of a social support system, lack of awareness or understanding of diabetes and the challenge of changing behaviors while maintaining the integrity of the family (Satterfield et al., 2003). Native Americans also believe interventions should be culturally and historically congruent with the Native American beliefs and traditions (Berry et al., 2009; Satterfield et al., 2003), and that
youth need to be taught healthy lifestyles in interesting and age appropriate manners (Satterfield et al., 2003).

Case Management Models

Using a multidisciplinary case management, and disease management model to improve self-management education among AI/AN communities the SDPI-HH Demonstration Project targeted multiple CVD risk factors in individuals with diabetes (Moore et al., 2014). They were able to demonstrate reduced risk factors for CVD according to the Framingham CHD risk score (Moore et al., 2014).

Community Health Workers

The use of Community Health Workers (CHW) has been proven to successfully improve patient outcomes in the areas of diabetes as well as other NA health issues. CHW are self-described as “in-between” people who act as mediators between the health care and community (Satterfield, Burd, Valdez, Hosey, & Eagle Shield, 2002). These individuals are able to navigate the cultural and linguistic landscape, speak from a position of understanding and respect for local customs and help their community make informed and adaptive health choices (Satterfield et al., 2002).

Theoretical Framework

For this project, Neuman Systems Model, a middle range theory provided a system based perspective, which unifies, is holistic and flexible. In her theory Neuman assumed intersections between person, health, nursing and environment. This is advantageous for research involving a collectivistic population such as the tribal and community perspective of Native Americans.
The environmental and cultural influences for Native Americans tend to be collectivist rather than individualistic with community wellbeing, cultural influences and tribal concerns considered paramount to individual concerns. Therefore the cultural perspectives of “outward in” influences of Neuman’s framework are useful when designing educational events for these individuals. Involving educators with common cultural perspectives maximizes the potential for environmental and cultural understanding and effective communication. Nurses from the community should be able to navigate the complexities of locating resources for diet, and exercise, present tribal, community, and cultural advantages of following regimen recommendations.

Neuman’s Systems Model incorporates the aspects of primary, secondary and tertiary prevention. The goal of healthcare is moving from the current tertiary or secondary model of care which involves the treatment of existing conditions, to the primary prevention model which includes disease prevention. Development of this project incorporates the concepts of moving from tertiary and secondary prevention toward a primary prevention model. Challenging the patients conceptions through education, presents opportunities for changes in patient behavior. Resultant changes in behavior are then practiced in home, work and play. Incorporating these changes of increased exercise, and healthy diet should result in changes in the homes and eventual prevention of or reduction in diabetes type II incidence. Moving toward the primary prevention is the goal, however, there are current implications for tertiary and secondary prevention from this model.

Neuman focuses on the effects of environmental stressors, and their effects on the individual. Environment and stress are seen as interconnected with the belief that stress
can be a positive or negative event. When motivating to change the current perspective patients have toward healthcare issues it is important to bring to a point of crisis. There are situational issues which when understood by the patient should create the crisis and result in the motivation toward change. There must be a clear understanding of the need for change. This is especially true of deeply engrained aspects of an individual lives such as cultural norms. Nurses using the tools for education explain to patients the implications of hemoglobin levels, elevated blood sugars and insulin resistance on the retinal, renal and cardiovascular systems and the resultant deterioration in these systems.

Consideration is given to sociocultural and spiritual aspects of the individual’s perspective, both of which are important considerations for the Native American. Augmentation of community wellbeing, environment and cultural influence are relevant to the research and the implications are pertinent to the application of the research findings. Framing the research project with an appreciation for the spiritual influences inherent in the population’s culture was considered. Involving NA nurses from the community in the educational event incorporates the elements of spiritual practices both traditional medicine and current practices. There is a belief in traditional medicines or healers to be both maleficent and benign. Commonly the health practices of “Healers” or “Medicine men” is sought prior to seeking care from healthcare professionals. It is important to convey an understanding and appreciation for taking responsibility for one’s health while presenting the positive aspects of evidence based care.

NA nurses will be aware of the importance of approaching patients from the perspective of cultural appreciation and respect for traditional views, as well as present alternatives for diet and exercise which are present in the environment as options to
overcome patient barriers. Additionally, NA nurses should be versed in the importance of presenting the advantages for the tribe and community for continued elder influence. In this way the researcher integrated these aspects of the NA diabetic patient and NA nurse culture into the project.

Doctor of Nursing Practice Essentials

The Doctor of Nursing Essentials is the foundation for practice (AACN, 2006). This project met the DNP Essential I by utilizing the Neuman System Model for the application of culturally sensitive intervention to a NA population with a high rate of diabetes type II and the subsequent evaluation of outcomes (1, 2, 3). DNP Essential II was met by the development and implementation of the project. Additionally, the essential was met by the development of the project with consideration of the system; stakeholders, local policies and governmental structure while protecting and advocating for patient needs (1, 2a,e, 3).

DNP Essential III was met by the identification of a health care need in the tribal health care system, research of the topic for evidenced based interventions, followed by synthesis, and compilation of current research for applicability to the population (1, 2, 3, 4). Additionally, Essential III was met by the development of a plan to investigate the current gaps in literature (4), develop an effective and measurable outcome to evaluate the plan when implemented (1, 2, 3, 4, 5) and to utilize current data and data collection techniques to inform the topic (5). The development of a five (5) year sustainable plan to address the health care needs and to disseminate the project information to tribal and healthcare stakeholders, as well as the education of the NA nurse who implemented the education intervention meets likewise meets Essential III (2, 4, 5, 6, 7).
DNP Essential IV was met with the utilization of data collection systems at the tribal health care system to track trends and population sample outcomes (2, 3) and the utilization of current data and data collection systems to inform the topic (1). Essential V was met with identification of a health care need/disparity (2, 4, 7) in the tribal health care system, research in the topic for evidence to guide planned interventions (7), synthesis and compilation of the current literature on the topic (7) and evaluate the research for applicability to the population (2, 7). Additionally, by the development and implementation of the project which considers the system (1, 2, 7), stakeholders (1, 2, 4, 5) and local policies of the tribal healthcare (1, 2, 4, 5), and government (1, 2, 4, 5), while protecting (4, 7) and advocating for patient needs (4, 7).

DNP Essential VI calls for the Advanced Practice Nurse to Inter-professional collaboration for improving population health. This project meets this essential by the education of a NA nurse who implements the intervention (1, 2, 3), implementation of a five (5) year sustainable project to address health care needs and the implementation of a plan to disseminate the information to appropriate tribal and health care personnel (1, 2, 3). Likewise the identification of and resourcing with key stakeholders and tribal government for implementation and resource allocation for project implementation (1, 2, 3) demonstrates the core concepts of Essential VI.

DNP Essential VII addresses the concepts of prevention and population health improvement for the nation. The project demonstrates this essential by identifying the disparity and populations need (1, 2, 3), researching, compilation, and synthesis of current literature and evaluation of the current literature for applicability in this population (1, 2, 3). It also includes the core concepts of culturally sensitive clinical care
to a NA population with a high diabetic percentage and the subsequent evaluation of the outcome (1, 2, 3).

DNP Essential VII addresses the specifics of the Advanced Practice Nurse (APN) role as one that expands the scope of the APN to a wide range of clinical or/and administrative roles. Recognition of a population need, identifying influential factors, gathering relevant literature, and reducing it to the specific factors which impact this population demonstrate the core concepts of systems and analytical thinking skills while demonstrating cultural sensitivity in application of the APN clinical role (1, 2, 4). Additionally, the subsequent development, promotion of the project to the diverse governmental and administrative authorities, and implementation of this project demonstrate an ability to educate and guide diverse groups through complex health care situations (3, 4, 5, 6, 7).

Summary

Native American nurses are uniquely suited to address the disparity needs of NA patients and understand the spiritual, socioeconomic and cultural aspects of their community (Parker, Haldane, Keltner, Strickland, & Tom-Orme, 2002). The history of distrust (Parker et al., 2002), is not a barrier for these nurses who are accepted and respected members of the community. Combine community trust with the therapeutic communication skills taught in nursing schools and the NA nurse becomes the logical choice for education related to healthcare barriers. Employment of the NA nurse in this role is not difficult to envision as nurses are ideally suited to this role. NA nurses possess skills identified as valuable are; communication, interpersonal skills, service coordination, patient education, advocacy and organizational skills along with and the
qualities of empathy, respect, a relationship with the community and desire to help (Satterfield et al., 2002).

Pairing the individualized education, one on one, design of “Community Workers” and “Case Managers” with the problem solving approach incorporates best fit for the educational intervention. Additionally it incorporates evidence based health care practices into the planned intervention. Likewise the “Community Workers” concept of “in between” people fits the role of nurses as patient advocates.
CHAPTER II – METHODS

Population Description

A sample of Native American diabetic patients was collected from individuals who presented to one of the primary care clinics for an Indian Health Services clinic for routine care and communication/education regarding their diabetes. This convenience sample included type II Diabetic mellitus female and male patients between the ages of 21 and 65 with Hemoglobin A1c ≥ 8.0. All participants were established patients of 18 months or greater. This exclusion criterion improves accuracy of the data as well as reduces risk in individuals in whom hypoglycemia may not be advantageous if they begin sudden lifestyle adaptation on various aspects such as insulin management and diet and exercise concurrently.

These age parameters were set because strict control of blood sugars in periods of growth may endanger health (ADA, 2015b). There are risks associated with hypoglycemia in those over 65 years of age. Hypoglycemia has been associated with increased risk of stroke and heart attack; therefore strict management of diabetes may place those individuals over 65 at increased risk (ADA, 2015b). Exclusion criteria also included those patients who are currently on chemotherapy, dialysis or who were terminally ill. The benefits did not outweigh the risk for these patients.

Intervention Preparation

A Native American RN currently employed at the primary care clinic was trained in application of a problem solving approach to type II diabetes medications, diet and exercise by the project director in preparation to participate in the culturally appropriate training of NA diabetic patients. The nurse who is selected attended training in the role,
approach to culturally congruent care, and review of the tools to utilize in the intervention. The NA nurse attended this event during regular work hours and was compensated at the regular rate of pay. The training took place over approximately 1 hour and concepts of confidentiality and confidential communication, informed consent, tool utilization, as well as diabetic healthcare needs were covered. The nurse was trained in the completion of the questionnaire and the importance of asking the patient the questions in the same manner both pre and post intervention. The NA nurse was cautioned to avoid leading the patients in answering the questionnaire.

*Intervention Method*

Patients were selected from the diabetic patients who presented to the clinic. Patients registered following the clinics routine protocol; signing in at the front desk, triaged (vital signs and chief complaint obtained by the appointed nurse, labs ordered and obtained, then placed in the exam room) as usual and protocols followed for patient care as indicated by the patient chief complaint. If the patient’s chief complaint was medication refill for diabetes type II and/or comorbidities, the triage nurse notified the NA nurse trained in the intervention via the most expedient means with the patient location (exam room 1-25). After the patient was seen by the routine provider and after receiving routine care and education the type II diabetic patient who meets the criteria of hemoglobin A1c > 8.0, age 21-65, and BMI> 30.0, was directed to a dedicated room for additional education by a Native American nurse who was trained in application of the ADA (2016), educational materials (Appendix A-J). The patient was offered an option of participation in the intervention and the responsibilities were explained. It was explained to the patient that there would be no difference in the care provided even if the patient
elected not to participate. After obtaining written consent (Appendix K) from the participant, the NA nurse proceeded with the educational intervention. The educational intervention included the Native American nurse reviewing the instructional materials with the patient in a culturally congruent way. Educational materials included diagnostic criteria, problem solving approaches to diet and exercise management, the prescribed medication regime, and importance of monitoring as prescribed (Appendix A-J). The materials were reviewed with the patient in English and/or in Choctaw languages, questions were encouraged, asked and answered in the patient’s language of choice. When the educational intervention was completed the nurse reviewed with the patient the instructions for follow up and confidentiality and concluded the intervention.

**Patient Protection**

The sample was obtained by convenience. All patients meeting the criteria for inclusion were offered participation in the project. Patients received written and oral explanation of the project and written consent to participate in the project was obtained (Appendix K). Once consent was obtained; for the purpose of data collection, the patient’s chart was assigned a number by the researcher. This identification number was recorded on a separate key and kept separate from patient data. Patient data was collected on the data collection worksheet (Appendix L). The data worksheet was free of the patients’ names and had only the assigned identification number. Those participating in the project are only known to this researcher, the NA nurse who provided the intervention and recorded the identification number, and the participant themselves (as well as any family the participant elected to include).
The patient record was reviewed for historical data for the previous 12 months. The historical data was collected for the purpose of comparison of pre and post intervention improvement and included the hemoglobin A1c. Only the hemoglobin A1c was tracked for improvements over the 12-18 month period and compared to the baseline and subsequent (3 months post intervention) values. The purpose was to capture as accurate a reflection of the patient’s patterns over holidays and feasts which may influence the hemoglobin A1c values.

The hemoglobin A1c, BMI, medication refill and follow up history recorded on the Electronic Health Record (EHR) were recorded on the data collection sheet by the researcher. This data was collected for the purpose of comparing follow up attendance, medication refill, and the Hemoglobin A1c at intervention (baseline) with subsequent (3 months) values. This data was collected in on or as near as possible to three (3) months following the intervention. This data was compared to recommendations made by the provider at baseline and reinforced in the intervention.

Patient questionnaires were collected in the intervention by the NA nurse pre intervention and again post intervention requesting their input on the improved understanding of their treatment regimen and disease process. Their responses were true or false answers to a series of questions regarding their health care and medication regimen (see Appendix K). The questions were developed from materials covered in the ADA educational materials which were utilized.

Evaluation of Project Outcomes

Outcomes were considered improved if the participant’s hemoglobin A1c value was lower than the previous year’s values, values at baseline or both. It is believed that
measuring BMI and Hemoglobin A1c will reflect the goal of improved outcomes such as improved medication, health recommendations (screenings, follow ups, appointments and referrals), as well as diet and exercise adherence as a whole. Measures over greater periods of time were outside of the time constraints of this project.

Medication adherence was measured by comparing the medication refills on a monthly cycle as reflected in the health data collection system for the clinic where most NA patients fill their prescriptions. Tracking was only recorded for those medications resulting from direct type II diabetes treatment or its related comorbidities as recommended by the American Diabetes Association (2016). Tracking did not include those medications which were prescribed for symptom management alone (gabapentin, pregabalin), or those medications which were related to other diagnosis such as infections, GI, musculoskeletal, etc., which are not included in the ADA education provided in the intervention (Appendix A-J).

Health recommendations by the provider such as screenings, follow ups, appointments and referrals, related to the type II diabetes diagnosis or related comorbidities: CVD, renal disease, retinopathy, dental treatment and follow ups were recorded as recommendations followed; or recommendations not followed. Diet and exercise were evaluated by BMI comparisons. The BMI obtained at each visit was measured at 3 months and compared to the BMI at the time of education intervention. Reduction in BMI may indicate improvements in diet and exercise understanding. Outcomes were also measured by the patient’s responses to the questionnaire as it reflects understanding of the regimen, and disease.
CHAPTER III - FINDINGS

Project Implementation

This DNP project was planned for completion in spring 2016. However, there were barriers encountered by the Project Director which included gaining “buy in” from healthcare organization, navigation of administration, and tribal governmental permissions. These led to a delay in the project implementation date but were successfully traversed.

Navigation of Tribal Landscape

Initially, there was little interest in the project topic when it was presented to the administrative structure of this IHS clinic. With time investment and development of materials to demonstrate the attractiveness of improving NA nurse utilization for the care of NA patients, and the benefits of having increased NA nurses available from which to draw employees; interest improved. The Project Director was then notified that the Tribal Government would have to pass a Tribal Resolution allowing implementation of the project in the population. The Tribal Chief was approached with materials demonstrating the high impact of type II diabetes on the Native American population and resulting fiscal impact to the tribal economy. Project Director was later directed to Administrative personnel who facilitated my communication with Attorney General for the tribe and plans were made for the Resolution to be presented before the Tribal Council. The Project Director addressed the Tribal Council with the proposed project and the after debate the Resolution was approved.
Administrative approval of the NA nurse who would be available for implementation proceeded. Recruitment, training and implementation proceeded in spring, with measures expected in summer 2016. Space availability was secured.

Sample Description

Sample size was reduced to six (6) when the time allotted for sample collection drew to a close and there were only six (6) participants recruited. The participants were given an educational intervention presented in the language of their choice by a NA nurse who encouraged and answered questions tailoring the education to the participant’s needs and interests within the materials provided (Appendices A-J). The education was provided in a quiet, comfortable and private area set aside for the intervention with healthy snack choices provided. Participants were allowed to bring their significant others if desired. Interruptions were avoided.

Pre/Post Test Scores

The patients were given an eight (8) question true or false pretest which was at or below a 5th grade reading level (Appendix K) before the intervention. The educational intervention was given and the post test was left with the patient to turn into the basket provided before departing the clinic. The patient was allowed to complete the post test at their own pace. Analysis of the data showed improvements in three (3) of the scores from pre-test to post test, declines in one (1) score and two (2) remained the same. Significance was not established for an increase in increased knowledge conveyed in the verbal review and educational presentation for the population by the Native American nurse.
Medications and Follow-up Recommendations

Medication refills and follow-up recommendations as advised in the initial visit interventions were measured monthly for three (3) months. Participants were followed to evaluate initial pick up of prescribed medications post intervention and then monthly refills for three (3) months. Of the six (6) participants, all six (6) picked up the medications on the day of the educational intervention (baseline), while four (4) refilled their diabetic medications monthly (each month for consecutive 3 months).

Follow up recommendations were made by the provider on the initial visit and those recommendations were reinforced by the NA nurse in each participant’s education. The participants who followed up with all recommendations were measured and four (4) of the six (6) participants completed all recommended follow-ups as directed by the initial provider. Three (3) participants had recommendations for one (1) month follow-up, and all three (3) followed up with the recommendations.

BMI and Hemoglobin A1c

Values of the BMI and Hemoglobin A1c were measured at baseline and then again in three (3) months. These were reinforced in the education as part of the provider recommendations. Of the six (6) participants four (4) had BMI’s measured at three (3) months follow up, three (3) had a reduction in BMI, while one (1) had an increase in BMI measurement.

Hemoglobin A1c was measured at baseline and measurements were recommended for all participants at 3 months follow up. The Hemoglobin A1c was repeated on three (3) of the six (6) participants with values increasing as a whole (8.6 to 11, 8.1 to 8.6 and 9.0 to 8.8). Of the participants who were seen at the 3 month follow up,
the Hemoglobin A1c was not ordered by the provider who saw the remaining two (2) participants.

When comparing the Hemoglobin A1c for the participants who returned and had a Hemoglobin A1c obtained, there was a decrease in the values of two (2) participants from the previous year’s values (10.1 to 8.6, 9.2 to 8.8), and an increase in the remaining participant’s value from 5.2 (pre-diabetes value) to 11.0. However, there were already declines in Hemoglobin A1c from 1 year previous to baseline in the three individuals measured. Therefore, there was a trend toward reductions in Hemoglobin A1c in these individuals and may reflect their greater motivation to adhere to healthcare recommendations.

When correlating Hemoglobin A1c values to the BMI, it appears that there may have been a reduction in BMI in those individuals who received NA educational intervention. The relationship between BMI and Hemoglobin A1c values are not reflected as anticipated. One would expect the BMI and the Hemoglobin A1c to have a positive correlation. Anticipating that as BMI increased Hemoglobin A1c would increase and vice versa. However, this is not reflected in this sample and may be due to the small sample size.
Table 1

*Medication and Recommendation Adherence by Month*

<table>
<thead>
<tr>
<th>Participant:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Month 1</strong> (May)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Month 2</strong> (June)</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Month 3</strong> (July)</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><em>F/U: 1 month (May)</em></td>
<td>yes</td>
<td>N/A</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>N/A</td>
</tr>
<tr>
<td><em>F/U: 3 months (July)</em></td>
<td>No</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>NM</td>
<td>I</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td><strong>A1c: 3 month</strong></td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>I</td>
<td>D</td>
<td>I</td>
</tr>
</tbody>
</table>

F/U = Follow up recommendations, I=Increased, D=decreased, NM= Not measured.

Month 1-3 reflect the medications refilled (yes) or not (no) at month 1, 2, or 3

***Compared to a pre-diabetic measurement***
CHAPTER IV -DISCUSSION

Native American patients with diabetes experience higher mortality and morbidity issues than non-native populations (Berry et al., 2009). This project was developed to evaluate the effects of culturally congruent education on outcomes in a diabetic NA population. The concept encompasses the utilization of a NA nurse as the educator for the intervention, thereby providing linguistic, socio-culturally sensitive education in an effort to reduce barriers to adherence and improve outcomes.

The Project Director encountered some temporary resistance and barriers to the approval and implementation of the project. While these barriers were in originally designed to protect the population and avoid wasting valuable resources, the results can be an impediment to research attempts. As the researcher navigated these barriers valuable insight into the administrative and political structure was gained. Such experience includes identification, recruitment and involvement of key stakeholders in research topics, navigation of a political system, resource allocation, defense and debate regarding needs for change and improved outcomes, just to name a few. This experience will help the researcher in the application of future endeavors within a tribal or political landscape.

There were some barriers encountered from the population and the recruitment of willing participants. There are possible historical issues which lead to a resistance in the population, possible unwillingness to commit to the requirements for follow up and/or issues regarding recruitment procedures. The project director personally trained the triage nurses in the manner of recruitment and presentation of the research project. Positives presented in the project presentation were benefits to the patient’s long term outcomes by
increasing knowledge as well as and granting access to a NA nurse to answer specific health care questions.

It became evident in the recruitment period that some triage staff were able to recruit more participants for the project with other triage staff having no recruits in the greater than 1 month time frame. This variation in project presentation style may account for the reduced sample size as well as the other factors mentioned above.

**Interpretation**

There was an increase in the mean Hemoglobin A1c values from baseline to 3 months follow up visit post education implementation (8.5667 to 9.4667 respectively, p=0.27401) in those three (3) individuals who were measured when they returned for follow up at 3 months. Likewise, there were no significant correlations between BMI, Hemoglobin A1c and post test scores.

Data from this research are not sufficient to determine the benefits of utilizing a Native American Nurse when educating a Native American population. Due to the limited sample size and influenced by time constraints and partially a reluctance to be involved in research, the Native American convenience sample obtained was insufficient to demonstrate an improvement in outcomes. Additional obstacles were inconsistent measurement of outcomes. Hemoglobin A1c were inconsistently obtained by the providers who saw the participants in their follow up.

**Implications for Practice**

The researcher has observed a reluctance to be involved in research by the population. Qualitative studies may be helpful to divulge the source of this reluctance. Historically the population has reason to resist the intrusion of non-natives into their
culture. This reason alone may explain the reluctance to participate in research. However, the foundation of knowledge must expand into the culture to reveal barriers to health. Native American researchers may be the answer to this dilemma. More qualitative research is indicated to identify barriers to health care and facilitate eventual plans for removal.

Additional implications include further assessment with a larger sample for this topic. Implications for further research also include measuring outcomes over time utilizing NA versus Non-Native providers, and further investigations into the roles of culture in Native American healthcare.

Conclusion

Utilizing a NA nurse to provide culturally sensitive education to NA diabetic patients reduces trust and linguistic barriers to understanding. Improvements in NA diabetic patients understanding of their medications, diet and exercise needs should improve outcomes in the population. Although, cross cultural care also known as transcultural care, is currently the norm, empowerment and mentoring NA nurses to take leadership roles as Advanced Practice Nurses improves the care available to NA populations. While not determined here, culturally congruent care supplied by trusted and respected nurses from within a patient’s own culture and community, can assist patients to navigate inherent barriers to care with a problem solving approach. Therefore, promoting NA nurse leadership is a goal worthy of continued pursuit.
APPENDIX A – ADA Hypoglycemia

Hypoglycemia

Hypoglycemia, also known as low blood glucose, is when your blood glucose levels have fallen too low. This is usually less than 70 mg/dl. However, talk to your doctor about your own blood glucose targets, and what level is too low for you.

WHEN CAN IT HAPPEN?

Low blood glucose can happen if you’ve skipped a meal or snack, eaten less than usual, or been more physically active than usual. If you don’t take steps to bring glucose levels back to normal, you could even pass out.

WHAT ARE THE SYMPTOMS?

Each person’s reaction to low blood glucose is different. It’s important that you learn your own signs and symptoms when your blood glucose is low.

| Signs and symptoms of low blood glucose begin quickly and include: | Feeling weak, having no energy |
| Feeling shaky | Blurred/impaired vision |
| Being nervous or anxious | Feeling sleepy |
| Sweating, chills, clamminess | Headaches |
| Mood swings, irritability, impatience | Anger, sadness, stubbornness |
| Confusion | Coordination problems, clumsiness |
| Fast heartbeat | Nightmares or crying out in sleep |
| Feeling light-headed or dizzy | Bizarre behavior |
| Hunger, nausea | Seizures |
| Color draining from skin (pallor) | Being unconscious |
| Tingling or numbness in lips, tongue, cheeks |

WHAT SHOULD YOU DO?

If you think you have hypoglycemia, check your blood glucose. If your reading is 70 mg/dl or below, have 15 grams of carbohydrate to raise your blood glucose.

This may be:

- glucose tablets (see instructions)
- gel tube (see instructions)
- 4 ounces (1/2 cup) of juice or regular soda (not diet)
- 1 tablespoon of sugar, honey, or corn syrup
- 8 ounces of nonfat or 1% milk
- hard candies, jellybeans, or gumdrops – see food label for how many to consume

After 15 minutes, check your blood glucose again. If it’s still below 70 mg/dl, have another serving. Repeat these steps until your blood glucose is at least 70 mg/dl. Make a note in your log book about any episodes of low blood glucose and talk with your health care team about why it happened. They can suggest ways to avoid low blood glucose in the future.

Continued on page 2
SEVERE HYPOGLYCEMIA

If left untreated, hypoglycemia may lead to a seizures, unconsciousness (passing out) or coma. In this case, someone else must take over. The people you are in frequent contact with (for example, friends, family members, and coworkers) should be instructed on how to administer glucagon to treat severe hypoglycemic events.

Treating Severe Hypoglycemia

Glucagon is a hormone produced in the pancreas that stimulates your liver to release stored glucose into your bloodstream when your blood glucose levels are too low. Injectable glucagon kits are used as a medication to treat someone with diabetes that has become unconscious from a severe insulin reaction. The only way to administer glucagon is by injection.

Glucagon kits are available by prescription. Speak with your health care provider about whether you should buy a glucagon kit, and how and when to use it.

Steps for treating a person with severe hypoglycemia:

1) The person should inject glucagon (the same way insulin is injected) into the buttock, arm, or thigh, following the manufacturer’s instructions.

2) When you regain consciousness (usually in 5-15 minutes), you may experience nausea and vomiting.

3) If you have needed glucagon, let your health care provider know, so they can discuss ways to prevent severe hypoglycemia in the future.

Don’t hesitate to call 911. If someone is unconscious and glucagon is not available or someone does not know how to use it, call 911 immediately.

Do NOT:

- Inject insulin (will lower blood glucose even more)
- Provide food or fluids (individual can choke)
- Put hands in mouth (individual can choke)

More handouts about this and other topics can be found at http://professional.diabetes.org/PatientEd

For more information visit diabetes.org or call 1-800-DIABETES

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Diabetes Symptoms

TYPE 1 DIABETES
Symptoms of type 1 diabetes are serious and usually happen quickly. Most people with type 1 diabetes will feel very sick because of high blood glucose levels.

Common Signs and Symptoms of Type 1 Diabetes:
• Urinating a lot (as the body tries to flush out excess glucose in the blood)
• Feeling very thirsty (due to dehydration)
• Feeling hungry all the time (because the cells of the body are starved for energy)
• Feeling tired (because the glucose is not entering your cells and being converted to energy)
• Blurred vision (because of a buildup of fluid in the lens of your eyes caused by high blood glucose levels)
• Losing weight suddenly without trying, even with increased appetite (because the body is not able to use the food you eat)
• Nausea and vomiting (as a result of the buildup of ketones in the blood)

Some people with type 1 diabetes may experience diabetic ketoacidosis.

TYPE 2 DIABETES
Type 2 diabetes does not appear suddenly. Instead, you may have no noticeable symptoms or only mild symptoms for years before it is diagnosed.

Common Signs and Symptoms of Type 2 Diabetes:
• Urinating a lot (as the body tries to flush out excess glucose in the blood)
• Feeling very thirsty (due to dehydration)
• Feeling hungry all the time (because the cells of the body are starved for energy)
• Feeling tired (because the glucose is not entering your cells and being converted to energy)
• Blurred vision (because of a buildup of fluid in the lens of your eyes caused by high blood glucose levels)
• Frequent infections or slow healing cuts and sores
• Tingling, pain, or numbness in the hands or feet

WHAT CAN I DO?
Early detection and treatment of diabetes can decrease the risk of developing the complications of diabetes. Talk to your doctor about being tested if you feel like you may have diabetes. Take our Risk Test (www.diabetes.org/risktest) to find out if you are at increased risk for having type 2 diabetes.

More handouts about this and other topics can be found at http://professional.diabetes.org/PatientEd

For more information visit diabetes.org or call 1-800-DIABETES

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Medications for Treating Type 2 Diabetes

The first way to treat type 2 diabetes is often meal planning, weight loss, and exercise. Often these steps are not enough to bring blood glucose levels down to a healthy range. The next step is taking medication that lowers blood glucose levels.

Your doctor will decide which medication is right for you.

This depends on:
- your lifestyle
- physical condition
- how you respond to the medicine
- insurance coverage

ORAL MEDICATIONS

There are different types, or classes, of drugs that work in different ways to lower blood glucose.

**Sulfonylureas**
- chlorpropamide (Diabinese), glipizide (Glucoctol and Glucotrol XL), glyburide (Micronase, Glynase, and Diabecon), glibenpiride (Amaryl)

Sulfonylureas stimulate the beta cells of the pancreas to release more insulin.

**Biguanides**
- metformin (Glucophage)

Biguanides lower blood glucose levels primarily by decreasing the amount of glucose produced by the liver. They also help to lower blood glucose levels by making muscle tissue more sensitive to insulin so glucose can be absorbed.

**Meglitinides**
- repaglinide (Prandin), nateglinide (Starlix)

Meglitinides are drugs that also stimulate the beta cells to release insulin.

**Thiazolidinediones**
- rosiglitazone (Avandia), pioglitazone (ACTOS)

Thiazolidinediones help insulin work better in the muscle and fat and also reduce glucose production in the liver.

**DPP-4 Inhibitors**
- sitagliptin (Januvia), saxagliptin (Onglyza), linagliptin (Tradjenta), alogliptin (Nesina)

DPP-4 inhibitors work by preventing the breakdown of a naturally occurring compound in the body, GLP-1. GLP-1 reduces blood glucose levels in the body, but is broken down very quickly so it does not work well when injected as a drug itself. By interfering in the process that breaks down GLP-1, DPP-4 inhibitors allow it to remain active in the body longer, lowering blood glucose levels only when they are high.

**SGLT2 Inhibitors**
- canagliflozin (Invokana), dapagliflozin (Farxiga), empagliflozin (Jardiance)

Glucose in the blood passes through the kidneys. Sodium-glucose transporter 2 (SGLT2) works normally in the kidney to reabsorb glucose, and SGLT2 inhibitors block this action, causing excess glucose to be eliminated in the urine.

**Alpha-Glucosidase Inhibitors**
- acarbose (Precose), miglitol (Glyset)

Alpha-glucosidase inhibitors help the body to lower blood glucose levels by blocking the breakdown of starches, such as bread, potatoes, and pasta in the intestine. They also slow the breakdown of some sugars, such as table sugar. Their action slows the rise in blood glucose levels after a meal.

**Bile Acid Sequestrants (BAS)**
- colesvelam (Welchol)

The BAS colesvelam is a cholesterol-lowering medication that also reduces blood glucose levels in patients with diabetes.

Continued on page 2
Oral Combination Therapy
Because the drugs listed above act in different ways to lower blood glucose levels, they may be used together. For example, a biguanide and a sulfonylurea may be used together. Many combinations are prescribed together as a single pill for convenience.

INSULIN
There are different types of insulin that vary in how quickly they lower blood glucose levels. Some work very quickly and are taken with meals. Others are long-acting and are used just once or twice a day.

Rapid Acting insulin glulisine (Apidra), insulin lispro (Humalog), insulin aspart (NovoLog)
Onset: about 15 minutes
Peak: about 2 to 4 hours after injection
Duration: last between 2-4 hours

Regular or Short-Acting regular (Humulin R and Novolin R)
Onset: about 30 minutes
Peak: about 2 to 3 hours after injection
Duration: last between 3-6 hours

Intermediate-Acting NPH (Humulin N and Novolin N)
Onset: about 2 to 4 hours after injection
Peak: 4 to 12 hours later
Duration: it is effective for about 12 to 18 hours

Long-Acting insulin detemir (Levemir), Insulin glargine
Onset: between 2 and 4 hours
Peak: long acting insulin has a continuous, “peakless” action that mimics the way your body normally releases insulin
Duration: last up to 24 hours

In 2015 an inhaled insulin product, Afrezza, became available in the U.S. Afrezza is a rapid-acting inhaled insulin. Afrezza must be used in combination with injectable long-acting insulin in patients with type 1 diabetes and in type 2 patients who use long-acting insulin.

Inhaled insulin Technosphere insulin-inhalation system (Afrezza)
Onset: within 12 to 15 minutes
Peak: 30 minutes
Duration: Out of your system in 180 minutes

OTHER INJECTED MEDICATIONS
In addition to pills and insulin, some medications for controlling your blood glucose are injected.

Synthetic amylin pramlintide (Symlin)
Synthetic amylin slows food moving through the stomach. This can decrease appetite and may cause weight loss. It also reduces glucose production by the liver. This keeps after-meal glucose levels from going too high.

GLP-1 analogues exenatide (Byetta and Bydureon), liraglutide (Victoza), albiglutide (Eperzan and Tanzeum), dulaglutide (Trulicity)
GLP-1 analogues stimulate the release of insulin when blood glucose is high and decrease the amount of glucose produced by the liver. They also slow food’s movement through the stomach, which decreases appetite and may lead to weight loss.

WHAT IF MY BLOOD GLUCOSE STAYS TOO HIGH?
If your blood glucose levels remain too high, your medication may need to be adjusted. Do not adjust your medication on your own. Talk to your doctor about possible changes.

More handouts about this and other topics can be found at http://professional.diabetes.org/PatientEd

For more information visit diabetes.org or call 1-800-DIABETES

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Diabetes is a problem with your body that causes blood glucose (sugar) levels to rise higher than normal. This is also called hyperglycemia. When you eat, your body breaks food down into glucose and sends it into the blood. Insulin then helps move the glucose from the blood into your cells. When glucose enters your cells, it is either used as fuel for energy right away or stored for later use. In a person with diabetes, there is a problem with insulin. But, not everyone with diabetes has the same problem.

There are different types of diabetes – type 1, type 2, and a condition called gestational diabetes. If you have diabetes, your body either doesn’t make enough insulin, can’t use insulin it does make well, or both. Diabetes may be treated with insulin, oral medications, exercise, and meal planning. If left untreated, diabetes can lead to several complications, such as nerve damage, kidney or eye problems, heart disease, and stroke. But, if managed well, you can live a long, healthy life with diabetes.

**Type 1**

In type 1 diabetes, your immune system mistakenly destroys the beta-cells, which are the cells in your pancreas that make insulin. Your body treats these beta-cells as foreign invaders and destroys them. The destruction can happen over a few weeks, months, or years. When enough beta cells are destroyed, your pancreas stops making insulin, or makes so little insulin that you need to take insulin to live.

**Type 2**

If you have type 2 diabetes your body does not use insulin properly. This is called insulin-resistance. At first, the beta-cells make extra insulin to make up for it. But, over time your pancreas isn’t able to keep up and can’t make enough insulin to keep your blood glucose at normal levels. Some people with type 2 diabetes can manage their diabetes with healthy eating and exercise. However, your doctor may need to also prescribe oral medications (pills) and/or insulin to help you meet your target blood glucose levels. Diabetes is a progressive disease – even if you don’t need to treat your diabetes with medications at first, you may need to over time.

**Gestational Diabetes**

Gestational diabetes (GDM) is diabetes that develops during pregnancy. For most women, blood glucose levels will return to normal after giving birth. If you’ve had GDM you will need to be tested regularly since you are at much higher risk for developing type 2 diabetes later in life.

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Warning Signs
The following symptoms are typical. However, some people with type 2 diabetes have symptoms so mild that they go unnoticed.
Common symptoms of diabetes:
- Urinating often
- Feeling very thirsty
- Feeling very hungry – even though you are eating
- Extreme fatigue
- Blurry vision
- Cuts/bruises that are slow to heal
- Weight loss – even though you are eating more (type 1)
- Tingling, pain, or numbness in the hands/feet (type 2)

25.8 million Americans have diabetes

Diabetes Management
To manage diabetes, you will work with your health care team to make a plan that helps you reach your goals. Together, you’ll keep track of the ABCs of diabetes:

A is for A1C: Your A1C check tells you your average blood glucose for the past 2 to 3 months. It’s the blood check “with a memory.”

B is for blood pressure: Your blood pressure numbers tell you the force of blood inside your blood vessels. When your blood pressure is high, your heart has to work harder.

C is for cholesterol: Your cholesterol numbers tell you about the amount of fat in your blood. Some kinds, like HDL cholesterol, help protect your heart. Others, like LDL cholesterol, can clog your blood vessels and lead to heart disease. Triglycerides are another kind of blood fat that raises your risk for a heart attack or stroke.

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APPENDIX E – ADA Type II Diabetes

Type 2 Diabetes

WHAT IS DIABETES?
Diabetes is a problem with your body that causes blood glucose (sugar) levels to rise higher than normal. This is also called hyperglycemia.

When you eat your body breaks food down into glucose and sends it into the blood. Insulin then helps move the glucose from the blood into your cells. When glucose enters your cells, it is either used as fuel for energy right away or stored for later use. In a person with diabetes, there is a problem with insulin. But, not all people with diabetes have the same problem.

The types of diabetes are type 1, type 2, and a condition called gestational diabetes, which happens when pregnant. If you have diabetes, your body either doesn’t make enough insulin or can’t use the insulin it does make very well.

WHAT IS TYPE 2 DIABETES?
In type 2 diabetes, your body does not use insulin properly. This is called insulin resistance. At first, the pancreas makes extra insulin to make up for it. Over time your pancreas isn’t able to keep up and can’t make enough insulin to keep your blood glucose levels normal. Type 2 is treated with lifestyle changes, oral medications (pills), and insulin.

Some people with type 2 can control their blood glucose with healthy eating and being active. But, your doctor may need to also prescribe oral medications or insulin to help you meet your target blood glucose levels. Type 2 usually gets worse over time – even if you don’t need medications at first, you may need to later on.

HOW IS TYPE 2 DIFFERENT FROM TYPE 1?
In type 1, your body treats the cells that make insulin as invaders and destroys them. This can happen over a few weeks, months, or years. When enough of the cells are gone, your pancreas stops making insulin, or makes too little insulin.

Without insulin, your blood glucose rises higher than normal, so the insulin needs to be replaced.

WHAT CAUSES TYPE 2 DIABETES?

Scientists do not know the exact cause of type 2 diabetes. However, development of type 2 diabetes has been associated with several risk factors. These risk factors include:

- history of hyperglycemia, prediabetes, and/or gestational diabetes (GDM)
- overweight and obesity
- physical inactivity
- genetics
- family history
- race and ethnicity
- age
- high blood pressure
- abnormal cholesterol

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WHAT TREATMENTS ARE USED FOR TYPE 2 DIABETES?

The two goals of diabetes treatment are to make sure you feel well day-to-day and to prevent or delay long-term health problems. The best way to reach those goals is by:

- taking medications, if your doctor prescribes them
- planning your meals—choosing what, how much, and when to eat
- being physically active

HOW WILL I KNOW IF MY DIABETES TREATMENT IS WORKING?

Getting an A1C test at least twice a year helps you and your health care team keep track of how well you are controlling your blood glucose levels. A1C is part of your diabetes ABCs, which will tell you if your overall diabetes treatment is working. The ABCs of diabetes are:

A: A1C or estimated average glucose (eAG)

Your A1C check tells you your average blood glucose for the past 2 to 3 months. It’s the blood check “with a memory.” Your health care provider may call this your estimated average glucose or eAG. The eAG gives your A1C in the same units (mg/dl) as the glucose meter you use at home.

B: blood pressure

Your blood pressure numbers tell you the force of blood inside your blood vessels. When your blood pressure is high, your heart has to work harder.

C: cholesterol levels

Your cholesterol numbers tell you about the amount of fat in your blood. One type, LDL cholesterol, can clog your blood vessels and lead to heart disease.

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Toolkit No. 5

All About Physical Activity

What can physical activity do for me?
Physical activity
• helps keep your blood glucose (sugar), blood pressure, HDL cholesterol, and triglycerides on target
• lowers your risk for prediabetes, type 2 diabetes, heart disease, and stroke
• relieves stress
• strengthens your heart, muscles, and bones
• improves your blood circulation and tones your muscles
• keeps your body and your joints flexible

Even if you’ve never exercised before, you can find ways to add physical activity to your day. You’ll get benefits, even if your activities aren’t strenuous. Once physical activity is a part of your routine, you’ll wonder how you did without it.

If I haven’t been very active lately, what should I do first?
If you have health problems, start with a check up from your health care provider. Your provider can recommend physical activities that will help you but won’t make your conditions worse.

What kinds of physical activity are best?
A complete physical activity routine includes 3 different kinds of activities:
1. activity—walking, using the stairs, moving around—throughout the day
2. aerobic exercise, such as brisk walking, swimming, or dancing
3. strength training, such as lifting light weights

Being active throughout the day
Being active helps burn calories. Get up and move every 90 minutes if you sit for long periods of time. Place a check mark next to the things you’d like to try:
- Walk instead of drive whenever possible.
- Take the stairs instead of the elevator.
- Walk around while you talk on the phone.
- Work in the garden, rake leaves, or wash the car.
- Play with the kids.
- Carry things upstairs in two trips instead of one.
- Park at the far end of the shopping center lot and walk to the store.
- Others things I can do:

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Aerobic exercise
Aerobic exercise makes your heart and bones strong, relieves stress, and improves blood circulation. It also lowers your risk for type 2 diabetes, heart disease, and stroke by keeping your blood glucose, blood pressure, and cholesterol levels on target.

Aim for about 30 minutes a day, at least 5 days a week. If you haven’t been very active recently, start out with 5 or 10 minutes a day. Then work up to more time each week. Or split up your activity for the day—try a brisk 10-minute walk 3 times each day. If you’re trying to lose weight, you may want to aim for more than 30 minutes a day.

Here are some ways to get aerobic exercise:
• Take a brisk walk every day.
• Go dancing or take a dance aerobics class.
• Swim or do water aerobics.
• Take a bicycle ride outdoors or use a stationary bicycle indoors.

My plan for aerobic exercise:
What I’ll do:

What I need to get ready:

Which days and times:

How long each session will be:

How I’ll warm up and cool down for each session:

Strength training
Strength training helps build strong bones and muscles and makes everyday chores like carrying groceries easier. With more muscle, you burn more calories, even at rest. Do your strength routine several times a week. Here are some ways to do strength training:
• Lift light weights at home.
• Join a class that uses weights, elastic bands, or plastic tubes.
• When you travel, make time to use the hotel fitness center. Or bring lightweight, easy-to-pack resistance bands with you.

My plan for strength training:
What I’ll do:

What I need to get ready:

Which days and times:

How long each session will be:

How to keep a record of your progress
Keep track of your activity. You might find that writing everything down helps keep you on target. Think about what works best for you. You might try a notebook, calendar, spreadsheet, cell phone, or online activity tracker to log and record your progress.

How a support system can help
It may be helpful to meet on a regular basis with others who are also trying to be active. Think about joining a group for exercise or general support. Or find a walking buddy. Then work together to reach your goals.
Diagnosing Diabetes

HOW IS DIABETES DIAGNOSED?

There are several ways to diagnose diabetes. Each way usually needs to be repeated on a second day to diagnose diabetes. Testing should be carried out in a health care setting (such as your doctor’s office or a lab). If your doctor determines that your blood glucose level is very high, or if you have classic symptoms of high blood glucose in addition to one positive test, your doctor may not require a second test to diagnose diabetes.

AIC

The AIC test measures your average blood glucose for the past 2 to 3 months. The advantage of being diagnosed this way is that you don’t have to fast or drink a special drink.

Diabetes is diagnosed at:
AIC: 6.5%

Fasting Plasma Glucose (FPG)

This test is usually done first thing in the morning, before breakfast and checks your fasting blood glucose levels. Fasting means after not having anything to eat or drink (except water) for at least 8 hours before the test.

Diabetes is diagnosed at:
Fasting blood glucose: 126 mg/dl

Oral Glucose Tolerance Test (also called the OGTT)

The OGTT is a two-hour test that checks your blood glucose levels before and 2 hours after you drink a special sweet drink. It tells the doctor how your body processes glucose.

Diabetes is diagnosed at:
2-h blood glucose: 200 mg/dl

Random (also called Casual) Plasma Glucose Test

If you are showing severe diabetes symptoms, your doctor may use a random glucose test.

Diabetes is diagnosed at:
Blood glucose: 200 mg/dl

WHAT IS PREDIABETES?

Prediabetes is a condition when your blood glucose is higher than normal but not high enough to be diabetes. This condition puts you at risk for developing type 2 diabetes.

Results indicating prediabetes are:
- An A1C of 5.7%-6.4%
- Fasting blood glucose of 100-125 mg/dl
- 2-h blood glucose of 140 mg/dl - 199 mg/dl

More handouts about this and other topics can be found at http://professional.diabetes.org/PatientEd

For more information visit diabetes.org or call 1-800-DIABETES
APPENDIX H – ADA Factors Affecting Glucose

Factors Affecting Blood Glucose

Before you had diabetes, no matter what you ate or how active you were, your blood glucose levels stayed within a normal range. But with diabetes, your blood glucose level can rise higher and some diabetes medications can make them go lower than normal. Many factors can change your blood glucose levels. Learning about these can help control your blood glucose levels.

You can use your blood glucose (sugar) levels to make decisions about food and activity. These decisions can help you delay or prevent diabetes complications such as heart attack, kidney disease, blindness, and amputation.

WHAT CAN MAKE MY BLOOD GLUCOSE RISE?

• Too much food, like a meal or snack with more carbohydrates than usual
• Not being active
• Not enough insulin or oral diabetes medications
• Side effects from other medications, such as steroids, anti-psychotic medications
• Illness – your body releases hormones to fight the illness, and those hormones raise blood glucose levels
• Stress, which can produce hormones that raise blood glucose levels
• Short- or long-term pain, like pain from a sunburn – your body releases hormones that raise blood glucose levels
• Menstrual periods, which cause changes in hormone levels
• Dehydration

WHAT CAN MAKE MY BLOOD GLUCOSE FALL?

• Not enough food, like a meal or snack with fewer carbohydrates than usual, missing a meal or snack
• Alcohol, especially on an empty stomach
• Too much insulin or oral diabetes medications
• Side effects from other medications
• More physical activity or exercise than usual – physical activity makes your body more sensitive to insulin and can lower blood glucose.

HOW CAN I TRACK MY BLOOD GLUCOSE?

There are two ways to keep track of your blood glucose levels:

• using a blood glucose meter to measure your blood glucose level at that moment
• getting an A1C at least twice a year to find out your average blood glucose for the past 2 to 3 months

For more information visit diabetes.org or call 1-800-DIABETES

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CONSENT AND INFORMATION FORM

This is an opportunity to participate in research regarding diabetic education. It includes time spent with a Native American nurse who will review American Diabetes Association materials in your preferred language, discuss the health care implications, and review the provider recommendations and health modifications in a culturally sensitive, problem solving approach.

Information:

- Your participation is voluntary.
- Your health information is kept confidential.
- The information will be collected for 1 year previous to study initiation and up to 4 months after and may include labs, vital signs (weight, height, BMI), and health recommendation follow up.
- You will be asked a “yes” or “no” question after the educational intervention via phone or in person.
- Only the researcher will have access to collected health information and it will be de-identified, kept confidential, and destroyed after a period of 6 months.

I, ____________________________ give my consent to participate in this health care study for the length and limits described above.

____________________________  ______________________________
Name                  Date

Nurse instructions: Provide a copy of this signed form to the participant for later review.
# APPENDIX J – Data Collection Tool

## DATA COLLECTION TOOL

**ID Number:**

Did patient feel that the education improved their understanding?  Yes ( )  No( )

<table>
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<tr>
<th>Date</th>
<th>BMI</th>
<th>Hemoglobin A1c</th>
<th>Health Recommendations (screenings, follow ups, appointments and referrals) related to the DM II diagnosis or related comorbidities: CVD, renal disease, retinopathy, dental</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>INITIAL VISIT:</strong> Follow up Recommended? (Yes or No) <strong>SUBSEQUENT VISIT:</strong> Follow up Recommended? (Yes or No) <strong>FOLLOW UP?</strong> (Yes or No) <strong>Doable in time frame?</strong> (Yes or No)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DM II and DM II Recommended Medications</th>
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</thead>
<tbody>
<tr>
<td>Medication Name</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
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<tr>
<td></td>
</tr>
</tbody>
</table>

Notation: Add a * to denote medication supplied that could last longer than the measured 30 days.

Tracking will only be recorded for those medications resulting from direct DM II treatment or its related comorbidities as recommended by the American Diabetes Association. Tracking will not include those medications which are prescribed for symptom management alone (gabapentin, pregabalin), or those medications which are related to other diagnosis such as infections, GI, musculoskeletal, etc., which are not included in the ADA education provided in the intervention.
PRE-TEST/POST-TEST

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>TRUE</th>
<th>FALSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The body needs insulin to be well.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type II diabetics do not make enough insulin.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetic drugs help the body to make more insulin or use it better.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I lose weight my blood sugars may come down.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I keep my blood sugar down I may live well longer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetic drugs help me keep my blood sugar down.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I take my diabetic drugs daily I may stay well longer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I lose weight and keep fit I may be able to reduce the sum of drugs that I need.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
February 13, 2016

Re: Doctoral Capstone Project

To Whom It May Concern:

On January 12, 2016, the Choctaw Tribal Council passed a tribal resolution authorizing a Doctoral Capstone Project to be conducted on the Choctaw Indian Reservation by Laurie Hamilton, FNP-C, student DNP at the University of Southern Mississippi. The implementation of the research project includes a sample size of 35-40 patients with Type II diabetic patients from Choctaw Health Center (CHC) who are seen on any given day in the Primary Care Clinic for refill of medications.

In addition to the current treatment for the diabetic patient, Ms. Hamilton proposes an educational intervention by a Choctaw speaking American Indian nurse who is trained to utilize a tool from the American Diabetes Association website and then follow these patients, in one (1) month intervals for a total of three (3) months, to evaluate their status. Her proposal states the outcomes will be compared to the baseline at intervention as well as Hemoglobin A1c values for 18 months previous, obtaining these values from their health records. Ms. Hamilton has informed hospital administration her hopes to improve medication, and follow up understanding and adherence as well as better outcomes in their health status over the research period.

Sincerely,

Tina Scott
Acting Health Director
Choctaw Health Department
APPENDIX M – IRB Approval Letter

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 21, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.

Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 16033101
PROJECT TITLE: Utilizing Culturally Congruent Educational Interventions to Improve Native American Diabetic Outcomes
PROJECT TYPE: New Project
RESEARCHER(S): Laurie Hamilton
COLLEGE/DIVISION: College of Nursing
DEPARTMENT: Systems Leadership and Healthcare Outcomes
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 03/31/2016 to 03/30/2017
Lawrence A. Hosman, Ph.D.
Institutional Review Board
MISSISSIPPI BAND OF CHOCTAW INDIANS

RESOLUTION CHO 16-014

A RESOLUTION TO APPROVE LAURIE HAMILTON, MSN, FNP, RESEARCH
”UTILIZING CULTURALLY CONGRUENT EDUCATIONAL INTERVENTIONS TO
IMPROVE NATIVE AMERICAN DIABETIC OUTCOMES.”

WHEREAS, Section 1, Subsection (a) of Article VIII of the Revised Constitution and Bylaws of the
Mississippi Band of Choctaw Indians (the “Tribe”) empowers the Tribal Council to negotiate with
and to approve or disapprove contracts or agreements with Federal, State or local governments, with
private persons or with corporate bodies; and

WHEREAS, a diagnosis of Diabetes greatly impacts a tribal member’s health and welfare; and

WHEREAS, patient education and commitment are crucial to the tribal member’s management of
the disease; and

WHEREAS, the researcher proposes to demonstrate that Native American healthcare providers can
positively impact patient outcomes in a Native American diabetic population; and

WHEREAS, the purpose of the project is to identify whether educational interventions provided by
Native American nurses of like culture will improve outcomes for Native American diabetic patients;
and

WHEREAS, the proposal was presented and approved by the Choctaw Health Center Governing
Board on December 15, 2015 at its regular call meeting; and

WHEREAS, it is in the best interest of the Tribe to participate in this project to improve diabetes
health care and management at the Choctaw Health Center; now, therefore, be it

RESOLVED, that the Tribal Council authorizes Laurie Hamilton, MSN, FNP, to proceed with the
proposed research, “Utilizing Culturally Congruent Educational Interventions to Improve Native
American Diabetic Outcomes.” (Attached)

CERTIFICATION

I, the undersigned, as Secretary-Treasurer of the Mississippi Band of Choctaw Indians, certify that
the Tribal Council of said Band is composed of 17 members, 17 of whom, constituting a quorum,
were present at a Regular meeting duly called, noticed, convened, and held this 12th day of January,
2016; and that the foregoing Resolution was adopted by a vote of 17 members in favor, 0 opposed
and 0 abstaining.

Dated this 12th day of January, 2016.
APPENDIX O – American Diabetic Association Copyright Agreement

September 21, 2016

Laurie Hamilton
University of Southern Mississippi,
Doctoral Nurse Program Student

Permission Request Number: K1819116-I-H

Dear Laurie Hamilton:

We are pleased to grant permission (the “Permission”) to you to reprint the following Articles (the “Work”):

- Hypoglycemia
- Diabetes Symptoms
- Diabetes Diagnoses
- Medications for Treating Type 2 Diabetes
- Diabetes an Introduction
- Factors Affecting Blood Glucose
- Type 2 Diabetes
- Physical Activity

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