

INDIAN HEALTH SERVICE CLINIC DIABETES PROTOCOL UPDATE

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Abstract

The constant changes in diabetes guidelines make it difficult to care for high-risk patients, particularly Native Americans. Diabetic patients are generally medically complex, with multiple comorbidities caused by diabetes or closely linked to the disease. In an Indian Health Service in Northern California, the diabetes protocol was outdated, and best care standards were not followed. The project helped to increase the providers' knowledge about the standards of care. The project supported the clinic's primary care providers in their efforts to provide the highest level of diabetic care to the Native American population and all diabetic patients. Meleis et al. (2000) nursing theory of experiencing transitions was applied to this project. Tools used included a pre-survey and a post-survey, namely the Diabetes Attitude Survey from the University of Michigan Diabetes Research and Training Center, given to the providers to complete. Patient data were also collected before and after protocol implementation, including A1c, microalbumin, diabetic retinopathy exam, foot exam, Angiotensin-converting enzyme inhibitors (ACE) or Angiotensin II receptor blockers (ARB) use, and statin use. There was insufficient evidence to suggest significant mean differences between the pre-survey and post-survey. There was a slight increase in the number of foot and eye exams completed pre- to post-implementation. No significant change was noted in A1c measurement, microalbumin measurement, ACE/ARB use, or statin use. This project had several limitations, including a small sample size, a short period for data collection, and high pre-survey diabetes attitude scores. Recommendations for the future include a larger sample size for both the Diabetes Attitude Test and diabetic patients. A more extended period for the study would also be beneficial.

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Chapter I: Introduction

The constant changes in diabetes guidelines make it difficult to care for high-risk patients, particularly Native Americans. Diabetic patients tend to be medically complex, with multiple comorbidities caused by or closely linked to diabetes (Unnikrishnan et al., 2017). Statistically, the Native American population is at a much higher risk of diagnosis with type 2 diabetes and its associated complications than any other racial group in the United States. Native Americans and Alaskan Natives are 12.7 times more likely than white Americans to be diagnosed with diabetes (Centers for Disease Control and Prevention [CDC], 2017).

Diabetes is increasing in Native Americans for multiple reasons. Diabetes diagnoses have increased partly due to an aging population, which raises the risk of new cases. Genetic factors play a part in the incidence of diabetes. Researchers found a link between insulin resistance and chromosomal abnormalities on chromosomes 4q and 7q (Narayan, 2006). Furthermore, modifiable factors such as obesity, dietary contributions, and physical inactivity contribute to diabetes development. Diabetes frequently leads to complications, especially related to other co-morbidities in the Native American population (Narayan, 2006).

Native Americans frequently suffer from chronic kidney disease (CKD) and liver issues related to drugs or alcohol (Bullock et al., 2017). Kidney failure is the most frequent diabetic complication in the Native American population, with two in three Native Americans developing kidney failure from diabetes (CDC, 2017). Kidney failure cost an average of \$82,000 per person in 2013 (CDC, 2017). Native Americans are more likely to have poor outcomes and a higher mortality rate than the national average (CDC,

2017).

Statement of Problem

Diabetes is the most significantly growing morbidity in the United States (American Diabetes Association, 2022), and the Native American population is one of the highest-risk groups in the United States for diabetes (CDC, 2017). With new, quickly changing standards of care, diabetic medications, and approaches to diabetic care, many primary care providers (PCPs) are increasingly uncomfortable with providing care for diabetic patients with multiple other comorbidities (Dong et al., 2016). In an Indian Health Service in Northern California, the diabetes protocol was outdated, and best care guidelines were not being followed, which was not in the best interest of the patients.

Purpose/Aim of the Project

This project aimed to update the diabetes protocol at an Indian Health Service, a Federally Qualified Health Center that provides primary care services, in Northern California to meet American Diabetes Association (ADA) guidelines (ADA, 2022). The project helped to increase the PCPs' knowledge about the guidelines and to support the clinic's PCPs to provide the highest level of diabetic care to the Native American population and all diabetic patients. Providing care according to the current ADA guidelines helps to decrease the poor outcomes associated with diabetes and to increase compliance with the standards of diabetic care. These standards include a hemoglobin A1c of less than seven that is measured every three to six months; an annual microalbumin, a foot exam, and a diabetic retinal exam; use of Angiotensin-converting enzyme inhibitors (ACE) or Angiotensin II receptor blockers (ARB); and use of a statin drug (ADA, 2022). The impact of this study included increased funding to the clinic by

meeting these measures through the government and decreased diabetic complications, costing money and adversely affecting patients' outcomes and lives (Koc et al., 2019).

Background/Problem of Interest Supported by the Literature

Native Americans have a higher morbidity and mortality rate than white Americans. This unequal outcome is primarily attributed to racism and historical trauma, making the Native American population more likely to live in poverty (Johns Hopkins, 2022). In 2010, 5.2 million people in the United States identified as American Indians or Alaska Natives (National Congress of American Indians, 2020). According to the census, there are 63 state-recognized tribes in 11 states and 574 sovereign tribal nations in 35 states. Each of these tribal nations exercises its sovereignty (National Congress of American Indians, 2020). There are 334 federal and state-recognized American Indian reservations and 63 recognized tribes. The Native sovereign tribal nations have a formal nation-to-nation relationship with the U.S. government (National Congress of American Indians, 2020).

The 2010 U.S. Census Bureau indicates that only 20% of American Indians and Alaskan Natives live on reservations. Their largest populations live in urban centers. According to the 2018 Bureau of Labor Statistics, unemployment rates are 6.6% among Native Americans compared to 3.5% among white Americans (U.S. Bureau of Labor Statistics, 2019). This group has a poverty rate of 25%, more than three times that of white Americans. Native Americans also have the lowest educational achievements of all other national and ethnic groups; only 14% of Native Americans hold a bachelor's degree or higher (U.S. Bureau of Labor Statistics, 2019).

From childhood, social determinants of health impact Native Americans'

morbidity and mortality rates (National Indian Health Board, 2020). Children have a high risk of exposure to violence and maltreatment, leading to risky health behaviors and health problems. This population also has an increased risk of exposure to lead and pests. Adolescents are more likely to become victims of violence; use tobacco, alcohol, and other substances; and become obese, which is related to growing up in poverty. Adults have a hard time accessing healthier foods and job security. This population is more likely to work longer hours and experience compressed work weeks and shifts. They are more likely to have reduced job security and frequent part-time and temporary work as opposed to full-time jobs. Working longer hours can lead to a higher risk of harm, heart disease, and digestive disorders. Older adults have difficulty accessing community-based resources and transportation, which in turn increases physical and mental illness risk and death (National Indian Health Board, 2020).

From 2007 to 2008, 64.2% of Native American youth were likely to graduate from high school compared to 81% of white Americans (National Indian Health Board, 2020). Native American youth were also significantly less likely to possess basic health literacy than white Americans. The Native American population is more likely to spend longer time traveling to work or other daily destinations due to their lack of ownership and availability of private vehicles, hence their need to use public transportation. Due to their low socioeconomic status and the above average risk factors, Native Americans are more likely to have cardiovascular disease, arthritis, diabetes, chronic respiratory disease, cervical cancer, and mental distress (National Indian Health Board, 2020).

Significance of the Project

Providers at an Indian Health Service in Northern California provide diabetic care

based on outdated protocols, standards of care, and diabetes management knowledge. The project's significance was to update the protocols based on the newest ADA standards of care and increase the confidence of the PCPs providing diabetes care to diabetic patients, especially those in the Native population. The PICOT question of this project included the following: Did updating a diabetic protocol according to the most current ADA standards of care and educating clinic staff on these standards improve the outcomes of the Native and total diabetic population at an Indian Health Service in Northern California?

Impact of the Project

The project's impact had two aims. The first was to increase the knowledge of the PCPs in the Indian Health Organization in Northern California on the most up-to-date diabetic standards of care according to the ADA to help improve the care they provided to the diabetic population, especially the Native Americans. The second was to improve the diabetic outcomes of the diabetic population in the Indian Health Organization, especially the Native American population, which could improve patient outcomes and increased funding for the clinic. As a result of the project, nursing staff better understood how to provide culturally appropriate diabetic care to the Native American population.

Chapter II: Literature and Theory Review

Diabetes costs \$327 billion annually in medical funding (ADA, 2022). One in ten Americans and one in three Native Americans will develop diabetes in their lifetimes (ADA, 2022). A literature review was completed based on diabetic care in Native Americans, goals of diabetic care, diabetes management, and complications associated with diabetes. Meleis et al. (2000) nursing theory of experience transitions is also addressed and applied to this research project. Databases searched include Cumulated Index to Nursing and Allied Health Literature, Medline Complete, and PubMed.

Literature Review

Primary care providers are suitable for managing diabetes standards of care (Fernando, 2018; Koc et al., 2019). The recommended glycemic control is less than 7.0% to help prevent diabetic complications such as cardiovascular, renal, and retinal issues. (Koc et al., 2019). Diabetes management can include lifestyle modifications, oral medications, insulin, and injectable medications (Doyle-Delagado et al., 2020). Native Americans tend to lean more toward lifestyle management and a natural approach. This population also responds to a multi-disciplinary method, including a dietician, an exercise program, and lifestyle classes (Dong et al., 2016).

Therapeutic Goals

In managing therapeutic goals, first, diabetes must be defined. Impaired fasting glucose is fasting glucose of 100 to 125 mg/dL (ADA, 2022). Prediabetes is an A1c between 5.7% and 6.4%. Type 2 diabetes is an A1c of 6.5% and above. Glycemic control is an A1c of less than 7.0%. Glucose should be monitored by continuous glucose monitoring (CGM) and A1c for best results (ADA, 2022). CGM management should be

considered for those with type 2 diabetes with an A1c of 8.0% or greater (Wright et al., 2021). The combination of A1c management and CGM helps to control diabetes more tightly. A1c does have limitations, including underestimating or overestimating the patient's mean glucose. CGM use and A1c measurement help to decrease cardiovascular complications. By having tighter control over blood glucose and diabetes, the risk of diabetic complications is decreased (Beck & Bergenstal, 2021).

Medication Management

Provides use many medications to treat type 2 diabetes. Providers initially prescribe metformin because it has a low risk of hypoglycemia, no weight gain, and substantial cardiovascular benefits, such as reducing myocardial infarctions (Doyle-Delgado et al., 2020). Metformin can cause gastrointestinal side effects and lactic acidosis in moderate renal disease patients (Fernando, 2018). A patient who fails to achieve the desired results with metformin as a monotherapy (A1c below seven) may benefit from additional medication. Four classes of drugs can be used as adjunctive therapy including dipeptidyl peptidase-4 inhibitors (DDP-4), sodium-glucose cotransporter-2 inhibitors (SGLT2I), sulphonylureas, and thiazolidinediones (Kim et al., 2019).

Sulphonylureas, such as glipizide and glimepiride, are the second choice in diabetic control (Fernando, 2018). PCPs should take precautions when prescribing sulphonylureas for clients diagnosed with chronic kidney disease, as it can cause hypoglycemia. If sulphonylureas are contraindicated, thiazolidinediones, such as pioglitazone, should be considered. Sulphonylureas can also be considered in triple therapy, as indicated. It carries cardiovascular benefits with a shown reduction in

myocardial infarction. Yet it can cause weight gain and fluid retention and should be used cautiously in heart failure. It can be used in end-stage renal disease. DDP-4, such as sitagliptin or linagliptin, can also be considered in dual or triple therapy, as they pose a low risk of hypoglycemia, and have no proven cardiovascular effect and are safe in all stages of chronic kidney disease (Fernando, 2018). SGLT2I, such as empagliflozin, should be considered for adjunctive therapy, as they pose a low risk of hypoglycemia and have shown a reduction in cardiovascular death (Fernando, 2018).

As discussed above, injectables and insulin must be considered if control is still not achieved by the second or third adjunctive therapies (Fonseca et al., 2021). According to Fonesca et al. injectables should be regarded when A1c remains more significant than 9 with combination therapy and should include glucagon-like peptide one receptor antagonists (GLP-1 RAs), particularly Trulicity, Victoza, and Ozempic. Providers should view these as third or fourth-line medications in combination with other medicines and insulin. However, they can lead to significant weight loss and are known for gastrointestinal side effects, including pancreatitis (Fonseca et al., 2021). Yet they significantly decrease cardiovascular disease and can be used in severe renal impairment (Fernando, 2018).

The last drug to consider is insulin, which can be initiated at any point during the patient's diabetic journey. There are two types of insulin, basal insulin and prandial insulin. First, basal insulin should be configured based on the patient's weight or initiated as a standard ten-daily unit and adjusted accordingly (Doyle- Delagado et al., 2020). Titration can occur every few days or until glycemic control is achieved. If hypoglycemia occurs, the cause must be determined, and insulin adjusted accordingly. Prandial insulin

dosing starts at four units or 10% of the amount of basal insulin. Insulin at the most critical meal is a safe place to start, increasing dosage as needed. Again, hypoglycemic episodes should identify a cause and adjust the insulin accordingly (Doyle- Delagado et al., 2020).

Complications

Uncontrolled type 2 diabetes has many potential complications. Cardiovascular risks include the more severe complications (Flamm et al., 2011). With uncontrolled diabetes, an A1c greater than seven, patients are more likely to have a myocardial infarction than those without diabetes. A1c control cuts down on cardiovascular complications. When an A1c is controlled, cardiovascular complications decrease by up to 200% (Flamm et al., 2011). A diabetic person has a one in four chance of suffering a major cardiovascular event (Usman et al., 2021). Patients are more likely to suffer from a cardiovascular event due to the promotion of atherosclerosis and microvascular changes created by uncontrolled type 2 diabetes. Heart failure is also rising with type 2 diabetes (Usman et al., 2021). For every 1% increase in A1c, patients have an increased risk of an 8% to 36% increase in incidence of heart failure. This risk is higher in younger adults and women. Patients with diabetes and heart failure have worse clinical outcomes than those with just heart failure, with a 50% chance of being hospitalized for heart failure (Dunlay et al., 2019).

Another complication associated with type 2 diabetes is chronic kidney disease, which affects 40% of patients with diabetes (Usman et al., 2021) and does not resolve spontaneously (Dagogo-Jack, 2021). A complication of diabetes is end-stage renal disease. Morbidity is as high in chronic kidney disease as in cardiovascular disease in

patients with diabetes; generally, kidney disease has few to no symptoms (Winocour et al., 2020). The goal would be increased screening and surveillance of the disease (Dagogo-Jack, 2021).

Cultural Management

Type 2 diabetes is the leading cause of death among Native Americans, who are twice as likely to have the disease as Caucasians (Simonds et al., 2017). Factors contributing to this includes lifestyle, such as insufficient physical activity and healthy food practices; geographic factors, such as rural areas with poor health services; low socioeconomic status; and genetic risk factors (Dong et al., 2016). Other factors that influence the increase in poor diabetic control are poor communication with the healthcare provider and a strained patient-provider healthcare relationship, which leads to poor medication adherence (Ratner et al., 2017).

Healthcare providers should consider cultural factors when managing Native Americans' care. Many factors are impacted by culture, including managing diet and exercise (Simonds et al., 2017). Modifying the risk factors can decrease morbidity (Dong et al., 2016). Both diabetes intervention and prevention programs can help reduce the risks of diabetes in the Native American population. Programs must run for 18 to 24 months to help decrease diabetic potential and to incorporate long-lasting changes into patients' lifestyles (Dong et al., 2016).

According to Native Americans, active participation in their care contributes to medication and treatment adherence (Ratner et al., 2017). When Native Americans feel empowered, they are more likely to adhere to a well-rounded treatment plan including medications and lifestyle changes (Ratner et al., 2017). Social support has been shown to

positively impact diabetes management (Scarton & de Groot, 2017).

Review of Theory

Meleis et al. (2000) nursing theory of experiencing transitions focuses on health status changes and how they can be enhanced while decreasing a person's risk of illness. The theory focuses on transitions and the experience based on them relating to experiences, interactions, and environmental settings. Nurses are at the center of these transitions regarding their patients' health. Types of transitions include developmental, health and illness, situational, and organizational. They are not necessarily discrete or mutually exclusive; they can also be complex and multidimensional. Several properties exist for transitional experience, including awareness, engagement, change and difference, time span, and critical points and events. Generally, these properties are interrelated (Meleis et al., 2000).

In Meleis et al. (2000) nursing theory of experiencing transitions, humans are considered active beings in which transitions occur. Due to this, personal and environmental conditions must take place for the transition to occur, which includes personal, community, and societal settings. Under personal conditions, cultural conditions are also considered. This theory is used to understand health and healthcare's complex situations (Meleis et al., 2000).

Alignment of Theory

Meleis et al. (2000) nursing theory of experiencing transitions aligns with this study due to its complex nature. The focus is on health promotion and disease prevention through the PCP's ability to understand and apply the ADA's standards of care on diabetes management. This complexity includes providing care to the Native American

population, which leans toward using a natural approach as opposed to medication. This nursing theory helps to coordinate the complexity of diabetes care in today's culturally diverse world. The theory helps apply environmental factors of the clinic along with the patient's transitions of not only clinical interactions with the provider and other healthcare workers but also of their family and even societal transitions, which have a huge impact on diabetes care. It helps provide a well-rounded view of diabetes management, including treatment, personal attitudes toward the disease, and adherence to care. The theory looks at these factors from both the providers' perspective of providing the diabetes care and the patients perspective of receiving the care and applying that to their daily life. Diabetes management is diverse and ever changing. This theory allowed for diversity and constantly changing guidelines because its transitions are multidimensional and not mutually exclusive. This allowed to factor in individualized diabetes care within the proposed diabetic standards of care.

Chapter III: Method

The ADA national diabetes care standards include hemoglobin A1c and microalbumin measurements and foot and retinal exams. Recommended medications for patients diagnosed with diabetes include statin therapy and ACEs or ARBs (ADA, 2022). In accordance with the standards of care, primary care physicians, physicians' assistants, and nurse practitioners are suitable for managing diabetes. However, it can take input from many specialties to effectively care for complicated diabetic patients (Fernando, 2018; Koc et al., 2019). The ADA recommends a glycemic control of less than 7.0% to help prevent diabetes complications such as cardiovascular, renal, and retinal issues. (ADA, 2022). Management can include lifestyle modifications, oral medications, insulin, and injectable medications (Doyle- Delagado et al., 2020).

Design of Project

Using the ADA's type 2 diabetes standards of care, this project assessed and updated a diabetes protocol (Appendix A) for an Indian Health Organization in Northern California (ADA, 2022). First, the project manager secured Institutional Review Board approval from Indiana Wesleyan University (Appendix B), and the protocol was approved by the facility's chief medical officer (Appendix A). Before implementing the diabetic protocol, the organization's PCPs optionally completed the Diabetic Attitude Survey from the University of Michigan Diabetes Research and Training Center (Appendix C). This survey determined their attitude toward treating diabetic patients. The University of Michigan Diabetes Research and Training Center provided permission to use the Diabetic Attitude Survey (Appendix D). To protect confidentiality, participants created an identification number using their birthday and the first three letters of their

mother's name. This number was again used in the post-survey to match the results while performing an analysis. Demographic information was collected, including gender, ethnicity, and role in the clinic during the first survey. The completed surveys were kept in a locked box in the project manager's office.

During a mandatory provider meeting, the project manager presented the updated diabetes standards of care and treatments, and a summary of the new medications via PowerPoint (Appendix E) to the PCPs and other clinic providers, including dietitians. The entire medical department received an education, including certified medical assistants, licensed vocational nurses, and registered nurses, on the latest protocols for diabetes and their role in executing the updated protocol. This education was given at their mandatory staff meeting. After the education, the clinic's chief medical officer made the new protocol mandatory.

The project manager reviewed the protocol with staff at the monthly mandatory meetings to discuss any questions or concerns. Providers repeated the Diabetes Attitude Survey after using the protocol for three months. The project manager measured diabetes standards (Appendix F) three months before and after the protocol change. Diabetic standards were evaluated in both the total clinic diabetic population and the Native American diabetic population (ADA, 2022).

Setting

This project occurred in an Indian Health Service in Northern California. An Indian Health Service is a federally run clinic that provides care to Native Americans through the Indian Health Care Improvement Act. This facility is a primary care clinic serving six main tribes that live in the area and all adult populations.

Population

The population for this project included the medical staff and medical providers. The medical staff was comprised of certified medical assistants, licensed vocational nurses, and registered nurses. Medical providers included medical doctors, physician assistants, nurse practitioners, dietitians, and acupuncturists. Through medical record review, patients diagnosed with type 2 diabetes were also included. No identifiable information was obtained in this population.

Data Collection

The Diabetes Attitude Survey from the University of Michigan Diabetes Research and Training Center explored the attitudes of medical providers toward diabetes. This survey assesses five sub-scales, including need for special training, seriousness of non-insulin dependent diabetes (NIDDM), value of tight control, psychosocial impact of diabetes, and patient autonomy. The Diabetes Attitude Survey has known reliability and validity for a general measure of diabetes-related attitudes, and it is appropriate to compare attitudes among healthcare professionals and patients as well as to evaluate education programs that address the survey's topics (Anderson et al., 1998). This survey was given to the clinic's providers pre- and post-protocol change for them to complete voluntarily. Responses remained confidential to ensure privacy. Information for consent was provided to each participant and implied on completing the survey (Appendix G). Each category was analyzed by comparing the pre- and post-protocol change data to discern any significant change in diabetes standards of care post education and protocol change. Demographic data, including gender, ethnicity, and role, was collected on the first survey. To help determine if patient outcomes improved, patient data were collected

pre- and post-protocol change and education. These data included A1c, microalbumin, diabetic retinopathy exams, foot exams, ACE/ARB use, and statin use.

Resources

The resources needed to complete this project include meeting with the medical staff and providers to educate them on the protocol change. The project manager also met solely with the providers to give them diabetes education during the mandatory clinic staff meetings. Hard copies of the protocol were provided for all medical employees.

Benefits

A potential benefit of this project was positively impacting patient care. The project manager anticipated that diabetic standards of care would be met more frequently. By completing these diabetic standards of care, diabetic complications would be decreased, improving patient outcomes. Another benefit included increasing stakeholder funds. Stakeholders included the tribes the clinic serves. Being an Indian Health Facility, the clinic receives funding by meeting specific measures, including diabetes. Upon improvement of patient outcomes, an increase in financing will occur for the clinic. This money will be redirected into the clinic to support the patients, including its diabetes program.

Risks and Threats

A potential threat to this project was resistance from staff. Change can be difficult, and resistance to change can be expected, particularly resistance to using a new protocol. Another potential risk included an increase in medication costs. The clinic runs the pharmacy, which provides medications to the Native American population. The medication cost rose due to increased compliance with diabetic core measures. A third

possible threat was that the branch opened and used a new electronic health record system around the beginning of this project preventing access to previous data.

Chapter IV: Results

In this project, the diabetes protocol at an Indian Health Service in Northern California was updated to comply with the recommendations of the ADA. Providers completed the Diabetes Attitude Survey from the University of Michigan Diabetes Research and Training Center (Appendix B), before the protocol change and three months after the change. The survey had five subscales: Need for Special Training, Seriousness of NIDDM, Value of Tight Control, Psychosocial Impact of Diabetes, and Patient Autonomy. After reverse scoring, a mean score for each subscale was calculated (Table 1).

Descriptive statistics for the demographic variables included gender, ethnicity, and role. The demographic questions were only included in the pre-survey, so the six subjects who completed only the post-survey are not represented. All participants were Caucasian. Roles included one advanced practice nurse, one physician, and one registered dietician.

Descriptive data (Table 2) was also used to determine any difference in mean of A1c, microalbumin collection, foot exams, eye exams, ACE/ARB use, and statin use before the provider education took place and three months after. Data were collected for the total diabetic population in the clinic and the Native American diabetic population.

No significant mean increases in these subscales pre- and post-survey were determined. Three respondents completed both the pre-survey and post-survey (n=3). While three completed the pre-survey (n=3), six completed the post-survey (n=6). A repeated measures ANOVA in SAS's PROC MIXED was calculated to use all possible data. SAS version 9.4 (SAS Institute, Inc., Cary, NC) was used for all analyses, and a

significance level of $\alpha = 0.05$ was used throughout (Table 1).

Results of Data Collection/Analysis

The survey had five subscales: Need for Special Training, Seriousness of NIDDM, Value of Tight Control, Psychosocial Impact of Diabetes, and Patient Autonomy. After reverse scoring, a mean score for each subscale was calculated.

Diabetes Attitude Survey Analysis

Table 1

Survey Analysis Results of Diabetes Attitude Survey

Subscale		Mean Score	Standard Error	<i>p</i> -value
Need for Special Training	Pre	4.53	0.17	0.42
	Post	4.31	0.14	
Seriousness of NIDDM	Pre	4.24	0.19	0.77
	Post	4.32	0.15	
Value of Tight Control	Pre	4.21	0.19	0.54
	Post	4.02	0.16	
Psychological Impact of DM	Pre	4.39	0.16	0.73
	Post	4.47	0.13	
Patient Autonomy	Pre	4.06	0.15	0.26
	Post	4.38	0.13	

Note. Pre-Survey $n=3$; Post-survey $n=6$.

Model assumptions for each subscale were assessed via residual plots and considered met. In brief, since none of the *p*-values is than 0.05, insufficient evidence suggests significant mean differences between the pre-survey and post-survey for any of the subscales.

Diabetes Standards of Care Analysis

Next, the diabetes measures were collected pre- and post-education to compare the improvement in meeting these core measures in both the total diabetic population of

the clinic and the Native American diabetic population.

Table 2

Diabetes Core Measures

	<u>Total Diabetic Population</u>		<u>Native American Diabetic Population</u>	
	Pre	Post	Pre	Post
Total	677	677	219	219
A1c				
Total Collected	372 (54.9%)	378 (55.8%)	110 (50.2%)	113 (51.6%)
Average	7.5	7.4	7.8	7.9
Microalbumin	264 (39.0%)	247 (36.5%)	83 (37.9%)	85 (38.8%)
ACE/ARB Use	376 (55.5%)	399 (58.9%)	114 (52.15)	115 (52.5%)
Statin Use	421 (62.2%)	436 (64.4%)	106 (48.4%)	117 (53.4%)
Foot Exams	28 (4.1%)	100 (14.8%)	8 (3.75%)	35 (16 %)
Eye Exams	47 (6.9%)	115 (17.0%)	20 (9.1%)	41 (18.7%)

Based on the mean scores, there is insufficient evidence of significant mean differences among A1c, microalbumin measurement, ACE/ARB use or statin use when comparing pre- and post-data for both the total diabetic patient population and the Native diabetic patient population. There was a slight increase in the mean with both foot and eye exams for both the total diabetic population and Native diabetic population.

Implications for Practice

Implications include increasing the knowledge and providers' feelings of comfort with providing diabetes care. With increasing knowledge, diabetes standards of care will more likely be met, and correct care given to diabetic patients. With increased

knowledge, providers are more likely to follow diabetes standards of care and diabetic patients will experience improved outcomes. When these guidelines are followed, and outcomes are improved, funding will be increased for the clinic.

Limitations

Project limitations included a small sample size, a short period for data collection, and high pre-diabetes attitude scores, leaving little room for improvement. Standards of care also change every year, making it difficult to follow the most up-to-date standards in practice. Another limitation was that the period for collecting diabetic standards of care was three months compared to six months or even one year. This occurred because a new EMR was used within six months of starting the project. Additional improved patient care measures could have occurred with a longer data collection period. With limited change in practice, funding will likely not be affected, and patient care will likely continue to not meet current diabetes guidelines.

Recommendations

Recommendations for the future include a larger sample size for both the Diabetic Attitude Test and diabetic patients. A more extended period for the study would also be beneficial. This project needs to be reproduced by the clinic to verify any statistically significant change in diabetes understanding and improvement in the management of diabetes by meeting the current standards of care. By reproducing this study, increase funding could be obtained.

In conclusion, diabetes is a complex medical issue that affects many Americans, especially the Native American population. The guidelines are continuously changing, which makes diabetes care challenging and intimidating to many PCPs. In this project,

the protocol was updated in a Northern California Indian Health Service. The attitude and comfort level of the PCPs was assessed prior to and three months after the protocol change using the Diabetes Attitude Survey. Diabetes standards of care were also measured three months before and three months after the protocol change in the total diabetic population of the clinic and the Native diabetic population of the clinic. Further research is needed to help assess PCP comfort level with diabetes and providing the most up-to-date diabetic care to a vulnerable population.

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Appendices

Appendix A

Updated Policy and Procedure Overview

1. Definitions
 - a. Type 1 Diabetes
 - b. Type 1.5 Diabetes
 - c. Type 2 Diabetes
 - d. Type 3c Diabetes
 - e. Gestational Diabetes
 - f. Prediabetes
2. Diagnosis
 - a. Criteria
 - b. Goals
 - c. Exceptions
3. Labs
 - a. Routine Labs
 - b. Specialized Labs
 - c. Chronic Kidney Disease Labs
 - d. Liver Disease Labs
 - e. Uric Acid
 - f. Scheduling
 - g. Interpreting
 - h. Reporting

4. Self Monitoring
 - a. Goals
 - b. Frequency
 - c. Alternating Sites
 - d. Continuous Glucose Monitoring (CGM)
5. Medication Management
 - a. Diagnostic Criteria
 - b. Metformin
 - c. Oral Medications
 - d. Injectables
 - e. Insulin
 - f. Cardiovascular Disease
 - g. Chronic Kidney Disease
 - h. Obesity
6. Hypoglycemia
 - a. Classification
 - b. Treatment
 - c. Education
7. Hyperglycemia
 - a. Classification
 - b. Treatment
 - c. Education
8. Geriatric and End-Stage Organ Disease

- a. Special Considerations

9. Cardiovascular Disease

- a. Antiplatelet Therapy
- b. Screening
- c. Lipid Management
- d. Blood Pressure

10. Chronic Kidney Disease

- a. Creatinine and eGFR
- b. Urine Albumin
- c. Treatment

11. Chronic Liver Disease

- a. Treatment

12. Ocular Health

- a. Screening (LCTHC)
- b. Treatment (Ophthalmology)

13. Foot/Vascular Health

- a. Podiatry
- b. Vascular
- c. Diabetic Shoe
- d. Education

14. Neuropathy

- a. Screening
- b. Treatment

15. Oral Health

- a. Prevention
- b. Referral

16. Psychiatric Health

- a. Screening
- b. Referral

17. Women's Health

- a. Screening
- b. Osteoporosis
- c. Contraception
- d. Pregnancy

18. Men's Health

- a. Screening

19. Tobacco Dependence

- a. Screening
- b. Referral for Treatment

20. Pulmonary/Sleep Disorders

- a. Screening
- b. Referral
- c. Beta Blockers
- d. Prednisone Protocol

21. Skin

- a. Screening

b. Referral

22. Endocrinology Referral

a. Type 1

b. Type 1.5

c. Type 2

d. Type 3c

23. Substance Abuse

a. Alcohol

b. Meth Abuse

c. Other Substances

24. Obesity

a. Screening

b. Lifestyle Management

25. Immunizations

26. Sick Day Protocol

a. Testing

b. Management

c. ER Management

27. Refill Protocol

a. 30 days

b. Labs

c. Appointment

28. Non-compliance Protocol

29. Medical Nutrition

Appendix B

Indiana Wesleyan University IRB Exemption



Institutional Review Board
4201 South Washington Street
Marion, IN 46953

Tel: 765-677-2090
Fax: 765-677-6647

Notice of Exemption

Indian Health Service Clinic Diabetes Protocol Update
Title of Research Topic

Charissa Barsos, Rhonda Oldham
Investigator(s)

1766.22
IRB ID Number

The IWU Institutional Review Board (IRB) has reviewed your proposal and has determined that your proposal is exempt from further review by the IRB because the proposed project does not constitute human subjects research. Federal regulations that establish the authority of the IRB provide a specific definition of human subjects research which defines the scope of IRB authority. Your project falls outside the federal definition of human subjects research and is therefore not subject to IRB review.

Please note that this exemption regards only the oversight of human subjects research by the IRB. The IRB has not reviewed any other aspects of the research project and makes no judgement on the merits of the project or its methodologies. All research executed at IWU must conform to all applicable state and federal laws and regulations and to all applicable IWU policies.

Comments:

A handwritten signature in blue ink, appearing to read 'Donald Ford'.

Ph.D.

Chair, Institutional Review Board

September 12, 2022
Date

Appendix C

Diabetes Attitude Survey

University of Michigan Diabetes Research and Training Center

Diabetes Attitude Survey

Participation Number: _____

By completing this survey and returning it to the project manager, I am implying that I consent to be a participant in the study.

Below are some statements about diabetes. Each numbered statement finishes the sentence “In general; I believe that...” You may believe that the statement is true for one person but not another person or may be true one time but not right another time. Mark the answer that you believe is true most of the time or is true for most people. Place a check mark in the box below the word or phrase that is closest to your opinion about each statement. It is important that you answer every statement.

Note: The term “health care professionals” in this survey refers to doctors, nurses, and dieticians.

In General I believe that....	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Health care professionals who treat people with diabetes should be well trained to communicate well with their patients.					
2. people who do not need to take insulin to treat their diabetes have pretty mild disease.					
3. there is not much use in trying to have good blood sugar control because the complications of diabetes will happen anyway.					
4. diabetes affects almost every part of a diabetic person’s life.					
5. the important decisions regarding daily diabetes care should be made by the person with diabetes.					
6. health care professionals					

should be taught how daily diabetes care affects patients' lives.					
7. older people with Type 2 Diabetes do not usually get complications.					
8. keeping the blood sugar close to normal can help to prevent the complications of diabetes.					
9. health care professionals should help patients make informed choices about their care plans.					
10. it is important for the nurses and dieticians who teach people with diabetes to learn counseling skills.					
11. people whose diabetes is treated by just a diet do not have to worry about getting many long-term complications.					
12. almost everyone with diabetes should do whatever it takes to keep their blood sugar close to normal.					
13. the emotional effects of diabetes are pretty small.					
14. people with diabetes should have the final say in setting their blood glucose goals.					
15. Blood sugar testing is not needed for people with Type 2 Diabetes					
16. low blood sugar reactions make tight control too risky for most people.					
17. health care professionals should learn how to set foal with patients, not just tell them what to do.					
18. diabetes is hard because you never get a break from it.					

19. the person with diabetes is the most important member of the diabetes care team.					
20. to do a good job, diabetes educators should learn a lot about being teachers.					
21. Type 2 Diabetes is a very serious disease.					
22. having diabetes changes a person's outlook on life.					
23. people who have Type 2 Diabetes will probably not get much payoff from tight control of their blood sugars.					
24. people with diabetes should learn a lot about the disease so that they can be in charge of their own diabetes care.					
25. Type 2 Diabetes is as serious as Type 1 Diabetes.					
26. tight control is too much work.					
27. what the patient does has more effect on the outcome of diabetes care than anything a health professional does.					
28. tight control of blood sugar makes sense only for people with Type 1 Diabetes.					
29. it is frustrating for people with diabetes to take care of their disease.					
30. people with diabetes have a right to decide how hard they will work to control their blood sugar.					
31. people who take diabetes pills should be as concerned about their blood sugar as people who take					

insulin.					
32. people with diabetes have the right not to take good care of their diabetes.					
33. support from family and friends is important in dealing with diabetes.					

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Appendix D

Permission to use Survey:

The Michigan Diabetes Research and Training Center (MDRTC) has developed several survey instruments for diabetes patients and health professionals. By downloading the forms, you are agreeing to acknowledge the MDRTC as the source of the items in the survey instruments in any written instruments, reports, or publications resulting from their use or reproduction.

<http://diabetesresearch.med.umich.edu/peripherals/profs/survey.html#dkt>

Appendix E

Education Summary

- Current ADA Guidelines
- Diabetes Protocol
- Medications
- Statin Therapy
- ACE/ARB Therapy

Appendix F**Patient Data Log**

Core Measures	Total Population Pre-Change	Native Population Pre-Change	Total Population Post-Change	Native Population Post-Change
A1c				
Microalbumin				
Foot Exam				
Eye Exam				
Statin Use				
ACE/ARB Use				

Appendix G

Informed Consent



RESEARCH PARTICIPANT CONSENT FORM

Use this informed consent for studies beginning January 21, 2019, or later.

Title of Project: Indian Health Service Clinic Diabetes Protocol Update

Principal Investigator's Name(s): Charissa Barsos, APN

Research Advisor's Name(s): Dr. Rhonda Oldham

Academic Division/Department: School of Nursing

Section 1: **Purpose of the Research**

The project aims to change the clinic protocol to reflect the current ADA guidelines on type 2 diabetes management and improve diabetic outcomes of the Native American diabetic population and the overall diabetic population.

Section 2: **Specific Procedures to be Used**

Education will be provided about the new diabetes protocol and American Diabetes Association guidelines on Type 2 Diabetes. The expectation will be to incorporate the new protocol and procedures into your everyday practice.

Section 3: **Duration of Participation**

Participation includes a mandatory 1-hour educational session during two staff meetings and an optional pre/post survey from the University of Michigan Diabetes Research and Training Center.

Section 4: **Risks to the Individual**

The risk is minimal but can include anxiety related to completing the surveys and time management issues related to the mandatory protocol change.

Section 5: **Benefits to the Individual or Others**

The benefits are increasing knowledge of diabetes, diabetes treatment, and better patient outcomes. Normal wages will be given for the mandatory meeting during the normal required meeting time. No additional compensation will be provided.

Section 6: **Compensation**

Customary wages will be paid.

Section 7: **Extra Costs to Participate**

There is no extra cost to participate.

Section 8: Injury or Illness

In the event of a medical emergency, emergency services will be contacted.

Section 9: Confidentiality

All surveys will be kept in a locked box in a secured office. Each participant will have a unique number to replace their name on the survey, so each survey is confidential.

Section 10: Voluntary Nature of Participation

I do not have to participate in this research project. If I agree to participate, I can withdraw my participation without penalty.

Section 11: Release

I participate of my own accord in this research project and release any claim to the collected data, research results, or publication in any form, including thesis/dissertation, journal article, conference presentation, or commercial use of such information or products resulting from the collected data.

Section 12: Contact Information

If I have any questions about this research project, I can contact:

Principal investigator:

Charissa Barsos

charissa.barsos@myemail.indwes.edu

Research Advisor

Dr. Rhonda Oldham

rhonda.oldham@myemail.indwes.edu

If I have concerns about the treatment of research participants, I can contact the Institutional Review Board (IRB) at Indiana Wesleyan University, 4201 South Washington Street, Marion, IN 46953. (765) 677-2090.

I HAVE HAD THE OPPORTUNITY TO READ THIS CONSENT DOCUMENT, ASK QUESTIONS ABOUT THE RESEARCH PROJECT, AND AM PREPARED TO PARTICIPATE IN THIS PROJECT.

Participant's Signature: _____

Participant's Name (Type or Print): _____

Date: _____

Investigator's Signature: _____

Date: _____