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A Quality Improvement Initiative to Provide Comprehensive Diabetic Management in a Rural Midwestern Clinic

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Table of Contents

Abstract

An estimated 25.8 million people in the United States (US) have diabetes (Center for Disease Control and Prevention [CDC], 2014). The 2010 Patient Protection and Affordable Care Act led to an increased focus on Quality Improvement (QI) programs to reduce healthcare associated expenditures (Patient Protection and Affordable Care Act, 2010). The purpose of this Doctor of Nursing Practice (DNP) project was to address the following clinical question: Can the comprehensive diabetic bundle of quality metrics for type 2 diabetes mellitus (T2DM) patients in a rural Midwestern clinic be improved through (1) the creation of a QI protocol, (2) increased provider and staff education regarding quality metrics, and (3) the optimal use of QI dashboard software? The DNP project utilized the Donabedian model as the conceptual model to explore the phenomenon of interest, improving the quality of diabetes management. The Promoting Action on Research Implementation in Health Services (PARiHS) framework served as the implementation model to guide the design and development of the implementation strategies to support the evidence-based interventions. The interventions designed to answer this clinical question were: (1) the utilization of the Symphony Performance Health (SPH) QI dashboard software to obtain a T2DM QI metrics baseline, (2) development of a diabetic QI protocol regarding electronic health record (EHR) documentation on diabetes management and optimal SPH QI dashboard software utilization, (3) implementation and evaluation of an educational session intervention on T2DM QI metrics, and (4) the utilization of SPH QI dashboard software to obtain the overall changes in T2DM QI metrics. As a result of these interventions, 5 of 12 (41.6%) diabetic quality metrics were improved with significance ($p = 0.05$). After the implementation of this DNP project, 4 out of 12 diabetic quality metrics have met the National Committee for Quality Assurance (NCQA) QI metric benchmark percentiles. Prior to this DNP

project, only one of the T2DM QI metrics met the NCQA diabetic QI metric benchmark percentiles. This improvement in quality indicator metrics demonstrated the effectiveness of a continuous multicomponent QI initiative to impact care in a rural primary care practice.

Executive Summary

Type 2 Diabetes Mellitus (T2DM) has been described as one of the fastest-growing and most costly chronic diseases (Ali et al., 2016). Management of T2DM requires a collaborative effort between patients and healthcare providers, utilizing evidence-based practice to inform patient self-management of this complex, chronic disease (Collet, Taffé, Bordet, Burnand, & Peytremann-Bridevaux, 2014). To reduce T2DM-related morbidity and mortality, chronic disease management must be a priority. Quality indicators are an appropriate means to assess the progress and quality of diabetes disease management, and incentive programs employing quality improvement (QI) benchmarking demonstrate improvement in provider care delivery (O'Connor et al., 2011). Controlling hemoglobin A1c (A1C), blood pressure, and low-density lipoprotein (LDL) cholesterol lab values has been shown to reduce diabetes-related complications (O'Connor et al., 2011). Various studies have demonstrated that quality-performance measurement, clinician feedback, QI programming, and financial reimbursements have also been associated with sustained improvements of diabetic management across settings (O'Connor et al., 2011).

This purpose of this DNP project was to design and implement QI interventions that would answer the following clinical question: Can the comprehensive diabetic bundle of quality metrics for type 2 diabetes mellitus (T2DM) patients in a rural Midwestern clinic be improved through (1) the creation of a QI protocol, (2) increased provider and staff education regarding quality metrics, and (3) the optimal use of QI dashboard software? The Donabedian model served as the conceptual model utilized to explore the phenomenon of interest, improving the quality of diabetes management.

After completion of an organizational assessment in a Midwestern rural clinic, several issues contributing to the low values on various T2DM QI metrics were identified. These included workflow issues, inability to query electronic health record (EHR) documentation, and limited staff knowledge regarding the importance and purpose of diabetic quality metrics. The Promoting Action on Research Implementation in Health Services (PARiHS) implementation model was used to guide the evidence-based interventions to improve the structure and process (context) components of providing patient care to T2DM patients. An additional benefit of achieving adequate T2DM QI metrics may be the re-instatement of a patient-centered medical home designation, which had been revoked in July of 2016 from the clinic due to various low QI metrics and lack of an on-site medical doctor.

The interventions designed to answer this clinical question were: (1) the utilization of the SPH QI dashboard software to obtain a T2DM QI metrics baseline, (2) development of a diabetic QI protocol regarding EHR documentation on diabetes management and optimal SPH QI dashboard software utilization, (3) the implementation and evaluation of an educational session intervention on T2DM QI metrics, and (4) the utilization of SPH QI dashboard software to assess the overall changes in T2DM QI metrics. The implementation phase of this DNP project was completed on May 10th, 2017. The protocol was developed and adopted by administration and staff, supporting sustainability of the DNP project. The clinic staff also agreed to use the SPH QI dashboard software as a tool to continuously collect and track the progress of the T2DM QI metrics.

As an overall result of these interventions, 5 of 12 (41.6%) diabetic quality metrics were improved with significance ($p= 0.05$), compared to 2 of 12 (16.6%) baseline diabetic quality metric data obtained in March, 2016. After the implementation of this DNP project, 4 out of 12

diabetes quality metrics have met the NCQA target percentiles, whereas only one of the metrics met its NCQA target percentile prior to this DNP project. This improvement in quality indicator metrics demonstrates the effectiveness of a continuous multicomponent QI initiative.

In conclusion, this DNP project demonstrated how utilization of the Donabedian model to explore the phenomenon of interest, improving the quality of diabetes management, can improve the structure and process components, leading to improvements in T2DM QI metrics. This DNP project also demonstrated how the PARiHS framework can be utilized successfully to guide the design and implementation of a diabetic QI initiative by simultaneously impacting the components of facilitation, evidence, and context. This DNP project demonstrated how the interventions of (1) utilizing SPH QI dashboard software to obtain a T2DM QI metric baseline, (2) developing a diabetic QI protocol regarding EHR documentation on diabetes management and optimal SPH QI dashboard software utilization, (3) implementing and evaluating an educational session intervention on T2DM QI metrics, (4) and utilizing SPH QI dashboard software to obtain the overall changes in T2DM QI metrics were effective interventions for improving the quality of diabetic patient management in a rural resource limited clinic. Over time, this QI initiative has the potential to continuously improve patient outcomes and provide increased financial stability to the organization by assisting the DNP project site to improve its structure and processes to provide efficient, high-quality, evidence-based diabetes care.

Introduction and Background

Type 2 Diabetes Mellitus (T2DM) has been described as one of the most costly and fastest growing chronic diseases in the world (Ali et al., 2016). Diabetes Mellitus is a chronic disorder that results in inadequate glucose metabolism and hyperglycemia (Papadakis & McPhee, 2014). T2DM is caused by insulin resistance and deficiencies in the compensatory insulin excretion (Papadakis & McPhee, 2014). This chronic disease has costly implications, both financially and on the physical well-being of a person, in terms of complications when the disease is uncontrolled (Papadakis & McPhee, 2014; Ross et al., 2015).

Globally, an estimated 415 million people have been diagnosed with diabetes, and this number is predicted to reach approximately 592 million by the year 2035 (Ali et al., 2016; Barber, 2016). Rural communities experience a 17% higher prevalence rate of diabetes in comparison to urban communities (Ross et al., 2015). Patients from rural communities encounter multiple factors that influence the management of chronic conditions such as T2DM. Factors include financial constraints, low socioeconomic status attainment, and increased distance from healthcare providers (Ross et al., 2015). T2DM management requires collaboration between patients and healthcare providers and the use of evidence-based interventions to assist patient self-management of this complex, chronic disease (Collet, Taffé, Bordet, Burnand & Peytremann-Bridevaux, 2014).

Quality Improvement (QI) strategies that focus on the systematic management of chronic disease have been shown to be particularly effective at achieving optimal patient treatment goals (Rushforth, McCrorie, Glidewell, Midgley, & Foy, 2016). The National Committee for Quality Assurance (NCQA) and the Centers for Medicare and Medicaid Services (CMS) have compiled evidence on quality indicators and T2DM management demonstrating that control of hemoglobin

AIC less than 7%, lipids, and blood pressure can drastically reduce the risk of T2DM complications, including renal failure, amputation, and macrovascular events (O'Connor et al., 2011). To reduce T2DM-related morbidity and mortality, chronic disease management must be a priority. Quality indicators are an appropriate means to assess the progress and quality of disease management.

The DNP project site, a rural clinic in the Midwest, is striving to improve T2DM QI metrics to impact diabetic care delivery. The clinic has this goal for several reasons. First, the current T2DM QI metrics of the clinic are below the national average (Symphony Performance Health [SPH], 2016). In March, 2016 a report from SPH, a QI dashboard software, revealed that the following T2DM QI metrics were below expected benchmarks: (1) 0% of patients with T2DM had documented foot exams; (2) 20% of patients had a dilated retinal exam; (3) 41% of patients had a documented A1C; (4) 56% of patients had a recorded blood pressure of less than 140/90; (5) 59% of patients had an LDL exam on record, and (6) 76% of diabetic patients had a recorded body mass index.

Providers in the clinic were often completing the T2DM care to standards. However, the SPH QI dashboard software was unable to query this data since documentation was not located in the correct fields in the electronic health record (EHR). Data was incorrectly entered due to the use of dictating devices by providers, staff failing to use the required template for documentation, and staff knowledge deficits regarding proper documentation for diabetic management. The clinic administrative staff was focused on QI for diabetic patients, because of the national trend for reimbursement of medical services, which is moving from a fee-for-service reimbursement system to a value-based reimbursement system (National Committee for Quality Assurance

[NCQA], 2014). Quality indicators will serve as a measure to assess the performance and quality of care to determine reimbursement rates.

In order to maximize reimbursement, healthcare organizations strive to meet the criteria of the Meaningful Use incentive program. This incentive program was initiated by the Centers for Medicaid and Medicare Services (CMS) and the legislation of the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 (Center for Disease Control and Prevention, 2016; Blumenthal & Tavenner, 2010). The HITECH Act provided financial incentives for the improvement of patient-care documentation for Medicare and Medicaid beneficiaries as part of the meaningful use of EHRs (Center for Disease Control and Prevention, 2016; Blumenthal & Tavenner, 2010). The clinical quality metrics in this incentive program include 44 measures that were created by the National Quality Forum, which established national goals and priorities to improve healthcare outcomes (National Quality Forum, 2016). Meaningful Use and QI strategies are important elements within healthcare delivery systems to establish and maintain a patient-centered medical home designation. Without a patient-centered medical home designation, value-based reimbursement payers, such as Blue Cross Blue Shield, may potentially deny claims from this rural office and filter patients to other clinic sites, which could lead to financial strain for the clinic.

This clinic is part of a larger ambulatory network that includes the physician hospital organization (PHO) and the affiliated ambulatory medical group, which currently monitor the QI metrics of the clinic. This clinic had its Blue Cross Blue Shield designation as a patient-centered medical home revoked in July, 2016 due to low quality-indicator metrics and the lack of an on-site medical doctor, leading to reduced reimbursement for care.

Improving patient outcomes and maintaining financial stability are important motivators in optimizing the diabetes management of an organization. The healthcare providers in this clinic struggled to improve quality metrics. This is true in many rural settings due to limited resources, poor patient compliance, limited leadership, staffing constraints, inadequate information technology, and complex decision-making requirements (Calico, Dillard, Moscovice, & Wakefield, 2003). However, rural clinics can benefit from partnerships with academic facilities, community stakeholders, and corporate healthcare leadership experts to improve patient outcomes, quality performance metrics, and reimbursement.

Problem Statement

This Midwestern rural clinic did not meet the benchmarks for diabetic quality indicator metrics for several reasons, including: (1) workflow issues, (2) EHR documentation that could not be reported by the SPH QI dashboard software, and (3) limited staff knowledge regarding the importance and purpose of diabetic quality metrics. The following clinical question addressed these identified issues: Can the comprehensive diabetic bundle of quality metrics for type 2 diabetes mellitus (T2DM) patients in a rural Midwestern clinic be improved through (1) the creation of a QI protocol, (2) increased provider and staff education regarding quality metrics, and (3) the optimal use of QI dashboard software? A comprehensive literature review provided support for this evidence-based initiative and demonstrated the importance of diabetes quality metrics and interventions.

Evidence-Based Initiative

Diabetes-Specific Endorsed Quality Improvement Metrics

Researchers demonstrated that incentive-based QI metric programs are highly effective in the improvement of diabetes management (O'Connor et al., 2011; NCQA, 2016a; Ali et al., 2016).

The Centers for Medicare and Medicaid Services, the National Committee for Quality Assurance (NCQA), and the American Diabetes Association (ADA) developed guidelines for T2DM QI metrics in 1995. The CMS and the NCQA selected and endorsed eight diabetes-specific process and outcome measures to monitor and assess the quality of diabetes management (O'Connor et al., 2011; NCQA, 2016a ; ADA, 2016). Many commercial insurance programs, such as the Centers for Medicare and Medicaid Services and the Veterans Health Administration (VHA), use these eight measures as a foundation for value-based reimbursement (O'Connor et al., 2011; NCQA, 2016a). These measures are important for assisting providers in delivering evidence-based care to improve patient self-management and diabetes control, leading to reduced complications. Many of the National Quality Forum measures are based on rigorous research and the guidelines created by the ADA and the American Association of Clinical Endocrinologists (ADA, 2016; Garber et al., 2016; NCQA, 2016b). The eight diabetes-related quality measurements are: (1) annual diabetic retinal exam, (2) annual diabetic foot exam, (3) blood pressure reading less than 140/90, (4) use of a statin medication to lower cholesterol, (5) use of an angiotensin converting enzyme (ACE) inhibitor or angiotensin II receptor blocker (ARB) to protect the renal system, (6) evidence of an annual nephropathy screening test, (7) annual hemoglobin A1C that is less than 8%, and (8) an annual body mass index measurement (O'Connor et al., 2011; ADA, 2016; Garber et al., 2016; NCQA, 2016b). Numerous studies have demonstrated that quality-performance measurement, clinician feedback, QI programming, and financial reimbursements have been associated with sustained improvements in diabetes care (Litvin & Ornstein, 2014; O'Connor et al., 2011; Ali et al., 2016).

Benefits of Multicomponent Quality Improvement Initiatives

The benefits of effective multicomponent QI initiatives are numerous. The utilization of QI strategies and QI metric feedback has been shown to motivate healthcare providers to improve patient care (Litvin & Ornstein, 2014). When clinics incorporate quality metrics into a feedback system, this feedback helps to promote change in care delivery and improve clinical practice (Campbell, Braspenning, Hutchinson, & Marshall, 2002). In this document, multicomponent interventions refer to the utilization of multiple efforts to improve QI metrics. For example: many QI strategies only educate providers, in contrast to this multicomponent QI initiative project, which involved educating the entire clinic staff, providing feedback mechanisms, and providing a resource in the form of a protocol. One observational study utilized clinical dashboards to measure diabetes-related care components in an EHR to create a feedback system for physicians. The purpose was to increase physicians' efficiency when locating diabetes-related documentation in the EHR (Koopman et al., 2011). According to Koopman et al. (2011), physicians located diabetes-related data at a faster rate ($p < 0.001$) using the clinical dashboards as a feedback tool, and this assisted with improving the delivery and documentation of diabetes care.

Quality improvement metrics have been validated by several studies as an effective means to assess primary healthcare. The results of a landmark randomized clinical trial by Ali et al. (2016) showed that multicomponent T2DM clinical quality metric programs demonstrated improved diabetes care. A controlled trial of 1,146 patients in India and Pakistan demonstrated that multicomponent T2DM clinical quality metric-based interventions effectively addressed patient-care barriers and improved patient outcomes (Ali et al., 2016). One of the primary barriers this study addressed was the management of patients located in low-resource clinics.

Over 28 months, the intervention group had greater A1C reductions, lower cholesterol levels, higher quality of life scores, and greater blood pressure reductions than the study's control group (Ali et al., 2016). The intervention participants, in comparison to the control participants, had A1C reductions of 0.50% (Confidence Limit -0.69% to -0.32%), systolic blood pressure reductions of -4.04 mmHg (Confidence Limit -5.85 to -2.22 mmHg), diastolic blood pressure reductions of -2.03 mmHg (Confidence Limit -3.00 to -1.05 mmHg), and low-density lipid levels that were decreased by a median of -7.86 mg/dl (Confidence Limit -10.90 to -4.81) (Ali et al., 2016).

Improved Patient Outcomes Due to Quality Improvement Strategies

The researchers of several studies have shown the effectiveness of improved T2DM patient outcomes and multicomponent QI strategies. In the early 1990s, the U.S. Department of Veterans Affairs (VA) aggressively measured T2DM performance to change treatment protocols in accordance to clinical quality metrics (O'Connor et al., 2011; Kerr & Fleming, 2007). The VA's T2DM clinical quality measurement program yielded outcomes significantly superior ($P < 0.001$) to T2DM patients being treated in the private sector (Kerr & Fleming, 2007). A cross-sectional, observational study compared the diabetic quality indicators at two clinics: (1) a diabetes clinic that serves a population of approximately 10,000 and (2) a general primary care clinic in a suburban region serving approximately 1,500 people (Mochtar & Al-Monjed, 2015). The goal of this study was to determine if the dedicated diabetes center provided superior outcomes compared to the primary care office. The dedicated diabetes office provided health and dietary consultations, foot and eye examinations, routine diabetic and lipid laboratory examinations, and blood pressure assessments. The primary care site trained its staff to provide the same care by utilizing quality indicators. Over a one-year period, the quality metrics of

T2DM management improved, and the use of clinical quality metrics allowed the primary care clinic to provide T2DM care with comparable outcomes to the specialty diabetic clinic (Mochtar & Al-Monjed, 2015). The primary care facility had greater reductions in LDL levels (-4.0%) compared to the diabetes centers (-3.8%; $p = 0.006$). The primary care clinic demonstrated greater reductions in fasting blood glucoses (0.4% versus 0.04%, $p = 0.151$) and slower progressions of micro albumin/creatinine ratios (93.1% versus 134.6%, $p = 0.492$; Mochtar & Al-Monjed, 2015). According to Mochtar and Al-Monjed (2015), the use of diabetes quality indicators can lead to diabetic patient care outcomes in a primary care office that are comparable to a specific diabetes specialty office with more resources.

The utilization of T2DM QI metrics by clinic staff demonstrated a reduction in patient care variations and helped ensure a complete assessment of diabetic-related health concerns (Grant, Haq, & Barnes, 2012). For instance, Grant, Haq, and Barnes (2012) completed a single, retrospective, and randomized clinical trial to assess the quality of T2DM management in the United Kingdom. The researchers of this study reviewed the charts of 200 randomly selected patients at a diabetic clinic to assess 15 quality measures of diabetes management (Grant et al., 2012). In this study, the following quality indicator metrics were less than optimal: (1) 45% did not have a documented smoking status, (2) 20% of patients had no structured educational intervention documented, (3) no patient was found to have a documented waist measurement, and (4) 70% of patients had incomplete psychological assessments (Grant et al., 2012). After implementation of the quality metric checklist, over 90% of the charts reviewed demonstrated increased adherence and documentation in the areas of blood pressure, hemoglobin AIC, body mass index, eye exams, and lipid screenings (Grant et al., 2012).

Quality Improvement and Healthcare Expenditures

The use of clinical quality metrics in T2DM management can potentially lower healthcare costs (Gilmer et al., 2005). One randomized clinical trial analyzed the healthcare costs of 600,000 patients with chronic conditions (Gilmer et al., 2005). The researchers concluded that adults with diabetes experienced higher healthcare-related costs than adults of the same sex and age without diabetes ($p = 0.015$). According to Gilmer et al. (2005), healthcare costs increased by 30% as a patient's A1C rose from 6% to 10%. Many of these increased costs were related to comorbidities. A multivariate analysis was conducted to review the healthcare costs of patients with a diagnosis of cardiac disease, hypertension, and diabetes over a three-year period. The data analysis revealed that those with T2DM and cardiac disease or hypertension had medical costs that were 300% higher ($46,879 versus $14,233; $p < 0.05$) than those with a diagnosis of diabetes without documented comorbidities (Gilmer et al., 2005). The researchers concluded that quality metric utilization was needed to optimally control glucose and to manage diabetes-related comorbidities. Furthermore, researchers determined that quality metric utilization was necessary to lower healthcare costs in relation to optimal diabetes management (Gilmer et al., 2005).

Effective QI programs can assist primary care clinics to lower healthcare costs, reduce variations in patient care, motivate healthcare providers to improve patient care, and improve patient care outcomes (Ali et al., 2016; Gilmer et al., 2005). For T2DM QI metrics to improve, QI metrics must be accurately documented and easily queried using QI dashboard software. Educating providers on processes that can improve EHR documentation resulted in improved QI metrics (Mazze, Powers, Wetzler, & Ofstead, 2008). One study reviewed charting before and after a provider educational documentation intervention. Over a one-year period, 1,188 patient

charts were reviewed at a teaching hospital before and after 29 physicians attended an educational documentation session (Momin, Lorenz, & Lamarre, 2016). The researchers demonstrated that the post-documentation intervention scores improved in quality and accuracy (Momin et al., 2016). Following provider education, documentation of complications or comorbidity increased by 27.1% ($p < 0.01$) and the documentation of mortality scores increased by 32.1% ($p < 0.01$).

Effective Type 2 Diabetes Mellitus Quality Improvement Interventions

The following interventions have demonstrated effectiveness in improving quality metrics: (1) use of clinical dashboards or similar software for QI feedback, (2) educational interventions regarding QI metrics and EHR documentation, and (3) the implementation of multicomponent QI interventions (Koopman et al., 2011; Ali et al., 2016; Mazze, Powers, Wetzler, & Ofstead, 2008; Momin et al., 2016; Mochtar & Al-Monjed, 2015). In conjunction with the selected conceptual models, evidence-based interventions were used in the implementation and evaluation of a sustainable, evidence-based QI initiative.

To address the clinical questions, the interventions designed to answer this clinical question were: (1) the utilization of the SPH QI dashboard software to obtain a T2DM QI metrics baseline, (2) development of a diabetic QI protocol regarding electronic health record (EHR) documentation on diabetes management and optimal SPH QI dashboard software utilization, (3) the implementation and evaluation of an educational session intervention on T2DM QI metrics, and (4) utilization of SPH QI dashboard software to obtain the overall changes in T2DM QI metrics.

Conceptual Models

Two conceptual models were used to guide this DNP project. The Donabedian model was utilized to explore the phenomenon of interest, which was improving the quality of diabetes management. The Promoting Action on Research Implementation in Health Service (PARiHS) model was used to guide the DNP project implementation.

The Donabedian Model

The Donabedian Model guided exploration of the phenomenon of interest, which was improving the quality of diabetes management. To improve the quality of diabetes management, the components of structure, process, and outcome are utilized (SPO; Donabedian, 1988). The theoretical element of structure refers to the environment or setting in which patient care is provided. Structure includes considerations such as facilities, finances, equipment, human resources, and the organization of the healthcare system (Donabedian, 1988). The process component refers to the delivery of healthcare services, such as healthcare provider actions, patient engagement, patient assessment, diagnosis, and education. Outcome refers to the end-product or result after implementation of a healthcare process or after patient care has been delivered. For example, T2DM QI metric changes were an outcome component for this DNP project. All three components of structure, process, and outcomes must be simultaneously considered in the Donabedian model (Donabedian, 1988). The focus of the DNP project was to concentrate on the development of the structure and process elements using the Donabedian model to guide each of the four interventions. To ultimately answer the clinical question, quality metrics were compared to assess the outcome of improving diabetes care at the clinic. A visualization of the Donabedian model is illustrated in Appendix A.

In this DNP project, the Donabedian model guided the exploration of the phenomenon of interest, improving the quality of diabetes management. Exploration of this phenomenon guided the design of the interventions necessary to improve T2DM QI metric outcomes. The structural components of the DNP project included the physical space of the building and resources to provide care, the hired personnel and staff of the facility, and the technology and specific EHR system of the clinic, Allscripts. Process interventions were considered when designing the educational intervention sessions and the workflow issues with protocol development. Interventions to address the optimal utilization of QI dashboard software were considered with baseline and ongoing QI metric assessment. Education regarding the optimal utilization of SPH QI dashboard software was included in the protocol to provide the clinic with a future instructional resource for accessing QI metrics. The SPH QI dashboard software was compatible with the EHR for locating and reporting diabetic QI reports. The Donabedian model provided an effective framework for examining the phenomenon of interest, improving the quality of diabetes management. The PARiHS model was then used to guide the DNP project implementation**.**

The PARiHS Framework

The PARiHS framework, created in 1988 by Kitson, Harvey, and McCormack, guided the DNP project implementation which included each of the four distinct interventions: (1) utilization of SPH QI dashboard software to gather baseline T2DM QI data, (2) development of a diabetic QI protocol regarding electronic health record (EHR) documentation on diabetes management and optimal SPH QI dashboard utilization, (3) implementation and evaluation of an educational session intervention, and (4) utilization of SPH QI dashboard software to obtain and analyze T2DM QI data in order to assess the quality metric improvement progress of the clinic. According to the PARIHS framework, to be successful, the change applied should be a function

of the relationship between the nature of evidence, the context in which the change is being executed, and the mechanism by which the change is facilitated (Kitson et al., 1998; Rycroft-Malone, 2004). Each element of the relationship can be rated on a scale of low to high. The framework suggests that the three primary concepts of evidence, context, and facilitation must be considered on a basis that is simultaneous, not linear. Therefore, when implementing evidence, careful attention must be paid to the three aspects of the intervention (See Appendix B). A description of how these elements were utilized in the implementation of this DNP project is provided in the Design for an Evidence-Based Initiative section.

The PARiHS model provided a framework for the implementation and evaluation of the diabetic QI initiative. According to the framework, evidence is derived from research, practitioner expertise and experience, the community/intended population, and the local context and environment (Kitson et al., 1998). Successful implementation requires evidence that is credible and diverse; however, the evidence should match patient and healthcare provider preferences (Rycroft-Malone, 2004). The context is the setting or location of the change, and a high context is an environment that is receptive to change and has strong leadership and adequate feedback systems and monitoring (Rycroft-Malone, 2004). Leaders are critical for assisting with the cultural transformation during an organizational change process (Rycroft-Malone, 2004). Facilitation is defined as the type of support needed to change the habits, attitudes, workflow, and/or skills within the setting (Kitson et al., 1998). If all three elements can be rated highly on the continuum, then implementation will most likely be successful (Kitson et al., 1998).

Need and Feasibility Assessment of the Organization

The need and feasibility assessment of the DNP project in the organization is discussed in the following sections. Organizational assessment components, such as reimbursement, organizational mission, workflow changes, feedback, and leadership will be explored.

Reimbursement

The DNP project site, employed two physician assistant providers (PA-Cs) and a remote-access physician, that served a large Medicare and Medicaid population. The affiliated network of this rural office consisted of more than 100 providers. According to the Center for Medicare and Medicaid Services, as of 2015, a value modifier (VM) will be applied to physician payments under the Medicare fee schedule for physicians who are in groups of 100 or more (Ritchie, Marbury, Verdon, Mazzolini, & Boyles, 2014). The VM determines reimbursement for providers based on the quality of care provided in comparison to cost during a performance period; therefore, the VM will rely heavily on the CMS physician quality reporting system's scores for QI information (Ritchie et al., 2014). The upcoming reimbursement and Medicare fee schedule changes occurring between 2016 and 2018 will affect this office. In 2016, CMS began applying the VM to physician payments under the physician fee schedule for physicians in groups of 10 or more, with performance based on 2014 scores. In 2017, the VM will be applied to all eligible providers (Ritchie et al., 2014). These upcoming changes were a motivating factor for the clinic providers and the affiliated organizational medical leadership to improve comprehensive T2DM QI metrics. The reimbursement rates for diabetes care management vary depending on the type of insurance coverage. The overall goal of both the affiliated administration and the rural clinic staff was to improve the efficiency and quality of patient care delivery to achieve maximum reimbursement.

Another factor affecting reimbursement is the ability to document and accurately report delivery of diabetes care in the EHR. The current low T2DM QI metric scores resulted from many possible causes, including the inability of SPH, the QI dashboard software, to query all provided care. If the care provided was not documented in the required templates in the EHR, the SPH QI dashboard software was unable to query the information. If information could not be located and reported by the SPH QI dashboard software, this negatively affected the overall diabetic care QI metrics and reduced the reimbursement to the clinic.

Organizational Mission

The mission statement of the affiliated organization is to "be the best value in health care as defined by quality outcomes and cost" (MHC, 2016, para. 1). The rural practice site is one of numerous affiliated ambulatory offices in a large health system that is considered to be a "fully integrated health network, committed to quality, evidenced-based patient care and cost efficiency" (MHC, 2016, para. 1). The affiliated organization's mission to provide the best patient outcomes possible aligns with the DNP project goals of improving the T2DM QI metrics. Quality improvement strategies and multicomponent QI metric programs are an effective means to provide consistent patient care (Ali et al., 2016; Grant et al., 2012).

Workflow Changes and Feedback

Changes in the provider workloads or ancillary staff workflow were needed to improve the comprehensive T2DM QI metrics in a sustainable and feasible manner. Thus, efforts to enhance team-based care were considered in the DNP project interventions. For example, if medical assistants focused more on a team-based approach with the PA-Cs, simple tasks, such as instructing patients to remove shoes and opening the appropriate templates for the providers at the start of the patient visit, would allow the providers to more efficiently complete the required

QI metric tasks during a routine visit. Another identified need was the providers' lack of feedback regarding QI metrics. Primary care settings that measure and utilize feedback systems, such as clinical dashboards, experience improved QI metrics (Campbell et al., 2002; Koopman et al., 2011). Currently, the affiliated ambulatory network sends monthly QI metric data via secure email exclusively to physician providers. The rural clinic was comprised of two PA-Cs; thus, the monthly feedback was not available to providers. Therefore, the DNP project focused on interventions to: (1) obtain baseline T2DM QI data, (2) develop a protocol to educate and provide a resource for providers regarding optimal EHR documentation and the utilization of SPH QI dashboard software, (3) educate the clinic staff on T2DM QI metrics and documentation, and (4) obtain another SPH QI dashboard software report to measure T2DM QI progress.

Leadership

This rural clinic consisted of a small staff of eight employees. The two primary on-site providers were PA-Cs, who supported the DNP project. The QI metric data created from the diabetic patient population at the clinic is monitored by members of a larger health network, the administration of the physician hospital organization (PHO), and an affiliated corporate ambulatory medical group. Members of the PHO interact with and oversee the QI data of multiple clinic sites. The organizational mentor of the DNP project was the director of operations for the regional corporate ambulatory medical group. The organizational mentor oversees the primary care offices and reports to the PHO. The mentor's job responsibilities included: (1) implementing a strategic plan and mission, (2) overseeing the financial performance of the ambulatory region's primary care sites, and (3) ensuring the quality of services through evidenced-based practice and outcome management. The team member was an appropriate mentor for the DNP project, due to her experience in this role and her Master of

Science in Administration (MSA) preparation. The organizational mentor for the DNP project was directly involved in the implementation, monitoring, and success of the DNP project. In addition to the director of operations, members of the QI specialty from the PHO and information technology team were pivotal to the success of this DNP project.

Feasibility

The interventions to improve the T2DM QI metrics of the clinic focused on bettering patient care. The successful development and implementation of the diabetic QI initiative could potentially improve the financial stability of the clinic in the future by assisting the clinic to again obtain a Blue Cross Blue Shield patient-centered medical home designation and increase reimbursement under the VM schedule fee changes by improving the QI metrics. It is important to note that this patient-centered medical home designation also requires an onsite medical physician. This site will need to hire an onsite medical doctor and improve QI metrics in order to reapply for a patient-centered medical home designation. After considering both the positive and negative factors surrounding the DNP project implementation, there was sufficient evidence to suggest that modifications regarding diabetic QI measurement and documentation should be addressed at this rural clinic. To fully understand the needs and feasibility of this DNP project at this rural clinic, an analysis of the strengths, weaknesses, opportunities, and threats (SWOT analysis) was completed, and the results are presented in Appendix C.

Project Plan

The following section reviews the DNP project plan and provides detailed information on the purpose, objectives, type, setting, design, data sources, measurement forms, timeline, budget, and ethical considerations of the project.

Purpose of Project with Objectives

The purpose of the DNP project was to answer the following clinical question: Can the comprehensive diabetic bundle of quality metrics for T2DM patients in a rural Midwestern clinic be improved through (1) the creation of a QI protocol, (2) increased provider and staff education regarding quality metrics, and (3) the optimal use of QI dashboard software? The interventions designed to answer this clinical question were (1) the utilization of the SPH QI dashboard software to obtain a baseline of T2DM QI metrics, (2) the development of a diabetic QI protocol regarding electronic health record (EHR) documentation on diabetes management and optimal SPH QI dashboard software utilization, (3) the implementation and evaluation of an educational session intervention on T2DM QI metrics, and (4) the utilization of the SPH QI dashboard software to obtain the overall changes in T2DM QI metrics. This DNP project had the following evidence-based objectives:

1. **Optimal use of Quality Improvement dashboard software.**
    - Establish a T2DM QI metrics baseline at the DNP project site in March, 2016 and prior to the formal interventions implemented during April, 2017 (Time 1).
    - Introduce the staff to the QI dashboard software (SPH) and create a protocol for software utilization regarding diabetic QI and EHR documentation to provide a measurement and feedback system by April 10th, 2017.
2. **Increase provider and staff knowledge regarding quality metrics.**
    - Address the knowledge deficits of the providers and the staff of the clinic on diabetic QI metrics by designing and implementing an educational session intervention delivered on April 10th, 2017.

- Measure outcomes of the T2DM QI educational session intervention by utilizing a pre- and post-survey to examine clinic staff confidence on April 10th, 2017.

3. **Creation of a diabetic QI protocol.**
    - Improve the components of context and facilitation, as outlined in the PARiHS framework, by creating a comprehensive diabetic QI program protocol approved by the DNP project team and organizational mentor by April 5th, 2017.
    - Assess the workflow and patient care documentation of the clinic staff to inform the diabetic QI protocol. After protocol approval, educate the clinic staff on workflow changes, protocol contents, and educational diabetic QI content on April 10th, 2017.
4. **Measurement of diabetic quality indicator metrics.**
    - Measure the outcomes of the diabetic QI initiative by assessing changes in the diabetic quality metrics one month after intervention implementation on May 10th, 2017 (Time 2).

Type of Project

This DNP project was a Quality Improvement (QI) initiative. The components of this QI initiative included reviews of the current quality metrics of the clinic, and assessments of the current workflow processes and patient care documentation that led to low T2DM QI metrics scores. The QI initiative then facilitated organizational changes to improve these QI metrics. The interventions designed to answer this clinical question were: (1) the utilization of the SPH QI dashboard software to obtain a T2DM QI metrics baseline, (2) development of a diabetic QI protocol regarding electronic health record (EHR) documentation on diabetes management and optimal SPH QI dashboard software utilization, (3) the implementation and evaluation of an

educational session intervention on T2DM QI metrics, and (4) the utilization of SPH QI dashboard software to obtain the overall changes in T2DM QI metrics. This QI initiative was designed to be reflective of the continuous quality improvement process. Therefore, additional diabetic QI metrics were gathered prior to implementation during April, 2017 to address the changes that resulted from the informal staff education that occurred while assessing the organization's current state.

Setting

The site for this DNP project was a primary care clinic in a rural Midwest area that served pediatric and adult patients. The site was affiliated with a larger healthcare network, which was committed to providing high-quality, evidenced-based, and cost-efficient patient care. A physician hospital organization (PHO) and an affiliated corporate ambulatory medical group managed the site. This corporate ambulatory network was composed of over 80 primary and specialty centers located throughout the Midwestern state.

The site employed a medical doctor (M.D.) who was available during business hours (7:00 a.m. to 5:00 p.m.) for collaboration via the telephone or the Internet and an on-site staff that included two full-time Physician Assistants (PA-Cs), an office manager, an operational manager, a secretary, and several medical assistants. An organizational chart of the project site is provided in Appendix D. One PA-C served only adult patients and was categorized as an internal medicine provider. The other PA-C served all patients and was considered a family practice provider.

Needed Resources

The resources needed to complete the DNP project included the support of the on-site PA-Cs, the operational manager, the office manager, and the ancillary staff to develop the QI protocol

and educational materials. Another resource was the clinic staff's time for the educational session intervention phase of the DNP project. Additional resources included the time and support of the DNP project mentor. The technology needed for this QI initiative program included the EHR system (Allscripts) for data documentation and the Symphony Performance Health (SPH) QI dashboard software for data collection. The required resources and DNP project setting influenced and guided the design and implementation of the comprehensive diabetic QI protocol and educational session.

Design for the Evidence-Based QI Initiative

To improve the T2DM QI metrics at this site, the DNP student used the Donabedian model to explore the components of the phenomenon of interest, improving the quality of diabetes management. The PARiHS framework was utilized to guide the design of the implementation.

Donabedian. The Donabedian model and the components of structure, process, and outcome (SPO) were utilized to explore the components of the phenomenon of interest, which was improving the quality of diabetes management. The interventions associated with structure and process included the development of a diabetic QI protocol and an educational session intervention. These elements will ultimately impact the outcomes of diabetic quality metrics.

***Structure*.** According to Donabedian (1988), the structure component includes the setting in which patient care occurs and the instruments required to provide this care, such as the organizational structure, the adequacy of facilities and equipment (including the EHR and SPH), the fiscal organization, and the clinic staff's qualifications. The interventions focused on improving staff awareness and documentation of how and where to document diabetic quality metrics. The diabetic QI protocol and QI educational session intervention focused on addressing this component.

Process. According to Donabedian (1988), the process component includes the technical method of care, the culture and beliefs of the providers and staff, the activity and quality of EHR documentation, and the patient care workflow. The diabetic QI protocol and educational session intervention, designed during the implementation phases, addressed the components of process and structure. The educational session intervention was evaluated with staff surveys to determine changes in the level of confidence regarding T2DM QI metric awareness and documentation. The administration and analysis of these confidence surveys assisted in the demonstration of the process component by noting a change in perspective for the providers and staff.

Outcome. The element of outcome is the ultimate validation of the effectiveness and quality of patient care (Donabedian, 1988). The ultimate outcome of this DNP project is the improvement in T2DM QI metrics after implementing quality improvement initiatives targeting structure and process.

PARiHS. The PARiHS framework was used to guide the design and interventions of this comprehensive diabetic QI initiative. According to this framework, all three elements of context, facilitation, and evidence must be considered for any process or organizational change to be effective (Kitson et al., 1998).

Evidence. Evidence demonstrates that QI strategies and QI metric measurement provides incentives that are highly effective in the improvement of T2DM management (O'Connor et al., 2011). The clinic personnel knowledge was assessed to develop and improve QI documentation and patient care skills. The potential success of evidence-based QI initiatives to improve outcomes was communicated to the PA-Cs, ancillary staff, and operational managers to enhance

the comprehension of project goals. The importance of quality metric reporting and financial reimbursement was also presented to educate and to motivate the clinic personnel.

Context. The context of this DNP project consisted of elements such as cultural understanding, leadership roles, and an understanding of organizational function. These contextual elements were considered in designing the DNP project interventions. Cultural understanding involved an awareness of the population of the clinic. The intended population of the DNP project included the staff of the clinic; therefore, these clinic staff members were involved in the design and implementation of the diabetic QI protocol and educational session intervention. Reimbursement was another important aspect of the outcomes of this DNP project. The director of ambulatory care overseeing the DNP project and the strong motivation of the PA-Cs at the clinic allowed these personnel to serve as beneficial leaders throughout the protocol design and implementation phases. Leaders are highly important for assisting with the cultural transformation during an organizational change process (Rycroft-Malone, 2004). The culture of the clinic included an assessment of the current patient care processes in relation to the T2DM QI metrics, and the facilitator performed the assessment through direct observation of efficiency. In this case, the DNP student functioned as the facilitator. The current processes of the QI documentation and the staff's understanding of QI metrics were evaluated and considered when designing the diabetic QI protocol. The T2DM QI metric data prior to implementation and the current understanding and attitudes of diabetic quality metrics were included in the cultural assessment. The pre- and post-educational confidence surveys assessed the confidence levels of the staff (Appendix E). The diabetic QI protocol also included workflow recommendations for the ancillary staff to implement during the patient intake process. This protocol outlined the required EHR documentation locations for the T2DM QI metrics to be queried. The educational

resources and protocol materials were designed to support compliance in documenting the recommended comprehensive T2DM QI metrics.

Facilitation. Facilitation is defined as the types of support needed to help change the habits, attitudes, workflow, and skills of a setting (Kitson et al., 1998). Education of the PA-Cs and the clinic staff regarding T2DM QI metrics was a necessary component of the facilitation phase. The educational session introduced the importance of T2DM QI metrics, EHR documentation, and SPH QI dashboard software utilization. The role of the facilitator (the DNP student) was to assist in the development of a clinical culture that was receptive to an organizational change process that would result in the desired outcome of improved comprehensive T2DM QI metrics. The DNP student was present in the clinic for a period of 14 months, from March, 2016 until May, 2017 (Time 3). During this time, the DNP student assisted the clinic personnel by assessing the practice, providing an educational session intervention, and providing support and clarity related to the DNP project subject matter. The facilitator collected and disseminated the comparison of T2DM QI metrics. The staff confidence levels related to the T2DM QI metrics and developed protocols were evaluated with pre- and post-educational confidence surveys.

Participants

The number of participants included all clinic staff, totaling eight participants (N = 8). The staff of the clinic included the PA-Cs, office managers, and ancillary staff receiving the educational session intervention (see Appendix D for a visualization of clinic staff, Appendix F for educational session intervention materials).

Measurement: Sources of Data and Tools

The sources of data, measures, and tools will be described for each intervention. The QI data over time will be used to assess the ultimate outcome of improved T2DM QI metrics.

Optimal use of Quality Improvement dashboard software and initial measurement of Diabetic Quality Indicator metrics. The DNP project required the utilization of the T2DM QI metric reports generated from SPH QI dashboard software, which located and reported patient care data from the EHR, Allscripts. The affiliated corporate quality metric medical group gathered and provided an initial set of comprehensive T2DM QI metrics for March, 2016 (see Appendix G, Table G1).

Provider and staff education regarding quality metrics and the creation of a diabetic Quality Improvement protocol. Another facet of the DNP project was to educate the staff of the clinic on QI strategies. A diabetic QI protocol was created, and an educational session intervention for staff was delivered regarding the T2DM QI protocol, the definition and importance of QI metrics, the recommended work process changes, and the proper utilization of the SPH QI dashboard software. Pre- and post-educational confidence surveys were used to assess the educational session intervention and protocol utilization (see Appendix E for survey, Appendix F for educational session intervention material). Changes in pre- and post-survey scores served as an evaluation method for the clinic staff regarding the educational session intervention (see Appendix H for a bar graph of the survey result changes). The protocol and educational session intervention assisted the clinic in developing a stronger foundation for the cultural change of incorporating continuous QI strategies.

Project Evaluation Plan

Successful evaluation of the DNP project included completing the following deliverables: (1) obtaining a baseline T2DM QI dataset in March, 2016; (2) developing a diabetic quality indicator protocol; (3) developing, implementing, and evaluating T2DM QI educational materials with pre- and post-educational confidence intervention surveys; and (4) gathering of a post-

implementation T2DM QI dataset from SPH QI dashboard software for subsequent analysis. Ultimate success of the DNP project was to be determined by the impact on T2DM QI metrics. After the baseline T2DM QI data (March, 2016), another set of comprehensive diabetic quality indicator metrics was gathered in April, 2017, prior to implementation, and in May, 2017, one month after DNP project implementation. The evaluation consisted of comparing the percentage changes from each dataset and utilizing two independent sample t-tests ($p = 0.05$) to determine a significant change in metric scores for the interval. One month of data may not reflect the total impact of the intervention on the T2DM QI metrics, due to the continual process of QI strategies. Therefore, the staff was instructed on continued monitoring of T2DM QI metrics on a monthly basis to inform the continuous QI process.

Steps for Implementation of the DNP Project and Timeline

Implementation of the DNP project included the following actions, as shown in the chronological timeline provided in Appendix I:

- Presented the DNP project proposal to the DNP project team in written and oral forms on February 10th, 2017.
- Submitted Grand Valley State University Institutional Review Board application on March 3th, 2017.
- Obtained Grand Valley State University Institutional Review Board determination as "Non-Research" on March 3th, 2017 (see Appendix J).
- Completed the development of a formal diabetic QI protocol and educational materials (see Appendix F) on April 4th, 2017.
- Presented diabetic QI protocol and an educational session intervention to DNP project advisor and site leadership in written form on April 5th, 2017.

- Integrated feedback from organizational leadership regarding the diabetic QI protocols and educational materials on April 7th, 2017.
- Implemented the diabetic QI protocol program components in the organization by printing and distributing the diabetic QI protocol and by completing an educational session intervention with staff at the DNP project site on April 10th, 2017.
- Initiated pre- and post-educational confidence intervention surveys on April 10th, 2017.
- Obtained an additional SPH T2DM QI metric dataset report on May 10th, 2017, and compared the post-implementation T2DM QI metrics to the pre-implementation T2DM QI metrics from March, 2016 and April, 2017 (Time 1, Time 2, and Time 3) with percentage changes.
- Discussed the pre- and post-educational confidence intervention survey results, protocol recommendations, and comparisons of T2DM QI metrics with the clinic staff on May 12th, 2017.
- Disseminated the findings post-implementation via an oral defense presentation on July 24th, 2017.
- Submitted final DNP project to ScholarWorks and the university's Graduate Studies Office on August 28th, 2017.

Ethics and Human Subjects Protection

Due to the human interactions involved in the educational session intervention and the potential for contact with patients' protected health information, the DNP student applied for and obtained a GVSU IRB determination of "Not-Research" on March 3rd, 2017 (see Appendix J for determination letter). All survey participants of the educational intervention were kept

anonymous. Following the requirements of the university, any transfer of protected health informational data was completed by utilizing an encrypted flash drive, which was provided by the DNP student. This encrypted flash drive was secured in a locked container at the DNP student's private residence when it was not in use. This flash drive was given to the university for a secure and locked site upon completion of the DNP project. Per university policy, the university will keep this encrypted flash drive in a secure and locked location for a period of seven years, after which the flash drive will be destroyed by the university.

Budget

The budget to complete the DNP project primarily involved the cost of one hour of staff time to complete the educational session intervention. After considering the average wages of certified medical assistants, secretaries, office managers, and PA-Cs, the projected cost of the educational session intervention was approximately $1,057.81 (Pay Scale, 2016a; Pay Scale, 2016b; Pay Scale, 2016c; Pay Scale, 2016d). The consultation of the organizational mentor (the director of ambulatory services) was also considered to be an expense required for the completion of this DNP project. The organizational mentor's time was required for several consultation meetings, site visits, meetings with the DNP student and the DNP student's academic advisor, two DNP project defenses, and for the review of the various DNP project documents (Pay Scale, 2016e). See Appendix K for a listing of the average hourly wages for different healthcare professionals and the estimated overall budget of this diabetic QI initiative. The cost of the DNP student's design, implementation, and facilitation of this diabetic QI initiative was considered as an in-kind donation or in-kind revenue to the clinic.

Project Outcomes

The outcomes were determined based on the data collected to answer the following clinical questions: Can the comprehensive diabetic bundle of quality metrics be improved through (1)

optimal use of QI dashboard software, (2) increased provider and staff education regarding quality metrics, and (3) the creation of a diabetic QI protocol?

Optimal Use of Quality Improvement Dashboard Software

The PA-Cs, office manager, and operational manager were educated on the importance of obtaining periodic T2DM QI metric feedback. A protocol to assist with ongoing metric data collection was developed and provided to the clinic staff on April 10th, 2017, to provide a resource for the optimal use of the SPH QI dashboard software. Outcome measure: the T2DM QI protocol provided detailed information and screen shots regarding how to obtain dashboard QI metric reports. The DNP student recommended the clinic staff access this QI dashboard software on a monthly basis to periodically assess the progress of T2DM QI metrics.

Increased Provider and Staff Education Regarding Quality Metrics

The knowledge deficit regarding the purpose and value of T2DM QI metrics and appropriate provider documentation of the measures was addressed through the creation, design, and implementation of an educational session intervention. This educational session intervention included a one-hour session explaining T2DM QI metrics, QI metric documentation in the EHR, and optimal use of the SPH QI dashboard software. The DNP student completed this educational session intervention and provided a brochure handout to the staff on April 10th, 2017 (see Appendix F). Outcome measure: The educational session was implemented, and the designed educational brochure was discussed and provided to all eight clinic personnel on April 10th, 2017. This educational session intervention was evaluated with pre- and post-educational confidence surveys (see Appendix E). All clinic personnel completed the pre- and post-educational confidence surveys (8 of 8). Appendix L shows the demographics of the office staff who completed the intervention; 25% were PA-Cs, 50% ancillary staff, and 25% management.

All members of the DNP project site were actively involved and engaged during the intervention process and were committed to improving the T2DM QI metrics. Overall, the confidence level scores of all staff members improved after the educational session intervention and protocol were implemented. Appendix M exhibits a table of the changes that occurred between the pre- and post-educational confidence level scores, illustrating that all staff rated increased confidence in every category after the educational session intervention.

Creation of a Diabetic Quality Improvement Protocol

As guided by the Donabedian model, the design and implementation of a diabetic QI protocol, which included screenshots from the EHR for instructional purposes, and an educational QI intervention session improved the structure and processes of the clinic staff's workflow. Outcome Measure: The DNP student worked in collaboration with organizational leadership to design and create a diabetic QI protocol, which included screenshots from the EHR for documentation instruction purposes. This diabetic QI protocol was then printed and provided to the clinic staff.

The diabetic QI protocol was developed by the DNP student and accepted by the affiliated network administration of the clinic. This protocol provided the clinic staff with a sustainable resource for documenting QI metrics. The diabetic QI protocol is not placed in this paper due to privacy law protections. Outcome measure: The diabetic quality indicator protocol, including EHR and SPH QI dashboard software screenshots, was designed and provided to the office on April 10th, 2017. This sustainable resource assists in fostering the development of the structure and process components of the Donabedian model. The protocol was also provided to the quality specialists at the PHO and to the affiliated ambulatory network administration as a sustainable resource for this clinic and perhaps other clinics in the organization.

Measurement of Diabetic Quality Indicator metrics. The final outcome of changes in T2DM QI metric data will be discussed based upon each data collection period.

March, 2016 to April, 2017 (Time 1). An initial T2DM QI metric baseline dataset was gathered in March, 2016 (see Appendix G, table G1). According to this baseline dataset, the specific diabetes-related quality measures that were below the National Committee for Quality Assurance (NCQA) expected benchmarks for T2DM management included: (1) 0% of patients with T2DM had documented foot exams; (2) 20% of patients had a dilated retinal exam; (3) 41% of patients had a documented A1C; (4) 56% of patients had a recorded blood pressure of less than 140/90; (5) 59% of patients had an LDL exam on record, and (6) 76% of diabetic patients had a recorded body mass index. Between March, 2016 and April, 2017 (Time 1), the DNP student facilitated many informal educational discussions regarding QI strategies, during which the T2DM QI metric data began to change. The March, 2016 T2DM QI metric data was measured and compared to the pre-implementation April, 2017 (Time 1) data, and the effectiveness of the diabetic QI initiative interventions were then subsequently statistically analyzed (see Appendix G, table G2). Outcome measure: Statistical analysis was completed by utilizing the percentage comparisons to complete a two-sample, independent t-test to determine the significant percentage changes between the data collection periods. These two-sample, independent t-tests were set to a 95% confidence interval and a p-value of 0.05. From March, 2016 to April, 2017 (Time 1), analysis of the following diabetic quality indicators led to statistically significant improvements in 2 of the 12 T2DM QI metric categories, diabetic foot exam documentation and the number of patients with a hemoglobin A1C less than 9% (see Appendix N).

April, 2017 to May, 2017 (Time 2). The formal implementation period was April 10th, 2017, to May 10th, 2017 (Time 2). The pre-implementation April, 2017 T2DM QI metric data was measured and compared to the post-implementation May, 2017 (Time 2) data, and the effectiveness of the diabetic quality indicator initiative interventions were then subsequently statistically analyzed (see Appendix G, table G2). Outcome measure: Statistical analysis was completed by using the percentage comparisons to complete a two-sample, independent t-test to determine the significant percentage changes between data collection periods. These two-sample, independent t-tests were set to a 95% confidence interval and a p-value of 0.05. From April, 2017 to May, 2017 (Time 2), 2 of the 12 T2DM QI metrics showed significant statistical improvement, the number of patients with a blood pressure less than 140/90 and the number of patients with a documented hemoglobin A1C (see Appendix N for a table of improved metrics). The gradual change in T2DM QI metrics may be reflective of the continuous process of QI strategies, particularly regarding structure and process components as outlined in the Donabedian model.

March, 2016 to May, 2017 (Time 3). Due to the continuous process of QI strategies, the effectiveness of both formal and informal DNP project interventions were analyzed by comparing the baseline March, 2016 T2DM QI metric data to the May, 2017 (Time 3) post-implementation T2DM QI metric data. Outcome measure: Statistical analysis was completed by utilizing the percentage comparisons to complete a two-sample, independent t-test to determine if the percentage changes between data collection periods were significant. These two-sample, independent t-tests were set to a 95% confidence interval and a p-value of 0.05. When comparing the March, 2016 T2DM QI metrics to the May, 2017 (Time 3) T2DM metrics to evaluate the effectiveness of continuous QI strategies, 5 of the 12 measured T2DM QI metrics

demonstrated a statistically significant change. Appendix N is a visualization of the significant T2DM QI metric changes. A visualization of the percentage changes (Appendix G, table G1) and the two-sample, independent t-test comparisons can also be viewed in Appendix G, table G2. The T2DM QI metric "Attention to Nephropathy" remained unchanged and was not applicable for the two-sample, independent t-test analysis.

After the implementation of this DNP project, the clinic is currently meeting 3 of the 12 National Committee for Quality Assurance (NCQA) QI measures for T2DM management. Prior to the implementation of this DNP project, the clinic met only one of the NCQA diabetic quality measures, Attention to Nephropathy if Albuminuria. The NCQA diabetic quality measures, HbA1C < 8% and LDL < 100 were met after implementation. Appendix O presents the T2DM metrics that are currently achieving the targeted NCQA QI measures for T2DM management.

Implications for Practice

This DNP project that addressed improving diabetic QI metrics had implications for the rural T2DM population of the DNP project site, the clinic staff of the affiliated ambulatory organization, and the nursing discipline. The DNP project site benefited from the ability to assess, measure, and evaluate the progress of T2DM QI metrics by healthcare personnel in order to improve diabetic patient care. When patient care is consistent and evidence-based, morbidity and mortality can be decreased, which positively impacts the health outcomes of the diabetic population served by clinic in this community. The T2DM QI initiative contributed to the discipline of nursing by demonstrating how a multicomponent diabetic QI initiative can improve T2DM QI metrics in a rural clinic that is resource challenged. This DNP project demonstrated that the following interventions are effective at improving T2DM QI metrics in rural, resource-challenged clinic sites: (1) obtaining baseline QI metrics, (2) developing and implementing a

site-specific diabetic QI protocol, (3) educating the clinic staff on QI and a QI dashboard software, and (4) continuously evaluating QI metrics for analysis and evaluation. The DNP project was guided by the Donabedian model for exploring the phenomenon of interest, improving the quality of diabetes management. The PARiHS framework was utilized for designing the DNP project implementation. Use of these models assisted in designing a T2DM QI initiative that resulted in a comprehensive approach to diabetes management. The discipline of nursing benefited from the dissemination of a DNP project that utilized a comprehensive approach of QI strategies from a doctoral level perspective to address multiple aspects of a complex clinical problem. This doctoral approach also utilized conceptual frameworks and evidence-based interventions to address low T2DM QI metrics in a rural, resource-challenged clinic. The implications, strengths, and successes of this DNP project were evaluated, as were the difficulties, limitations, sustainability, and weaknesses.

Strengths and Successes of the Project

Numerous successes and strengths were demonstrated through the completion of this DNP project. Each of the strengths and successes will be discussed in the order of the completed interventions. The first intervention obtained a baseline T2DM QI metric dataset from the SPH QI dashboard software. The utilization of this software has the potential to develop a culture of information sharing between site personnel regarding documentation performance. The utilization of SPH QI dashboard software identified areas of clinical weaknesses regarding quality indicators that are not at the national target for NCQA diabetic QI metrics for optimal patient care.

To address the continued improvement of T2DM QI metrics at the clinic, increased use of resources, time, education, and energy will be required. One of the outcomes of this DNP

project was the optimal utilization of SPH QI dashboard software for generating QI dashboard reports, which was addressed by the diabetic quality indicator protocol and educational session intervention. The second intervention resulted in a sustainable diabetic QI protocol, which helped the clinic to establish a standardized process for documenting T2DM QI metric categories in the EHR that can be queried and reported. The third intervention involved development and implementation of a staff educational session intervention and sustainable QI educational material. After attending the educational session, staff indicated increased confidence levels regarding the purpose of documenting T2DM QI metric indicators. The fourth and final intervention involved the use of SPH QI dashboard software to obtain another T2DM QI metric dataset to evaluate the percentage changes after subsequent statistical analysis. Overall, this DNP project led to statistically significant changes in 5 of the 12 measured diabetic quality indicators from March, 2016 to May, 2017 (Time 3; see Appendix G, Table G2 for all T2DM QI metrics or Appendix N for a table of improved T2DM QI metrics). As a result, 3 of the 12 T2DM QI metrics have met the NCQA target percentiles, and 11 of the 12 are closer to the desired NCQA diabetic QI metric target percentiles.

The development of the structure and process components of the Donabedian model was another strength of this DNP project, as was the collaboration and culture change experienced between the affiliated QI departments, the clinic personnel, and the administration of the affiliated ambulatory network. This collaboration and culture change may lead to continued focus on quality that can impact patient care. Although this DNP project had multiple strengths, several weaknesses and difficulties were associated with this DNP project.

Weaknesses and Difficulties of the Project

Numerous difficulties were encountered over the course of the DNP project. The first was the change in the affiliated clinic administration staff. Staffing changes created several delays in the completion of the organizational assessment. After an additional month, the DNP student was placed with a new site mentor and completed the assessment.

Several weaknesses were associated with the compliance of the rural population of the clinic to diabetic treatment recommendations. The patients of this clinic are resistant to attending additional office visits for chronic conditions and tend only to schedule acute-care visits. This makes it difficult for the clinic staff to meet T2DM QI metrics, such as ordering hemoglobin A1C laboratory values or completing a diabetic foot assessment. The diabetic QI educational session intervention assisted clinical staff to begin developing an awareness to search the EHR for the fulfillment of T2DM QI metrics for patients with chronic disease diagnoses to be addressed at every office visit, capitalizing on the opportunities to address diabetic quality metrics. The weaknesses and difficulties of this DNP project were associated with the limitations of the DNP project.

Limitations of the Project

The DNP project had several limitations, related to the SPH QI dashboard software. One limitation included the inability of SPH, to identify specifically when a patient encounter occurred. The software queries and records the T2DM QI metrics completion or absence, regardless of time, data, or status of patient, which led to a less accurate measure of the T2DM QI metric progress. The site was a family practice office; therefore, the SPH QI dashboard software had limited capability to quantify the number of diabetic patients that were treated by the PA-Cs during the 14-month DNP project period. The total diabetic population of the clinic

was included in the calculations rather than the total patients with T2DM treated by the specific providers in a specific time period. The SPH QI dashboard software runs collective and ongoing T2DM QI metrics by consistently querying the EHR by patient diagnosis, and the information technology specialists were unable to isolate when a provider saw a diabetic patient. Therefore, the outcomes of the QI metrics of this DNP project included QI metrics that were collective of the clinic and organized by diagnosis, and not specific timeframe and diagnosis.

The second limitation was also related to the SPH QI dashboard software, which did not drop patients with an inactive status, resulting in inaccurate total T2DM QI metric data as the denominator for percentage calculation. For example, if a patient had not been present in the office for several years, this patient was still queried by the SPH QI dashboard software, and included in the total diabetic population, resulting in an inaccurate potential population of diabetic patients included in the quality metric calculations. In order to acquire an accurate total of T2DM population data for the clinic, these inactive patients must formally discharged from the clinic with specific documentation noted in the EHR. The recommendation to attend to this issue was addressed in the protocol by having all patients that have not completed a patient encounter in the past calendar year be contacted by the clinic office staff to schedule an appointment or be assessed for patient status.

The third limitation related to the SPH QI dashboard software was that many patients of the rural clinic opted to have their laboratory venous samples drawn at a non-affiliated organization located 3 minutes from the clinic, which utilizes faxed reports to the clinic. Since the electronic records are not interoperable, the laboratory results are scanned into the clinic EHR in a field that is not located and reported by the SPH QI dashboard software. These scanned results negatively

affected the T2DM QI metrics that required laboratory data, as these results are unable to be included in the collective T2DM QI metric scores of the clinic.

Another DNP project limitation was the implementation timeline. The data collection was limited to one month due to other competing demands of the organization. Therefore, the focus of the interventions of the DNP project included the development of the Donabedian model's structure and process components.

Project Sustainability

The outcomes of the diabetic QI initiative included improvements in the structure and processes components that addressed the quality and delivery of care of the diabetic patient population served by the DNP project site. The implications of this initiative included the following interventions: (1) utilization of the SPH QI dashboard software to obtain a baseline of T2DM QI metrics, (2) development of a diabetic QI protocol to educate the clinic staff on EHR documentation regarding diabetes management and the optimal utilization of SPH, (3) the implementation and evaluation of an educational session regarding T2DM QI metrics, and (4) the utilization of the SPH QI dashboard software to obtain the overall changes in T2DM QI metrics. The manner in which each of the four interventions will be sustained in the clinic is explored below.

Optimal use of Quality Improvement dashboard software. This diabetic QI initiative utilized the SPH QI dashboard software to obtain baseline QI metrics. The use of the SPH QI dashboard software was integrated into the structure and processes of the clinic via the publication of a diabetes QI protocol to instruct an assigned staff member with screenshots on how to obtain these quality dashboard reports on a recommended monthly basis. Optimal utilization of this QI dashboard software assists the clinic staff in obtaining QI metric data for

feedback and QI reporting purposes. This QI feedback allows the clinic staff to assess QI progress of attaining benchmarks to achieve reimbursement and to re-attain patient-centered medical home status, should a medical doctor be placed at the DNP project site. This QI data can also assist the clinic in continually improving the quality of diabetic patient care.

Creation of a T2DM quality improvement protocol. This diabetic QI initiative developed and instituted a standardized protocol for the staff and provider documentation of diabetic QI metrics. This protocol and the developed educational materials are a resource for current and future staff to accurately document diabetes care that can be reported in the SPH QI dashboard software. The utilization of this T2DM QI protocol will also assist in the standardization of clinic processes, aiding in quality care delivery.

Increased provider and staff education regarding quality metrics. This diabetic QI initiative included the development of educational materials for current and future staff. After the presentation of the educational session intervention, the clinic staff indicated improved confidence in understanding T2DM QI metrics, influencing a culture change in the office regarding QI metrics. This knowledge will be incorporated into the structure of the clinic staff by influencing how patient care is delivered, as the clinic staff office managers have expressed the intent to utilize the protocol and educational materials when training new staff members.

Improvement of diabetes quality improvement metrics. This diabetic QI initiative provided the rural Midwestern clinic administration with recommendations for the continued improvement of quality indicators. After comparing baseline QI metrics to the post-implementation QI metrics, 5 of the 12 T2DM QI metrics improved significantly. This progress can be continued in a sustainable matter if the clinic continues to utilize the interventions of the DNP project. The educational session intervention and T2DM QI protocol were each designed

to build upon the components of structure and processes of diabetic patient care to improve the T2DM QI metrics. Quality improvement strategies are a continuous process; therefore, the interventions of this DNP project included: (1) obtaining baseline T2DM QI metrics, (2) the creation of a T2DM QI protocol as a sustainable resource regarding electronic health record (EHR) documentation on diabetes management and optimal SPH utilization, (3) the optimization of EHR documentation and SPH QI dashboard software use via an educational intervention session and (4) obtaining, analyzing, and disseminating the overall T2DM QI metric changes of the DNP project. The analysis and dissemination of the T2DM QI metrics will assist the clinic, the affiliated PHO, and the affiliated administration in sustainability planning and possible QI project replication. The cultural change that occurred throughout this DNP project, in addition to the improvement of the clinic staff confidence levels regarding T2DM QI metrics, will also assist in the improvement of T2DM QI metrics over time, as QI strategies are a continuous process, and not all results of the interventions may be apparent immediately. The designed T2DM QI protocol was presented to administration and adopted, and as a result, the administration is considering replication of this protocol in other affiliated offices.

Once the DNP project implementation phase was completed, a sustainability plan was designed to maintain the QI processes and structure that had been developed throughout the DNP project. The recommendations included in the sustainability plan are evidence based. Researchers have demonstrated that multicomponent QI strategies and changes in workflow have been shown to be effective for the sustainability of QI metric initiatives (Ali et al., 2016; Benzer et al., 2014). The QI initiative components were incorporated into the clinic staff's workflow, which positively affected the T2DM QI metrics. The diabetic QI initiative protocol and educational materials were distributed to the clinic staff and will be kept in an accessible, staff-

determined location in the office for future reference. The protocol contains educational materials for current and future staff for education regarding the documentation of T2DM QI metric components. To support further progress in this diabetic QI initiative, recommendations were made to the clinic administration and quality personnel to sustain QI metric improvement for diabetes care in this clinic over time:

- Assign a staff member to run monthly SPH QI dashboard software reports to provide feedback, and then analyze monthly reports to track quality metrics progression. The clinic staff determined that one PA-C and one office manager would be responsible for running SPH QI dashboard software reports, analyzing, and reporting the QI metric results to the clinic staff and administration.
- The PA-Cs and office management should continue to explore the processes of EHR documentation for measures that are below the NCQA diabetes QI targeted percentiles and allocate resources and energy to actively address the improvement of these measures.
- Have members from the PHO QI department visit the clinic quarterly to educate the staff on ongoing QI metric changes, QI needs, and documentation requirements.
- The PA-Cs and office management and affiliated administration should review the SPH QI dashboard reports quarterly and evaluate the QI metrics in line with value-based reimbursement programs, such as re-applying for a patient-centered medical home status, which can be obtained again after the hiring of an on-site physician, in conjunction with improved QI metrics. These reviews can assist the clinic staff to continually identify QI metrics that are below the NCQA targeted percentiles and to develop educational training processes to assist the clinic staff in meeting these targeted percentiles. The affiliated administration of the clinic is ultimately responsible for enacting the active process for

patient-centered medical home status reapplication and coordination of staff, including providers, to meet the patient-centered medical home criteria.

Throughout this DNP project, the utilization and evaluation of the PARiHS framework and the Donabedian model, in addition to the DNP project process of planning, implementation, and evaluation, allowed the DNP student to enact many of the eight American Association for the Colleges of Nursing (AACN) Essentials of DNP Education (American Association of Colleges of Nursing [AACN], 2006).

Essentials of Doctor of Nursing Practice Education

The purpose of the DNP project is to be an enactment of the competencies attained, as outlined in the AACN Essentials of DNP education (AACN, 2006). The DNP Essentials address the foundational competencies required to enact this role as a doctorally prepared advanced practice nurse (Moran et al., 2017; AACN, 2006). The following DNP Essential competencies were addressed with the design and implementation of this DNP project.

Essential I: Scientific Underpinnings for Practice

The first DNP Essential addresses competencies to evaluate information from numerous sources and disciplines to improve patient care delivery (AACN, 2006). The student enacted this Essential by exploring current theories, literature, and practice standards and by evaluating the current practice methods at the rural Midwestern clinic. This exploration and evaluation process allowed the DNP student to design new practice approaches to improve the quality of care provided by the clinic staff. The quality of care at this clinic was improved by incorporating current evidence as reflected in national guidelines to bring up-to-date, current treatment plans to a diabetic population in a rural site.

Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking

This DNP Essential requires the DNP student to develop and utilize skills to navigate a complex organization or healthcare system and successfully implement a change that is meaningful at a macro level (AACN, 2006). A comprehensive organizational assessment assisted in analysis of multicomponent issues related to the low T2DM QI metrics, which required analyzing the complexities of organizational structure from the macro- and micro-system levels, the current trends in QI strategies for chronic disease, and the current reimbursement trends and programs. This skillset was developed throughout the DNP project proposal and intervention design and through the creation of a DNP project budget that employed principles of business, finance, economics, and health policy to develop and implement effective plans for practice-level and system-wide practice initiatives.

Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice

The third Essential emphasizes the DNP skillset needed to implement current research and science into evidence-based practice (AACN, 2006). This competency was attained in the research and development of the literature review, which is a compilation of evidence-based practice, and included QI approaches to guide the DNP project design and evaluation. The DNP student also utilized information technology to acquire quality indicator data from the EHR for the analysis and evaluation of the DNP project outcomes. Analytical and statistical methodologies were also utilized to evaluate the final outcome of the DNP project; the change in T2DM QI metrics was statistically significant after evidence-based interventions were implemented.

Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care

This Essential requires the DNP student to navigate and apply information technology to provide and improve patient care on an individual and population level (AACN, 2006). Navigating and utilizing the SPH QI dashboard software and the EHR to evaluate DNP project interventions demonstrated this skillset. This competency was developed by evaluating weaknesses and strengths of Symphony Performance Health (SPH), a QI dashboard software. This competency was also developed through the use of encrypted emails for data analysis, and through the application process for receiving approval from an institutional review board. The EHR and SPH QI dashboard software were utilized to analyze and communicate the critical elements necessary for the selection, use, and evaluation of healthcare information systems and patient care technology. The clinical knowledge base of the DNP-prepared nurse practitioner student provided insight on the clinical documentation needed by providers for the generation of reports to yield accurate charting of care delivery.

Essential VI: Interprofessional Collaboration for Improving Patient and Population Outcomes

The use of interprofessional collaboration in the healthcare setting and throughout the DNP project is another required Essential competency (AACN, 2006). Interprofessional collaboration improves the safety and quality of patient care (AACN, 2006). This Essential was attained throughout the DNP project, as interprofessional collaboration in the rural Midwestern clinic was essential to the design, implementation, and dissemination of the DNP project outcomes. The completion of the DNP project required the DNP student to collaborate with information technology specialists and statistical experts to determine the significant outcomes accurately.

Completion of this DNP project also required collaboration with QI specialists, ancillary staff, medical providers, and affiliated network administration to develop practice changes in the rural clinic.

Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health

The seventh Essential requires the DNP student to focus on disease prevention and health promotion on a population level (AACN, 2006). The dissemination of this DNP project included outcomes related to the deliverables of (1) a formal diabetic QI protocol, (2) a staff education program intervention that used a survey to evaluate pre- and post-learning confidence, and (3) staff education regarding the optimal use of the Symphony Performance Health (SPH) QI dashboard software. The unique preparation of the DNP-prepared advanced practice nurse assisted in identifying the diabetic care delivery changes required in this clinic by incorporating the epidemiological, biostatistical, and environmental data related to individual and diabetic population needs. The DNP project interventions addressed macro-level needs in order to improve the T2DM QI metrics. This Essential was also met throughout the intervention design, which included addressing the knowledge gaps of the clinic personnel. The final deliverable of this DNP project included (4) the overall comparison of the comprehensive diabetic quality indicator metrics, which implemented both macro- and micro-level interventions focused on the improvement of healthcare quality for a vulnerable population served by the clinic. This deliverable also demonstrated fulfillment of the interventions by evaluating practice changes initiated by this DNP project from a collective perspective, including addressing the unique challenges of the rural population resource scarcity.

Essential VIII: Advanced Nursing Practice

The eighth and final DNP Essential requires the DNP student to provide patient care in a manner reflective of advanced nursing practice, particularly in a specialty area (AACN, 2006). The unique preparation of the DNP-prepared advanced practice nurse assisted in identifying the diabetic care delivery needed in this clinic. The preparation of a DNP-prepared advanced practice nurse assisted in designing a comprehensive approach to address a complex issue from an individual and population delivery perspective. The DNP student also exhibited this skillset by designing a system-level practice change that focused on the documentation gaps of care in the EHR by instructing the rural clinic how to access and utilize the SPH QI dashboard software to provide a means for QI metric feedback.

Dissemination of Outcomes

The dissemination of the DNP project included outcomes related to the deliverables of (1) a formal diabetic QI protocol, (2) a staff education intervention session that evaluated pre- and post-learning confidence via a survey, (3) staff education regarding the optimal use of the Symphony Performance Health (SPH) software, and (4) an overall comparison of the comprehensive T2DM QI metrics. The outcomes of this diabetic QI initiative were disseminated to the university, the organization in which the DNP project took place, and to the general academic nursing community. The DNP student presented the outcomes to the organizational leadership and stakeholders of the DNP project site to assist with the establishment of a sustainability plan, which included consideration for protocol replication at other affiliated clinic sites. The final DNP project was also submitted to the university and to ScholarWorks for publication. Dissemination of this DNP project contributed to the nursing discipline by demonstrating how a multicomponent diabetic QI initiative can improve T2DM QI metrics in a

resource-challenged rural clinic. The DNP student may also submit the outcomes of the DNP project for presentations at various nursing or primary care conferences in order to assist other rural and resource-challenged clinical sites with improving the quality of diabetes management.

Conclusion

The primary goal of this DNP project was to improve patient care outcomes and quality metrics for the diabetic rural population by improving the structure and process components of the organization. This DNP project utilized the Donabedian model to explore the phenomenon of interest, QI strategies, and diabetes management. Utilization of the PARiHS guided the interventions of this DNP project. This DNP project included the following interventions: First, the SPH QI dashboard software was utilized to obtain a baseline of T2DM QI metrics. Dashboard results have the potential to provide feedback and motivation for the staff of the rural Midwestern clinic to continue to make progress towards NCQA diabetic quality metric target percentile goals. Second, a diabetic QI protocol was developed and used to educate clinic staff on EHR documentation regarding diabetes management and optimal utilization of SPH. The diabetic quality indicator protocol allows to clinic staff to utilize a resource on optimal SPH QI dashboard software utilization. This protocol also functioned as a sustainable resource that will allow the clinic to improve their diabetic quality metrics. Utilization and improvements of diabetic quality indicators will continue to help to provide feedback and motivate the improvement of care for diabetic patients-served at this clinic. Third, an educational session intervention on T2DM QI metrics was implemented and evaluated. The staff at this rural Midwestern clinic confirmed with comparison of the pre- and post confidence level survey scores that the educational session intervention improved their confidence levels with diabetic quality indicators. On the post confidence Likert scale survey, all 5 questions showed improved

scores and higher ratings than the confidence level Likert scale surveys taken prior to the educational intervention session (See Appendix M). Lastly, Symphony Performance Health, a QI dashboard software, was utilized to obtain T2DM QI metrics. These results were subsequently statistically analyzed by using independent *t* tests.

Overall, during the 14-month continuous QI initiative, which included both informal and formal results, the interventions yielded statistically significant changes in 5 of the 12 (41.6%) measured diabetic quality indicator metrics from March, 2016 to May, 2017. After the implementation of this DNP project, 4 out of 12 diabetes quality metrics have met the NCQA diabetic QI metric target percentiles. Prior to this DNP project, only one of the metrics met NCQA diabetic QI metric target percentile. More importantly, this DNP project influenced a cultural change at the rural primary care clinic allowing for continuous QI strategies in the future.

The outcomes of this DNP project were disseminated to the DNP project team, members of the university, members of the Midwestern clinic, affiliated administration and to the PHO affiliated with the clinic. The affiliated administration and the PHO affiliated with the clinic are considering replication of the protocol at other clinic sites in the future. Over time, this QI initiative has the potential to improve patient outcomes and provide increased financial stability to the organization by assisting the DNP project site to improve its structure and processes to provide efficient, high-quality, evidence-based diabetes care.

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Appendix A

The Donabedian Model

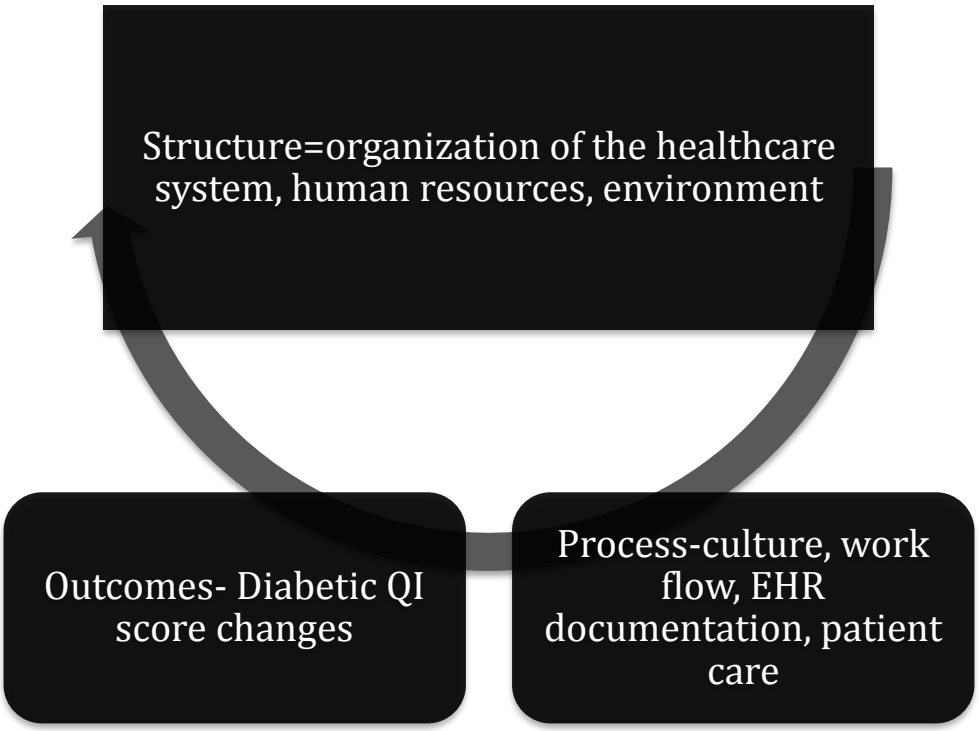


Figure A1: The Donabedian Model. Adapted from: Donabedian, A. (2005). Evaluating the quality of medical care. *Milbank Quarterly, 83(*4), 691-729. Retrieved from https://doi.org/10.1111/j.1468-0009.2005.00397.x. Copyright 2005, John Wiley and Sons. Adapted with permission.

Appendix B

The PARiHS Diagnostic and Evaluative Grid

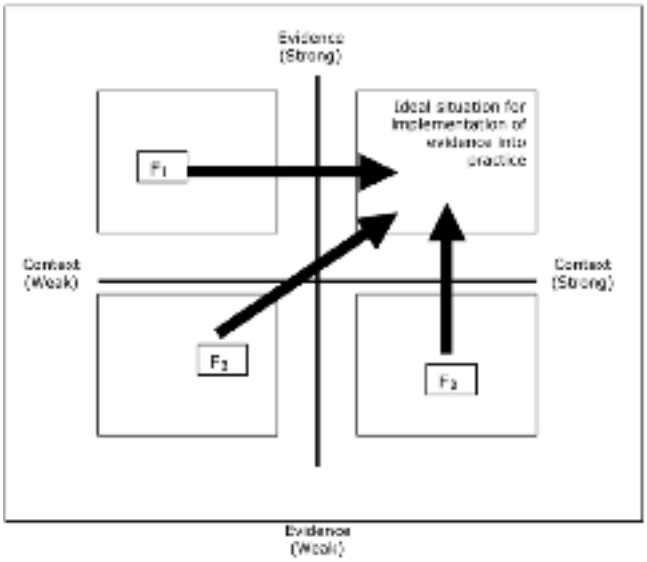


Figure B1. The PARiHS Diagnostic and Evaluative Grid. Taken from: Kitson, A. L., Rycroft-Malone, J., Harvey, G., McCormack, B., Seers, K., & Titchen, A. (2008). Evaluating the successful implementation of evidence into practice using the PARiHS framework: Theoretical and practical challenges. *Implementation Science, 3*. Copyright 2008 Kitson et al., licensee BioMed Central Ltd. Used with permission of the Creative Commons License.

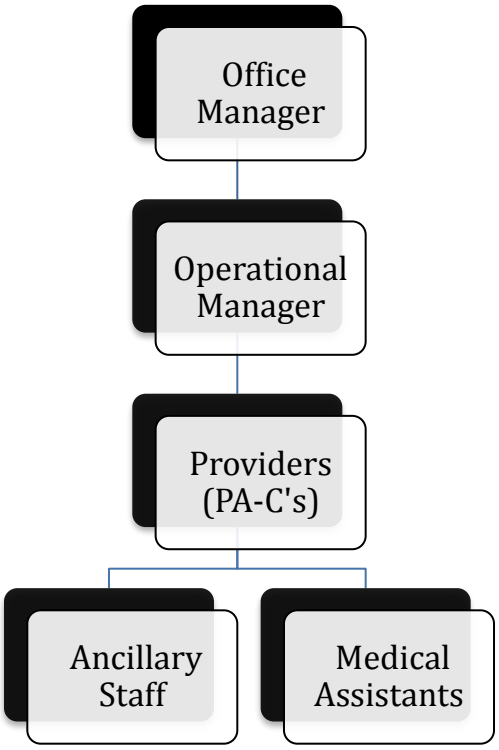
Appendix C

SWOT Analysis of DNP Project Site

Strengths	**Opportunities**
• Strong leadership from office providers and affiliated corporate medical group administration. • This clinic is part of a fully integrated health network committed to quality evidence-based patient care and cost efficiency. • Affiliated corporate medical group support from the QI team and affiliated QI PHO members. • Motivation and dedication to improving quality metrics from clinic providers. • Access to new Symphony Performance Health (SPH) quality metric software to provide quality metric reports and feedback to clinic providers and affiliated corporate medical group administrations.	• Improve the comprehensive diabetic quality metrics. • Improve office workflow of the clinic. • Introduce Symphony Performance Health QI dashboard software. • Educate staff on importance of quality metrics and reimbursement. • Educate staff on workflow improvements and locations for documenting assessment data for successful query by SPH software. • Educate the providers on SPH use to offer a means of feedback. • Potential to eventually place a new Medical Doctor on site.
Weaknesses	**Threats**
• Lack of communication among staff members. • Lack of understanding regarding importance of quality metrics by the medical assistants. • Heavy patient care volumes for providers. • Lack of a diabetic educator. • Frequent utilization of temporary staff from other affiliated ambulatory offices. • Lack of provider understanding on where to chart T2DM patient care aspects for quality software, ie. SPH, to query data. • Collective and exclusive nature of SPH software. • Lack of a Medical Doctor on site. • PA-C's QI metrics linked to scores of the physician overseeing office.	• Loss of Blue Cross Blue Shield Patient Centered Medical Home designation, which could affect patient population and insurance coverage. • Potential closure of clinic affiliated corporate medical group, Joint Commission or Center for Medicaid and Medicare Services, if improvements are not made. • Government regulations.

Appendix D

Organization Chart of Clinic



Appendix E

Educational Confidence Pre- and Post-Assessment Survey Measurement Tool

Staff Role _____

Age Group 18-30____ 31-40_____ 41-50_____ 51-60_____ 61 or older_____

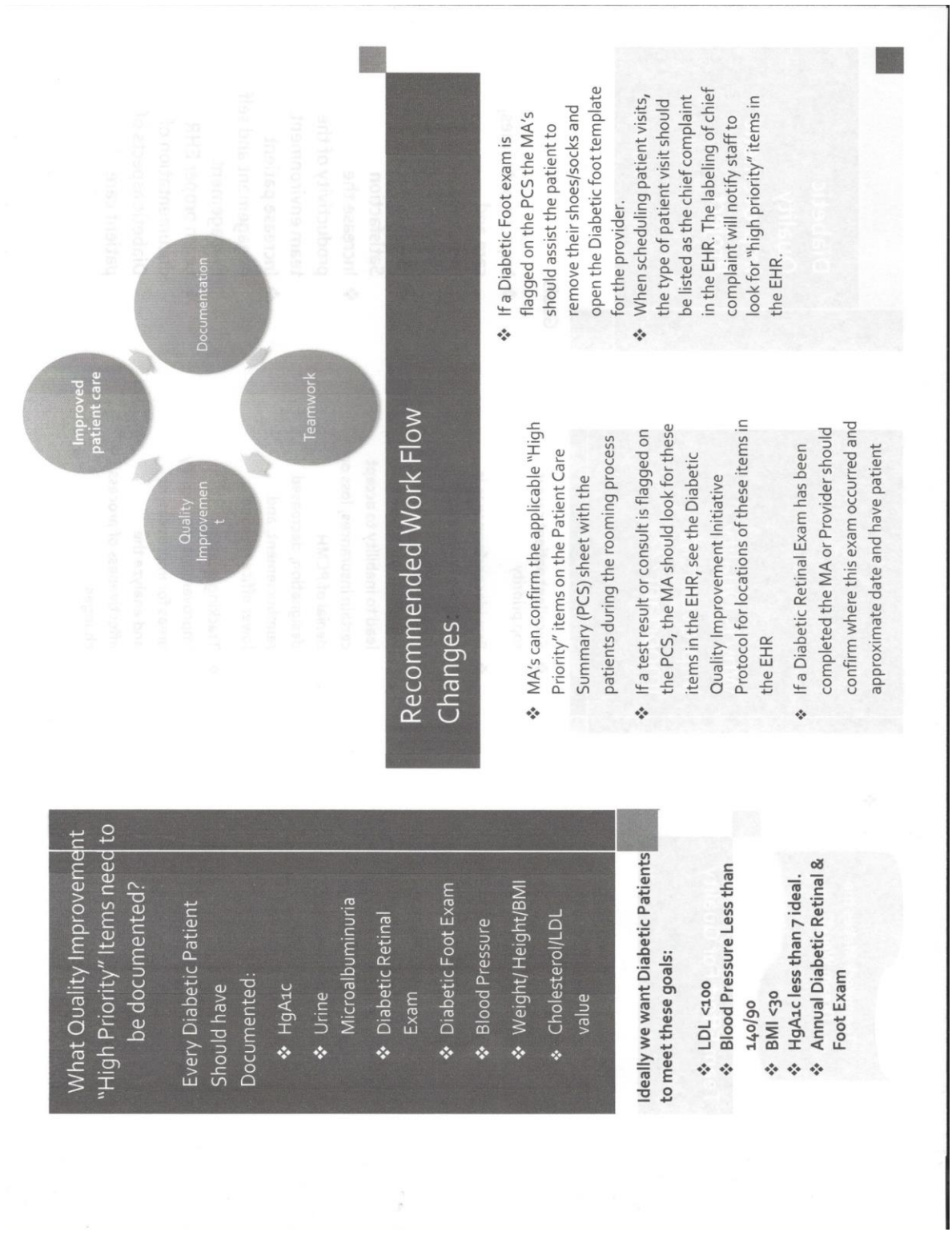
For each of the statements below, circle the response that best characterizes how confident you feel about the statement, in which 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
I am able to describe the purpose of Diabetic Quality Indicators.	1	2	3	4	5
I am able to describe the importance of Diabetic Quality Indicators.	1	2	3	4	5
I am able to describe how to contact the DNP student or the Affiliated Medical Group team members if I have questions about Diabetic Quality Indicators.	1	2	3	4	5
I am able to describe my responsibilities in documenting patient care in the EHR.	1	2	3	4	5
I am able to describe how to access the designed Diabetic Quality Indicator Protocol to assist in documenting Diabetic Quality Indicator Metrics.	1	2	3	4	5

Please list any comments or concerns you have related to this QI initiative:

_____
_____
_____
_____

Appendix F: Educational Materials of the Project



"Teamwork Makes the Dream Work!"

Team Effort For Quality

- ❖ Every staff member contributes to quality performance
- ❖ Receptionists collect and verify patient information in the EHR during scheduling and check in.
- ❖ MA's review the Patient Care Summary (PCS) sheet with the patient to verify the status of "High Priority" items
- ❖ MA's obtain any missing reports and scan them into the appropriate EHR location.
- ❖ Providers manage patient care and order required testing
- ❖ MA's and Providers document patient care.

Why is Quality Improvement Important???

- ❖ Excellent patient care is top priority
- ❖ Provider performance is publically reported.
- ❖ Poor Quality Improvement scores can lead to inability to accept certain insurances, loss or denial of PCMH designation, decreased reimbursement, and lower office revenue.
- ❖ Tracking quality improvement can identify areas for improvement and analyze the effectiveness of process changes

Diabetic Quality Improvement Project

Goals:

- ❖ Improve outcomes, care and reimbursement of Diabetic Patients
- ❖ Increase Patient Satisfaction
- ❖ Increase the productivity of the team environment
- ❖ Increase patient engagement and self management
- ❖ Learn proper EHR documentation of Diabetic aspects of patient care

Appendix G

Table G1

Diabetic QI Metric Changes

MEASURE NAME	MARCH 2016 SCORES Time 1	APRIL 2017 SCORES Time 2	MAY 2017 SCORES Time 3	NCQA TARGET PERCENTILE	Percentage Change March 2016 - April 2017 Time 1	Percentage Change April 2017- May 2017 Time 2	Percentage Change March 2016 - May 2017 Time 3
Attention to Nephropathy if Albuminuria	100% (n= 2/2)	100% (n=2/2)	100% (n=8/8)	90% (90TH PERCENTILE)[1]	NA 0%	NA 0%	NA 0%
Blood Pressure < 140/90	56% (n=178/317)	61% (n= 238/389)	68% (n= 291/424)	75% (90TH PERCENTILE)[1]	5%	7%	12%
Blood Pressure Exams	70% (n= 223/317)	74% (n= 287/389)	73% (n= 311/424)	75% (90TH PERCENTILE)[2]	4%	-1%	3%
Body Mass Index	76% (n= 240/317)	79% (n=305/388)	77% (n=328/423)	91% (90TH PERCENTILE)[1]	3%	-2%	1%
Diabetic Foot Exam	0% (n= 0/317)	50% (n= 196/389)	55% (n= 236/424)	80% (COMPARATIVE VALUE)[3]	50%	5%	55%
Dilated Retinal Exam	20% (n= 62/317)	17% (n= 68/389)	17% (n= 74/424)	70% (90TH PERCENTILE)[1]	-3%	NA 0%	-3%
HbA1C < 7 (Age < 65)	29% (n=51/175)	25% (n= 57/225)	34% (n= 83/424)	37% (COMPARATIVE VALUE)[3]	-4%	9%	5%
HbA1C < 8 (Age ≥ 65)	63% (n= 90/142)	63% (n= 104/164)	68% (n= 124/182)	68% (90TH PERCENTILE) [1]	NA 0%	5%	5%
HbA1C < 9	7% (n= 21/317)	63% (n= 246/389)	65% (n= 276/424)	22% (75TH PERCENTILE)[2]	56%	2%	58%
HbA1C Exams	41% (n= 131/317)	43% (n=166/389)	49% (n= 208/424)	92% (75TH PERCENTILE)[2]	2%	6%	8%
LDL < 100	32% (n= 100/317)	33% (n= 127/389)	35% (n= 148/424)	34.7% (COMPARATIVE VALUE)[3]	1%	2%	3%
LDL Exam	59% (n= 186/317)	61% (n=236/389)	64% (n= 274/424)	88% (75TH PERCENTILE)[2]	2%	3%	5%

Table G2

Comparing Diabetic Quality Metric Scores Using T-Test with a 95% Confidence Interval

MEASURE NAME	MARCH 2016 SCORES COMPARED TO APRIL 2017 SCORES Time 1	APRIL 2017 SCORES COMPARED TO MAY 2017 SCORES Time 2	MARCH 2016 SCORES COMPARED TO MAY 2017 SCORES Time 3
Attention to Nephropathy if Albuminuria	**NA - No Change**	**NA - No Change**	**NA - No Change**
Blood Pressure < 140/90	T-statistic -1.351, P-value 0.0887, Not significant	**T-statistic -2.228, P-value 0.01311, Significant**	**T-statistic -3.482, P-value 0.00027, Significant**
Blood Pressure Exams	T-statistic -1.01, P-value 0.15648, Not significant	T-statistic 0.139, P-value 0.55521, Not significant	T-statistic -0.897, P-value 0.18504, Not significant
Body Mass Index	T-statistic -0.91, P-value 0.18156, Not significant	T-statistic 0.367, P-value 0.64313, Not significant	T-statistic -0.582, P-value 0.28063, Not significant
Diabetic Foot Exam	**T-statistic -19.867, P-value 0.0, Significant**	T-statistic -1.507, P-value 0.06608, Not significant	**T-statistic -23.071, P-value 0.0, Significant**
Dilated Retinal Exam	T-statistic 0.706, P-value 0.75962, Not significant	T-statistic 0.01, P-value 0.50417, Not significant	T-statistic 0.728, P-value 0.76658, Not significant
HbA1C < 7 (Age < 65)	T-statistic 0.847, P-value 0.80137, Not significant	T-statistic 1.654, P-value 0.95056, Not significant	T-statistic 2.429, P-value 0.99213, Not significant
HbA1C < 8 (Age ≥ 65)	T-statistic -0.006, P-value 0.49752, Not significant	T-statistic -0.924, P-value 0.178, Not significant	T-statistic -0.894, P-value 0.18621, Not significant
HbA1C < 9	**T-statistic -20.108, P-value 0.0, Significant**	T-statistic -0.551, P-value 0.2908, Not significant	**T-statistic -21.625, P-value 0.0, Significant**
HbA1C Exams	T-statistic -0.361, P-value 0.35909, Not significant	**T-statistic -1.829, P-value 0.03394, Significant**	**T-statistic -2.101, P-value 0.01802, Significant**
LDL < 100	T-statistic -0.312, P-value 0.3775, Not significant	T-statistic -0.68, P-value 0.24823, Not significant	T-statistic -0.963, P-value 0.16789, Not significant
LDL Exam	T-statistic -0.537, P-value 0.29567, Not significant	T-statistic -1.165, P-value 0.12219, Not significant	**T-statistic -1.647, P-value 0.05, Significant**

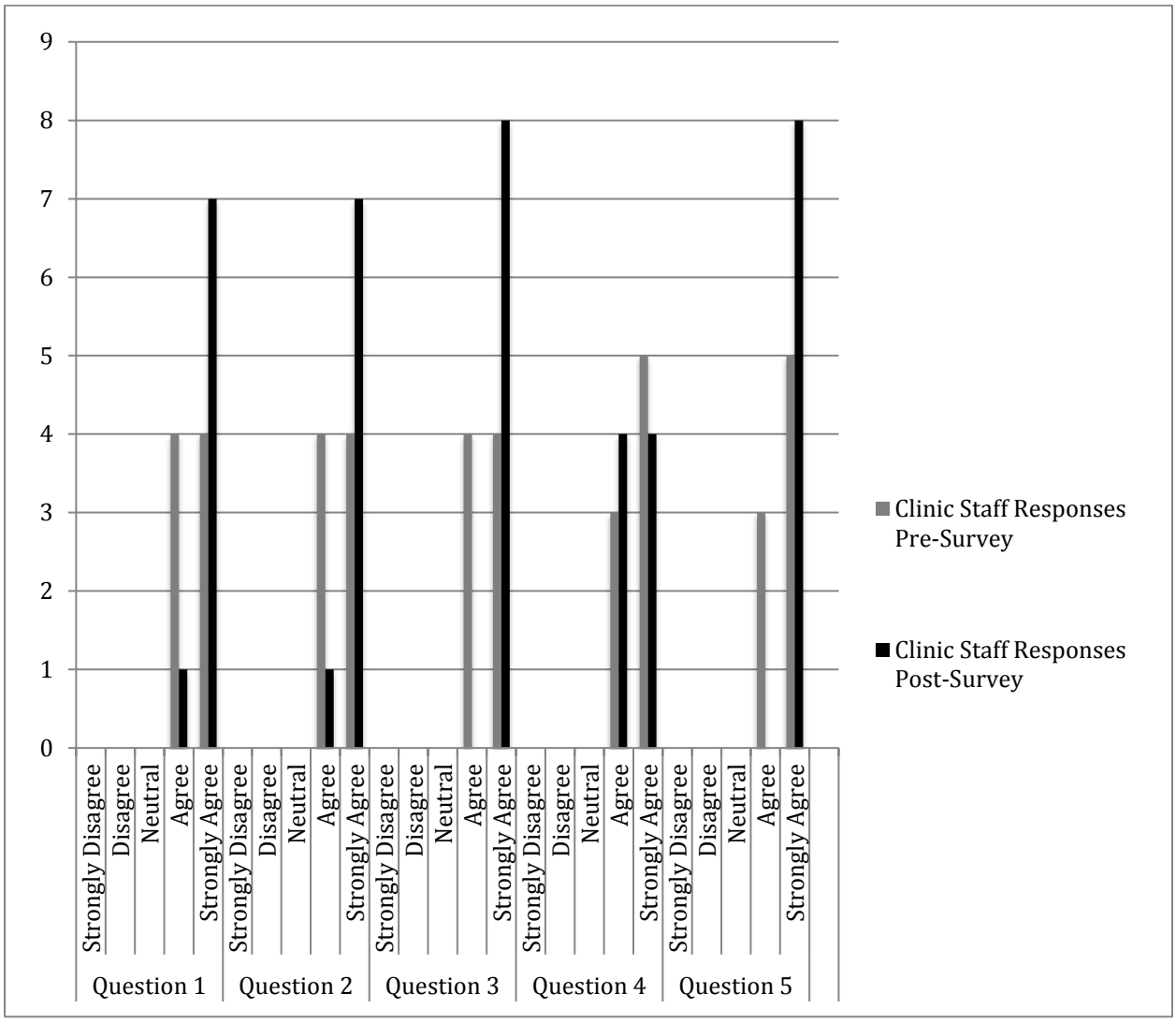
[1] NCQA. (2017). Benchmarks and thresholds 2017 accreditation. Retrieved from http://www.ncqa.org/tabid/123/Default.aspx

[2] NCQA. (2015). Benchmarks and thresholds 2015 accreditation. Retrieved from http://www.ncqa.org/publications-products/other-products/quality-profiles/focus-on-diabetes/what-is-the-current-state-of-quality-of-care

[3] NCQA. (2003). What is the current state of quality of care diabetes? Retrieved from http://www.ncqa.org/publications-products/other-products/quality-profiles/focus-on-diabetes/what-is-the-current-state-of-quality-of-care

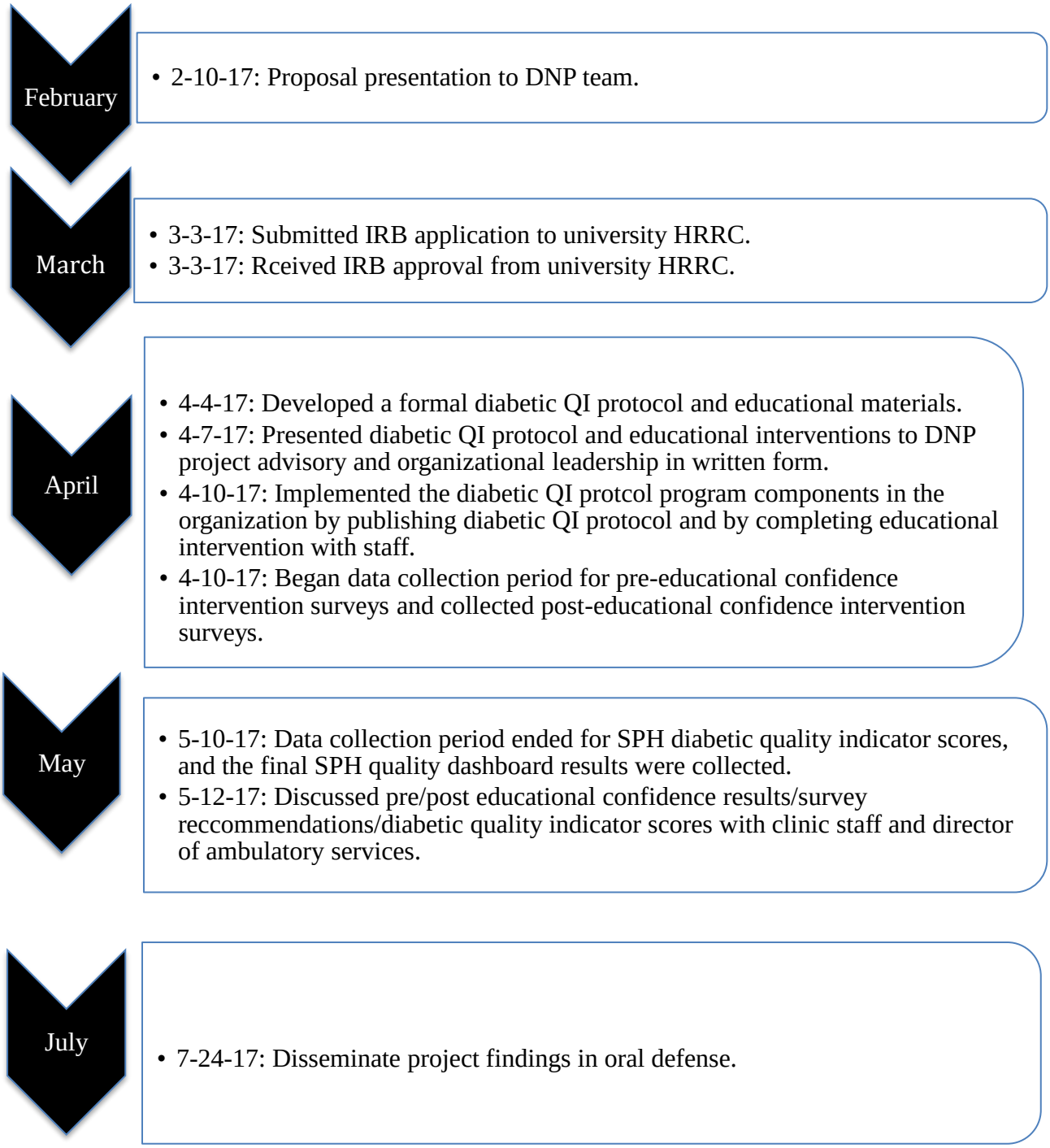
Appendix H

Pre- and Post-Educational Session Intervention Confidence Level Survey Results



Appendix I

DNP Project Timeline



Appendix J: Determination Letter

GRAND VALLEY STATE UNIVERSITY
www.gvsu.edu

DATE:	March 3, 2017
TO:	Jodi Drenth, DNP
FROM:	Grand Valley State University Human Research Review Committee
STUDY TITLE:	[1039072-1] A Quality Improvement Initiative to Provide Comprehensive Diabetic Management in a Rural Midwestern Clinic.
REFERENCE #:	17-171-H
SUBMISSION TYPE:	Non-Human Subject Research Determination Form
ACTION:	Not Research
EFFECTIVE DATE:	March 3, 2017
REVIEW TYPE:	Administrative Review

Thank you for your submission of materials for your planned research study. It has been determined that this project:

DOES NOT meet the definition of covered human subjects research* according to current federal regulations. The project, therefore, *DOES NOT* require further review and approval by the HRRC.

The proposed study is a quality improvement project for a single clinic, and therefore the study is not "designed to develop or contribute to generalizable knowledge." If you have any questions, please contact the Office of Research Integrity and Compliance at (616) 331-3197 or rci@gvsu.edu. Please include your study title and reference number in all correspondence with our office.

*Research is a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge (45 CFR 46.102 (d)).

Human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains: data through intervention or interaction with the individual, or identifiable private information (45 CFR 46.102 (f)).

Scholarly activities that are not covered under the Code of Federal Regulations should not be described or referred to as "*human subjects research*" in materials to participants, sponsors, or in dissemination of findings.

Office of Research Compliance and Integrity| 1 Campus Drive | 049 James H Zumberge Hall | Allendale, MI 49401
Ph 616.331.3197 | rci@gvsu.edu | www.gvsu.edu/rci

Appendix K

Doctor of Nursing Practice Project Budget

Table K1

Projected Staff Expenditures for the Diabetic QI Educational Intervention

Title	Number of Staff (N=10)	Average Hourly Wage	Number of Hours	Cost
Physician Assistant	2	$44.96	1	$121.92
Office Manager	2	$16.00	1	$32.00
Certified Medical Assistant	3	$14.06	1	$42.18
Secretary	1	$12.71	1	$12.71
Director of Ambulatory Services	1	$56.60	15	$849.00
DNP Student	1	$40.00	100	
			TOTAL:	$1,057.81

Table K2

Overall Budget Expenditures

Projected Staff Expenditures	
	($1,057.81)
Project Revenue (in-kind donation of DNP student hours + printer + computer)	$5,600
TOTAL:	$4,542

Appendix L

Project Site Demographics

	Staff Member Demographics (N = 8)
	N (%)
Position/Role	
Physician Assistant	2 (25%)
Office Manager	2 (25%)
Medical Assistant/Secretary	4 (50%)
Gender	
Female	7 (87.5%)
Male	1 (12.5%)
Age	
Less than 60	7 (87.5%)
Greater than 60	1 (12.5%)

Appendix M

Pre- and Post-Educational Session Intervention Confidence Level Scores

(N=8)	**Question**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Pre	1	0	0	0	4	4
	2	0	0	0	4	4
	3	0	0	0	4	4
	4	0	0	0	3	5
	5	0	0	0	3	5
Post	1	0	0	0	1	7
	2	0	0	0	1	7
	3	0	0	0	0	8
	4	0	0	0	4	4
	5	0	0	0	0	8

Appendix N

Significant Changes in the T2DM QI Metrics

MEASURE NAME	MARCH 2016 SCORES COMPARED TO APRIL 2017 SCORES Time 1	April 2017 SCORES COMPARED TO MAY 2017 SCORES Time 2	MARCH 2016 SCORES COMPARED TO MAY 2017 SCORES Time 3
Attention to Nephropathy if Albuminuria	**NA - No Change**	**NA - No Change**	**NA - No Change**
Blood Pressure < 140/90	T-statistic -1.351, P-value 0.0887, Not significant	**T-statistic -2.228, P-value 0.01311, Significant**	**T-statistic -3.482, P-value 0.00027, Significant**
Diabetic Foot Exam	**T-statistic -19.867, P-value 0.0, Significant**	T-statistic -1.507, P-value 0.06608, Not significant	**T-statistic -23.071, P-value 0.0, Significant**
HbA1C < 9	**T-statistic -20.108, P-value 0.0, Significant**	T-statistic -0.551, P-value 0.2908, Not significant	**T-statistic -21.625, P-value 0.0, Significant**
HbA1C Exams	T-statistic -0.361, P-value 0.35909, Not significant	**T-statistic -1.829, P-value 0.03394, Significant**	**T-statistic -2.101, P-value 0.01802, Significant**
LDL Exam	T-statistic -0.537, P-value 0.29567, Not significant	T-statistic -1.165, P-value 0.12219, Not significant	**T-statistic -1.647, P-value 0.05, Significant**

Appendix O

Diabetic QI Metrics Meeting the NCQA Targets

MEASURE NAME	MARCH 2016 SCORES	APRIL 2017 SCORES	MAY 2017 SCORES	NCQA TARGET PERCENTILE
Attention to Nephropathy if Albuminuria	100% (n= 2/2)	100% (n= 2/2)	100% (n= 8/8)	90% (90TH PERCENTILE)[1]
HbA1C < 8 (Age ≥ 65)	63% (n= 90/142)	63% (n= 104/164)	68% (n= 124/182)	68% (90TH PERCENTILE) [1]
LDL < 100	32% (n= 100/317)	33% (n= 127/389)	35% (n= 148/424)	34.7% (COMPARATIVE VALUE)[3]