

QUALITY IMPROVEMENT PROJECT TO IMPROVING
DIABETIC RETINOPATHY SCREENING IN A
PRIMARY CARE PROVIDER'S PRACTICE

by

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A scholarly project submitted in partial fulfillment
of the requirements for the degree

Doctor of Nursing Practice

in

Family Nurse Practitioner

MONTANA STATE UNIVERSITY
Bozeman, Montana

May 2023

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ABSTRACT

BACKGROUND: Diabetic retinopathy (DR) continues to be the leading cause of blindness among the working-age population. The aim of this study was to improve DR screening (DRS) rates within primary care through the implementation of a patient questionnaire and follow-up intervention. The study was conducted at a rural primary care provider's office.

METHODS: SEIPS 3.0 model was used specifically, and the journey map was applied during diabetes office visits to assess processes and influences impacting DRS. An intervention supported by current evidence was created to address identified barriers to screening.

INTERVENTION: The project lead and healthcare providers collaboratively created a DRS questionnaire and new process (i.e., record and fax) to be implemented during every diabetic mellitus follow-up visit.

RESULTS: Of the 17 patients with diabetes, 15 (88%) received the DRS paperwork. Three (20%) had not completed their DRS, and 12 had. 11 of the 12 had current ophthalmology notes and the EMR was updated. Request of information (ROI) was faxed to ophthalmologists for the patients who did not have a current DRS note or had not completed DRS. Two ROIs were returned with DRS date. During the project, 87% of patients evaluated had their DRS date entered into the EMR, and office-wide there was a 13% increase in total DRS rates.

CONCLUSIONS: Action to address low DRS rates needs to address the multifaceted barriers that make standardizing DRS difficult. This project led to improvements in DRS rates, but the site eluded to not continue the new process. Prolonged interactions may identify barriers to sustaining the new process.

CHAPTER ONE

IMPROVING DIABETIC RETINOPATHY SCREENING: LITERATURE REVIEW

Diabetes and its associated complications are a growing concern in healthcare that affects 1 out of every 10 Americans, or approximately 37.3 million individuals (Centers for Disease Control and Prevention [CDC], 2021). Diabetes is beginning to impact younger populations compared to previous years, with an upward trajectory of new cases year after year (Khan et al., 2020). Projections for 2030 are expected to increase to a little over 7% of the population, up from 6% (Khan et al., 2020). In 2017, it was estimated that \$237 billion in direct medical costs were incurred (American Diabetes Association [ADA], 2018). Persons with diabetes spend, on average, 2.3 times more on healthcare costs when compared to their counterparts (ADA, 2018). There are not only individual direct costs but also indirect and societal costs. According to the ADA (2018), these include work absenteeism (\$3.3 billion), inability to work (\$37.5 billion), reduced work productivity (\$26.9 billion), and mortality (\$19.9 billion). These cost estimates highlight the financial burden that diabetes plagues the US healthcare system. To help reduce this burden, resources must be allocated toward the prevention of diabetes and its associated complications by strengthening primary care clinics (Khan et al., 2020). Without interventions implemented to address diabetes and its complications, the epidemic will continue to spiral out of control.

DR is the most frequent complication of type 1 and 2 diabetes, impacting roughly 1/3 of all diabetic populations worldwide (Kusuhara et al., 2018; Simo-Servat et al., 2019). To make matters worse, a national survey showed that 73% of adults with diabetic retinopathy (DR) were unaware of their condition or the severity (Skaggs et al., 2017). DR is a microvascular

complication of diabetes, most commonly due to poor glycemic control. The capillaries within the retina cannot sustain homeostasis with elevated blood sugars over a prolonged period, and this gradual progression of retinal damage can lead to permanent visual field changes (Buffolino & Park, 2019). The leading complication caused by DR is blindness in the working-age population (Buffolino & Park, 2019). DR can be caught early on in disease progression with appropriate preventive screening. The ophthalmic screens are completed on diabetic individuals, even if they are asymptomatic (Simo-Servat, 2019). Even with the knowledge of the potential progression to permanent blindness, the general population of diabetics within the United States fail to complete their annual preventive screen. Annual screening for DR is recommended for both type 1 and 2 diabetics per the American Academy of Ophthalmology's Diabetic Retinopathy Preferred Practice Pattern (Flaxel et al., 2019). The current recommendation for DR screening is for PCPs to have a goal of 80% or greater screening rate for their diabetic patients. On average, the literature states that the current US DR screening rate ranges from 55–63% (Lu et al., 2016). With clear standards of care established. There is still a 20–30% deficit below the established standards of care for DR preventive screening.

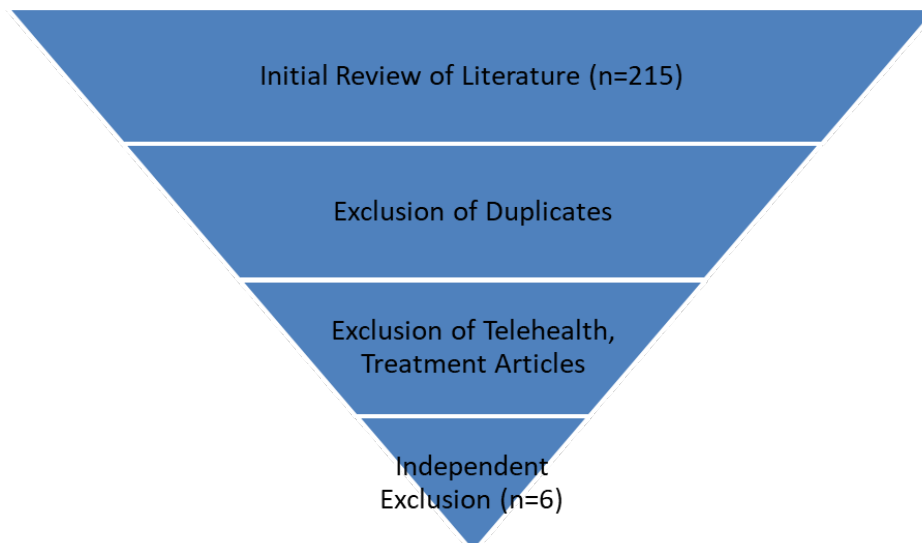
Minimal changes have been made in primary care clinics despite all of the research indicating a growing diabetic population with increased DR rates. Further studies and interventions aimed at preventive healthcare are needed to address this growing concern. Evidence suggests that by meeting the preventive aspect of diabetes with the same rigor as treating the disease, improvements in care will be made (ADA, 2018). Updated EMR systems with alerts notifying providers have proven helpful and successful in aiding patients in improving their annual exam rates and preventive practices. However, there are gaps in the

research on how to combat the gaps in patient DR screenings. This is a systematic review of the literature from 2007 to 2022 that aims to address the gap in diabetic retinopathy screening rates in practice.

Methods

An initial literature review of the CINAHL, PubMed, and PsychINFO databases was conducted using the following terms: “diabetic retinopathy,” “screening,” “primary care,” “improving,” and “intervention” for dates 2007–2022. This search yielded 215 results. The inclusion criteria for the articles were those published in the English language, full-text articles, peer-reviewed, case studies, and systematic reviews. Exclusion criteria included telehealth or treatment articles. This exclusion criteria was implemented to remove reactive medicine rather than preventive and to remove out-of-office interventions. Independent screening of articles narrowed the selection down to six. These six articles were selected for their specificity surrounding interventions for improving diabetic retinopathy screening rates.

Figure 1. Decision tree for search terms



Results

National Guidelines for Recommendation

Diabetic preventive screening standards of care are established by two organizations. This literature review found a gap in practice with low DR screening rates in primary care practices. DR is the leading cause of preventable blindness in working-age adults. There are two different US screening programs that clinicians can incorporate into practice. These two programs are the ADA and the International Council of Ophthalmology (ICO). The current recommendations for DR screening of both the ADA and ICO vary slightly based on DR severity (Vujosevic et al., 2020). The recommended screening interval increases with the severity of DR, with the minimum screening interval being 1 year (Vujosevic et al., 2020).

Barriers to Diabetic Retinopathy Screening

The literature lists multiple DR screening barriers: lack of time, denial, fear, financial burdens, EMR utilization, educational levels, language barriers, and lack of facilities in lower socioeconomic areas (Skaggs et al., 2017; Lu et al., 2016). There are differences seen in screening rates based on socioeconomic, ethnic, and geographical locations. There is a large difference, on average 30% less, in screening rates in the Native American and Hispanic populations nationally (Skaggs et al., 2017). Individuals without adequate access to healthcare do not receive preventive screenings. Rural communities lack the specialties of ophthalmology to perform appropriate screening exams, and the PCPs to educate their DM patients about the importance of annual DRS. The ADA (2018) stated that ethnic groups of Hispanic and African American heritage pay more financially for their diabetes healthcare compared with the

population as a whole. This financial burden creates another barrier to preventive screening. Without allocating resources to these underserved populations DR will continue to climb.

Possible Interventions

The literature identifies a need for DR screening intervention, but it also denotes the difficulties surrounding the complexity of the individual patient, individual clinic, resources available, patient involvement, and healthcare staff endorsement (Riordan et al., 2020).

Lawrenson et al. (2018) found that any DR screening intervention applied to practice increased rates by 12% compared to the status quo. Riordan et al. (2020) recommended that an intervention to improve DR screening rates should include combined theory, stakeholder involvement, and current evidence into a multi-step intervention that is personalized for each patient. Zhang et al. (2007) conducted a systematic literature review of 45 studies with 162,157 participants who were examined with a focus on patients, practices, and healthcare infrastructure and processes. The findings of this literature review stated that increased DR patient education, improved practice performance, and the improved process significantly increases DR screening rates (Zhang et al., 2007). Lawrenson et al. (2018) also reported these findings. In their systematic review, they found four main themes that came to the forefront: (1) reduce inconvenience to patients, (2) increase awareness of DR education, (3) increase patients' sense of support, and (4) improve communication (Lawrenson et al., 2018). A 2016 article by Keenum et al. (2016) found that understanding DR through education and recommended eye care for preventing vision loss would increase follow-up rates. They also found that screening rates were increased with older patients and if the patient had knowledge of their hemoglobin A1C (Keenum et al., 2016).

Decreasing the literature-defined barriers improves DR follow-up screening rates. The newer

technologies also aid practitioners in reaching the higher-risk populations that are included in lower socioeconomic classes and ethnic minorities (Vujosevic et al., 2020). A DR screening intervention at the organizational level should include changes to the structure or organization of the PCP's team with improved EMR patient tracking and documenting (Lawrenson et al., 2018). Increasing efficiency within education, practice performance, and improving processes will increase DR screen rates in primary care.

Discussion

Diabetes and DR will continue to climb in the coming decades as rates show no sign of the curve flattening. DR will impact a third of diabetic patients, regardless of demographics, without a change in practice. The development of blindness associated with DR is preventable if screenings are conducted systematically. The ADA guidelines are clear; all diabetic patients should complete an annual DR eye exam. The literature suggests that there is not a simple "one-size-fits-all" intervention for increasing DR screening rates in practice. However, the literature suggests that any intervention will have a net positive result in improving DR screening rates. A common area of concern in the literature is a lack of knowledge or concern from patients about DR and the potential negative impact. This lack of educational information and concern from patients is an area that PCPs can address via increased communication, EMR utilization, education, and patient reminders about the need to complete their annual screenings. There is new literature coming to the surface about telehealth opportunities with DR screening, but more research is needed to evaluate this as an effective avenue of screening. Through this systematic literature review, it is clear that to increase DR screening rates, the intervention needs to be

personalized to the healthcare system as a whole along with decreasing the barriers experienced by patients.

A change in practice standards or policies is needed to implement an intervention successfully. Endorsement by all healthcare staff ensures the success of the intervention. Implementation of the new policy and intervention conducted at every diabetic visit going forward ensures standardization of the new care processes and increases the success rate and improvement in preventive screening rates. Without this standardization, variation will lead to a return to old practice standards and a continued GAP in standards of care. Organizational buy-in from all staff about the importance of DR screening addressed at implementation and personnel and education aids in increased adherence to practice change.

Conclusion

Based on this literature review, there is a need for interventions to be implemented into PCPs' practices to increase DR screening rates. This preventive medicine supports decreasing healthcare costs and visual impairment complications. The literature is clear that if this change in practice originates from an organizational system level and is endorsed by healthcare staff, it will likely be successful. It is clear throughout the literature that improving screening rates for DR needs to be a focus in primary care to help reduce the increasing rates of DR and its complications. Primary care clinics should be educated about the barriers and equipped with education and new tactics for improving DR preventive screenings.

CHAPTER TWO

IMPROVING DIABETIC RETINOPATHY SCREENING: PROJECT PLAN/PROTOCOL

Introduction and Problem

Diabetes is a growing concern nationally as 37.3 million individuals are affected (CDC, 2021). The projected rate of diabetes is expected to increase to greater than 7% of the population in the United States by 2030 (Khan et al., 2020). Individuals pay 2.3 times more in healthcare costs if they are affected by diabetes (ADA, 2018). The annual societal costs occur in the form of absenteeism (\$3.3 billion), inability to work (\$37.5 billion), reduced work productivity (\$26.9 billion), and mortality (\$19.9 billion). The most common complication associated with diabetes is DR, affecting roughly 1/3 of the diabetic population (Kusuhara et al., 2018; Simo-Servat et al., 2019). DR is a microvascular complication that can lead to progressive permanent retinal damage, causing vision loss (Buffolino & Park, 2019). There is a gap in patient knowledge and DR screening rates. 73% of persons with DR were unaware of their condition or the severity of the problem (Skaggs et al., 2017). DR is preventable if caught early with recommended annual screenings by both the ADA and the International Council of Ophthalmology (ICO). The average DR screening rates within the US for individuals diagnosed with diabetes ranges from 55-63% (Lu et al., 2016), more specifically 62.3% identified by Gibson (2018). The goals identified in Healthy People 2030 led Gibson (2018) to improve DR rates to 67.7%. Implementing an intervention is crucial to improving DR screening rates and preventing diabetic patients from becoming blind.

Problem Statement

There is a need to improve DR screening rates as the current system is not systematic, consistent, and thorough. The quality improvement (QI) clinical site has an average DR screening rate of 61% across all physicians. This leads to the following question: What intervention can be implemented into practice to aid in the improvement of DR screening rates? More questions that come to mind are: What barriers do patients face surrounding DR, and what workflow issues are identified within the practice that could improve DR screening rates? An intervention aimed at reducing barriers and improving workflow efficiency will likely yield the best results in improving DR screening rates.

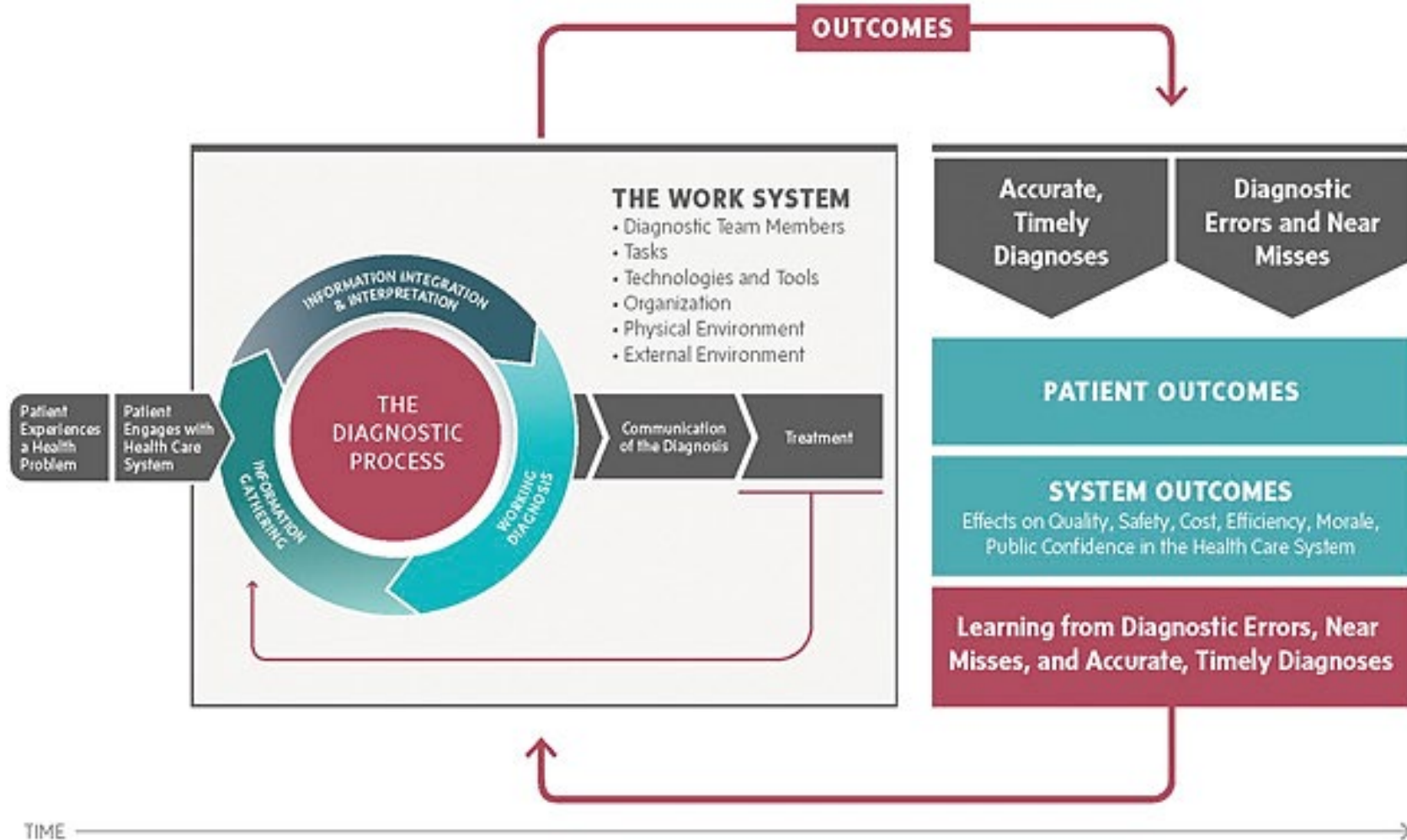
Organizational Microsystem Assessment

The literature identifies a national deficit in DR screening rates that is echoed in the identified microsystem. The DR screening deficit needs to be met with an intervention to improve DR screening rates and prevent the progression of vision loss to blindness. The site organization has a computer application that is able to track all of the quality measures on every patient based on data pulled from the EMR. With the use of the organization's application, data on DR screening rates is identified at 56% across all physicians. The current DR screening rate for the microsystem identified for the QI project has a DR screening rate of 61%. Barriers identified through discussion with stakeholders were EMR utilization, DR screening data entry, patient reliability, and communication. Collaboration with the quality improvement team (explained in Context below) determined the QI project to be improving DR screening rates.

Rationale

We used the Systems Engineering Initiative for Patient Safety (SEIPS) 3.0 model (Sociotechnical Systems Approach to Patient Journey and Patient Safety) to look at the patient journey within the healthcare system, which is influenced by the environment, tasks, tools, and technologies that all influence patient safety and outcomes.

Figure 2. SEIPS 3.0 Model (Caravon et al., 2020)



The SEIPS model was implemented to help develop an understanding of our target population's journey through their visit and assist in intervention development. By implementing the SEIPS model, this allowed for intervention development to be conducted via understanding the different influences such as tasks, environment, tools and technologies, and healthcare team roles. The SEIPS model highlighted the areas for improvement within the PCP's office and identified barriers as to why individuals' DR screening rates are low. We identified an intervention that would be likeliest to improve DR screening rates by addressing both the area for improvement in practice and patient barriers identified within the SEIPS model.

Specific Aims

The QI project aims to improve DR screening rates in order to prevent the progression to blindness. DR is a quality indicator for managing diabetes. Improving DR screening rates will reduce the number of patients afflicted with visual loss and blindness, our ultimate goal. The goal of this QI project is to improve DR screening rates by 10% in a PCP's practice over a two-month timeframe from project implementation. Short-term and mid-term outcomes identified by the QI team are: 100% of diabetes mellitus (DM) patients receive intervention paperwork when checking in for PCP visit, 100% of DM patients return paperwork during their PCP visit, 100% of DM ophthalmologist notes or ophthalmologist scheduled dates received within one month, and 100% of DM ophthalmologist visit dates entered into EMR within one month of visit. The logic model in Appendix A addresses the specifics of project goals.

Context

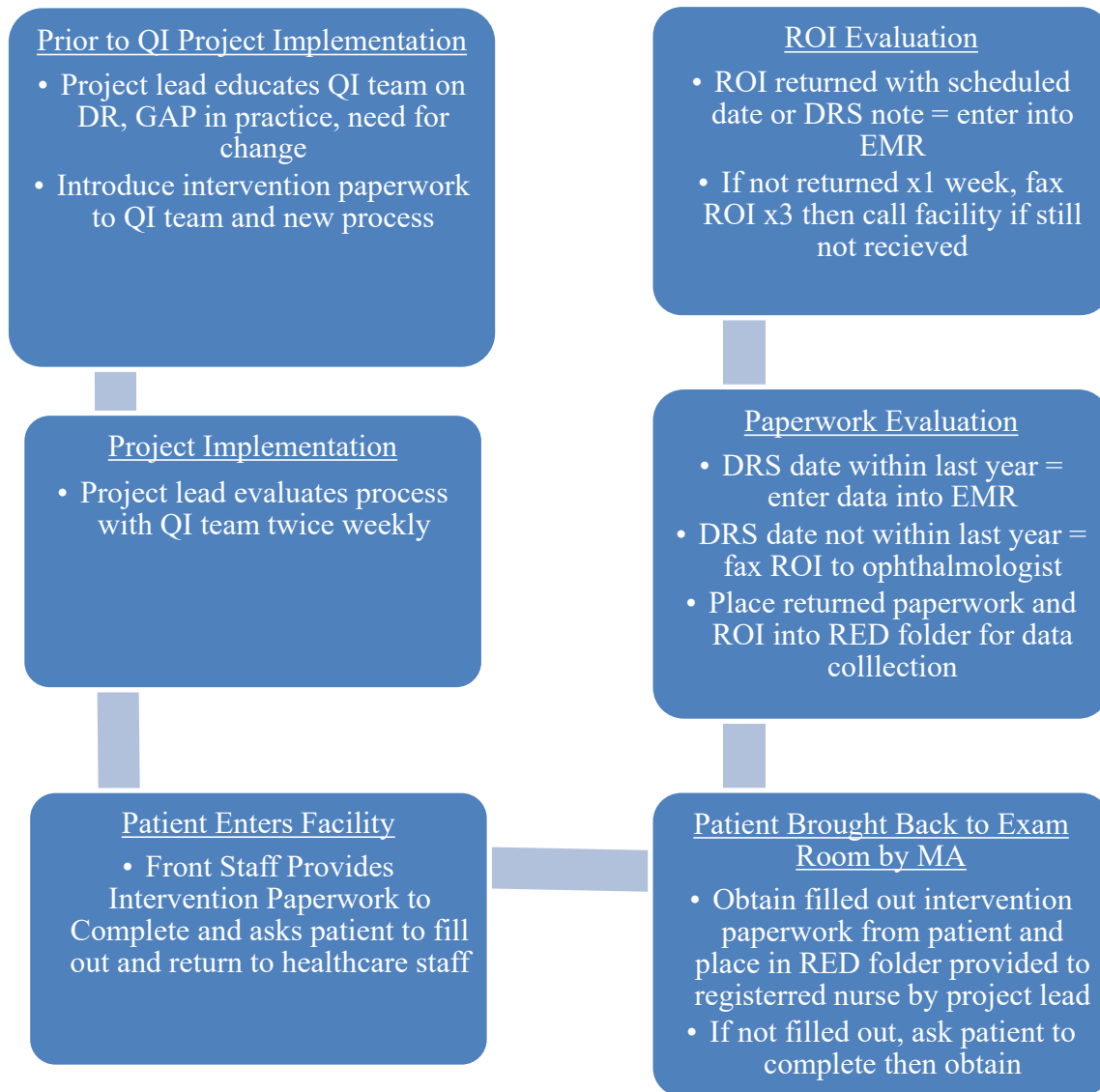
The site provided its practice size, location, practice type, practice setting, and target population numbers. The site was selected for its practice setting, practice type, diversity in patient populations, and target population size. The site was selected because it is the largest outpatient PCP office in a city in Western Montana. The larger patient population allows the intervention to be trialed on more target individuals: diabetics. The larger population allows for more diverse patients to be assessed well. In the selected site, a physician leads a team with an advanced practice provider (physician's assistant), a registered nurse, a care manager, a medical assistant, and two front staff employees. The practice is located in an urban city in Montana, with the practice having around 1600+. The practice serves 160+, 18 or older patients with DM. Current procedures for DR screening follow-up involve the physician or PA asking the patient at their DM visit if they have had their annual DR screening exam. Then, the provider either manually enters the date into the EMR or asks the patient to complete their recommended annual screen. The patient is then responsible for scheduling their eye exam and returning the information to their PCPs office to update their EMR screening date.

Intervention and Implementation

An intervention will be implemented to improve DR screening rates and their associated complications. All of the healthcare staff is educated by the project lead about current DR screening rates, education about DR, and the need for improvement. A patient handout created by the project lead in collaboration with the healthcare staff included two questions: When was the date of your last diabetic retinopathy screening exam? Who conducted your last diabetic

retinopathy screening exam? The front staff was trained on the new handout and educated to provide this to DM patients when checking in for their appointment. Healthcare staff (which includes physician, physician's assistant, medical assistant, and registered nurse) is trained on new paperwork and processes. The intervention paperwork is filled out by the patient, and then the healthcare staff collects the paperwork; if not filled out, the patient should be reminded to complete and then it is collected by the healthcare staff. Based on the answers to the handout questions, healthcare staff (registered nurse, medical assistant, front staff) either faxes a request for information (ROI) to the facility that conducted their last eye exam, or faxes a request for an appointment for the patient. The faxes are kept with the patient's intervention paperwork handout in the folder provided to the registered nurse by the project lead. Once ophthalmologist DM visit notes are received, the registered nurse or medical assistant enters the information into the EMR. This project is to be implemented over a three-month timeframe with the goal of improving DR screening rates by 10%. Below is a visual of the process flowsheet of the QI project implementation.

Figure 3. Proposed Intervention Flowsheet



Anticipated barriers or challenges include incompleteness of handouts, lost handouts, failure to hand out paperwork to DM patients, failure to record data, and failure to receive fax back from external offices. The following table lists the barriers and strategies to overcome them.

Table 1. Potential Intervention Barriers & Strategies

Barrier	Strategy to Overcome
Incompletion of Handout	• Front staff will ask the patient to fill the handout out while checking in for visit • Healthcare staff will ask about paperwork completion and remind to complete
Lost Handout	• Registered nurse provided a RED colored folder by the project lead to collect hard copy paperwork, prior to data entry into Excel by project lead
Failure to Handout Paperwork	• Healthcare staff reminds front staff during morning huddle about DM patient needing new DM paperwork.
Failure to Record Data	• Responsibility of project lead to record data in Excel spreadsheet. • Registered nurse already trained on EMR utilization for entering date of DR screen visit
Failure to Receive return Fax from external office	• X3 attempts once per week faxing ROI by the registered nurse, followed by phone call to facility.

Financial considerations are minimal in this project, although educational/time considerations should be taken into account. Also, the paper required to create the handout is another cost expenditure.

Evaluation

For SMART goals 1 and 2, the QI team conducts process evaluation twice weekly, led by the project lead. The QI team pulls data from the previous weeks from the EMR on the number

of DM visits and the number of intervention handouts returned and filled out. Data is entered into an Excel spreadsheet by the project lead on his computer, free from any patient identifiers. The Excel spreadsheet will not include the patient's name, DOB, or demographic information. The patients' information (intervention handout, faxes, ophthalmologist notes) with identifiers will be kept at the QI site. The patient's information will be correlated with a six-digit number between 100,000 and 199,999, created from a random number generator. The connection of the number and patient information is secured on a Word document at the clinical site in their secured hard drive. For SMART goal #3, the returned patient handouts are attached to the ROIs that were faxed. This data is then documented in Excel by the project lead during his twice weekly site visit. This documentation allows the QI team to assess the process of requesting information. The researchers will either continue the new process as is or change the process to ensure more accuracy in the process. In SMART goal #4, the ROI is received with either a scheduled visit time or DM note. The DM note and/or scheduled visit times are kept in the folder by the registered nurse with the handout. This data is transferred to the Excel spreadsheet by the project lead during one of the twice weekly site visits. The QI team evaluates this data documentation to further evaluate the new process. The overall outcome of the intervention will be determined before implementation of DR screening rate percentage compared to after project implementation DR screening rate percentage. The ultimate goal is to increase the screening percentage by 10% over a three-month time period. Table 2 below describes strategies, data to be collected, methods of collection and responsible parties, and planned data analysis in each SMART goal.

Table 2. SMART Goals

SMART Goal #1: 100% of DM patients will receive intervention paperwork while checking in for office visit. SMART Goal #2: 100% of DM patients will fill out intervention paperwork and return it to healthcare staff during visit. These goals are set at 100% as staff is educated about the new process prior to implementation and healthcare staff reminds front staff during huddle each morning to provide paperwork to appropriate patients. Front staff and healthcare staff will double check for patients to fill out paperwork and return it.		
Description of strategies • Project lead will educate the front staff about the new process and handout paperwork during a meeting with the QI team, prior to project implementation. ○ Will need two question handout intervention paperwork. ○ Will need new process workflow table. • Healthcare staff reminds front staff during morning huddle of which patients receive the new DM paperwork process. • Project lead creates a folder that is kept by the registered nurse labeled “QI Completed Handouts” ○ The folder will hold all of the hard copy material with patient identifiers and be kept secure at the clinical site by the registered nurses. ○ Hard copy materials will be shredded in the facilities’ securely locked shred bins following data transfer.		
Data to be collected	Method of Collection and who is responsible	Planned data analysis
Number of DM patients	Nurse will run EHR report that captures the number of DM visits conducted each week	Twice weekly the project lead will evaluate how many DM patient visits were conducted vs. how many intervention handouts were returned. Also comparing how many are filled out vs. not filled out, and completed annual eye exam vs. not completed
Number of DM intervention handouts returned (either blank or filled out).	Medical Assistant & Nurse – place handout in provided folder.	

Table 2 Continued

SMART Goal #3: Healthcare staff will fax ROI to ophthalmologists for 100% of DM patients who have not completed their annual DR screening within 1 week of DM patient office visit. This goal is set at 100% as the project lead educated staff about the new process and needing to complete the ROI process.		
Description of strategies - Project lead will develop an Excel spreadsheet for data collection of the following: filled out intervention paperwork, completed annual DR screen or not, and documentation (Y/N) of ROI fax to ophthalmologist with date faxed included. Data is collected twice weekly by project lead. - The registered nurse will keep all hard copies of ROI with intervention paperwork received. - Once the data is transferred into the Excel spreadsheet by the project lead the hard copies can be shredded in the facilities securely locked shred bins.		
Data to be Collected	Method of Collection and who is responsible	Planned data analysis
Number of annual DR screenings NOT completed Number of ROIs faxed	Nurse – after faxing, keep ROI with returned intervention paperwork in provided folder	Project lead to compare the number of returned intervention handouts that have not completed their annual DR screening eye exam to ROIs faxed
SMART Goal #4: 100% of ophthalmologists DM visit notes or scheduled appointment date received within 1 month of DM patient office visit. Receiving 100% of ophthalmologist notes or appointment dates ensures that the projects process is completed understood. However, this goal has the greatest barrier as we rely on the external facility faxing back information. The barrier-strategy table included above describes strategies to combat this.		

Table 2 Continued

Description of strategies - Returned ophthalmologist paperwork kept in provided folder with ROI and intervention paperwork by the registered nurse. - Project lead then documents Y/N paperwork received along with date received into the Excel spreadsheet during one of the twice weekly site visit.		
Data to be Collected	Method of Collection and who is responsible	Planned data analysis
Number of ophthalmologists notes or appointment dates received, date received	Nurse, medical assistant – copy returned ROI information and place in provided folder	Compare number of ROIs faxed to that of received ophthalmologist notes and appointment dates
SMART Goal #5: 100% of patient ophthalmologist DM visit dates will be entered into EMR within 1 month of DM patient office visit. This goal is set at 100% as it is a task that staff is already educated on how to do but will need to ensure that they complete the task for this QI project validity and reliability.		
Description of strategies - Requires ophthalmologists to fax back requested information - After healthcare staff has made x3 fax attempts for ROI, the registered nurse will make a phone call to the ophthalmologist office requesting for information. - Will require nurse or medical assistant to enter these into EMR		
Data to be collected	Method of Collection and who is responsible	Planned data analysis
Number of ophthalmologist notes returned	Nurse, medical assistant – copy placed in provided folder and Excel documentation	Compare number of returned ophthalmologist notes to that of ophthalmologist notes entered

Table 2 Continued

Number of ophthalmologist notes entered into EMR	Nurse will run EMR report that captures entered EMR documentation	
SMART Goal #6: Diabetic retinopathy screening percentages will improve by 10% in one PCP's office within 3 months from project implementation.		
Description of strategies		
- Follow-up with healthcare staff twice weekly on new process and discuss improvement ideas - Project lead to continue to observe/assess/evaluate the new process implementation, accurately collect data and document in Excel		
Data to be collected	Method of Collection and who is responsible	Planned data analysis
Percentage of DR screening rates prior to project implementation	Nurse is to pull prior to intervention DR screening rates	Analysis of the DR screening percentages before and after implementation will be compared by the project lead
Percentage of DR screening rates 3 months after project implementation	Nurse to pull DR screening percentage 3 months after QI project implementation	

CHAPTER THREE

IMPROVING DIABETIC RETINOPATHY SCREENING: QI MANUSCRIPT

Background

DM and its associated complications are a growing concern in healthcare, affecting 1 out of every 10 Americans or approximately 37.3 million individuals (CDC, 2021). DR is the most frequent complication of type 1 and 2 diabetes, impacting roughly 1/3 of all diabetic populations worldwide (Kusuhara et al., 2018; Simo-Servat et al., 2019). A national survey showed that 73% of adults with DR were unaware of the condition, or its' severity (Skaggs et al., 2017).

DR is a microvascular complication of diabetes, most commonly due to poor glycemic control. The capillaries within the retina cannot sustain homeostasis with elevated blood sugars over a prolonged period, and this gradually progresses to retinal damage that leads to permanent visual field changes (Buffolino & Park, 2019). DR is the leading cause of blindness in the working-age population (Buffolino & Park, 2019), and, the annual costs associated with DR in the US are \$6.2 billion (Liu & Swearingen, 2017). Blindness associated with DR is up to 90% preventable, with early recognition in the disease process with annual screening DR eye exams. However, nearly 50% of individuals with DR fail to follow the current recommended guidelines (Liu & Swearingen, 2017). Increasing diabetic retinopathy screening (DRS) rates is a priority in today's healthcare field, aiding in the reduction of healthcare costs and preventing disease progression to blindness in a growing diabetic population.

Problem Description

Annual screening for DR is recommended for both type 1 and type 2 diabetics per the American Academy of Ophthalmology's Diabetic Retinopathy Preferred Practice Pattern (Flaxel et al., 2019). Even with the knowledge of potential progression to permanent blindness, the general population of diabetics within the US fails to complete annual preventive screening for DR. The current local and national recommendation for DRS in primary care is screening for 80% or greater of all diabetic patients. On average, the literature states that current US DRS rates vary from 55–63% (Lu & Serpas et al., 2016). With clear standards of care established, there is still a 20–30% gap in DR preventive screening. The low DRS rates call for primary care interventions to decrease the gap in the standard of –care.

Specific Aim

This project aims to develop, implement, and evaluate a questionnaire for PCPs to implement at diabetes follow-up appointments in an effort to improve DRS rates and prevent the progression of DR to blindness. DR is a quality indicator for managing diabetes. Improving DRS rates will move primary care providers closer to the ultimate goal: a reduction in the number of patients afflicted with visual loss and blindness. The overarching goal of this QI project is to improve DRS rates by 10% in a PCPs practice over a two-month timeframe.

Literature Synthesis

There is a need for DRS in primary care as shown by the growing diabetic population and gap in DRS rates. The literature describes difficulties surrounding the complexity of patients,

individual clinics, resources available, patient involvement, and healthcare staff endorsement when attempting to create an intervention for DRS (Riordan et al., 2020). The literature describes that PCPs offices are an ideal location for the implementation of an intervention to improve DRS. The PCP office has the potential to maximize DRS enablers: rapport, patient education, standardized reminder, and limit barriers. There has not been a single identified intervention within the literature to address DRS due to the surrounding complexity. However, Lawrenson et al., (2018) found that any DRS intervention applied to practice increased rates by 12% compared to the status quo. With this knowledge, creation, and implementation of an intervention can be individualized to each unique healthcare facility as long as the intervention addresses enabling factors, and reduces barriers identified in the literature.

Rationale

The conceptual model used for this project was the SEIPS 3.0 model (Holden & Carayon, 2021). This model allows for the examination of the patient journey within a healthcare system and influences along that journey that attribute to patient safety and outcomes (person, environment, tasks, technologies, and tools). The SEIPS model has been used to specifically look at barriers and enablers of a process within a work system (Holden & Carayon, 2021).

Methods

Context

The QI site is an outpatient PCP office that is part of a larger medical group in central Montana. The medical group provides primary care for more than 28,000 diverse individuals; over 2,000 of these individuals have been diagnosed with diabetes. The office for this project

serves roughly 1,600+ patients with a wide variety of health illnesses, including 160+ diabetic patients. Participants for the project were adults aged 18+ with DM 1 and 2.

The QI site was selected as it is the largest outpatient PCP office in a western rural city in Montana state. The clinical staff includes two providers, a registered nurse (RN), and two certified medical assistants (CMAs). A high turnover rate of RNs and CMAs in this practice as reported by the site representative makes standardizing processes more difficult to uphold. Currently, the whole medical group has an average DRS rate that coincides with national rates for DRS rates at 56%, and the clinic chosen for the project has a 61% DRS rate. The recommended goal from the national and the medical group is 80% or greater. This project will address this practice gap.

For every DM visit, the staff is expected to address four diabetes control indicators with a hemoglobin A1c (HgbA1C), annual DRS eye exam, annual foot exam, and annual kidney function testing. All indicators, except for the annual DRS eye exam, were conducted at the PCP's office. The DRS eye exams are conducted by one of three ophthalmologists in town; reports are faxed back to the PCP's office.

Currently, providers ask patients during their annual DM visit if they have had an annual DRS exam. Then, providers either manually enter the date into the EMR or ask the patient to complete their recommended annual screen. The patient is then responsible for scheduling their eye exam and returning the information to their PCPs, who would update their DRS date within the EMR.

The 20–30% gap in DRS allows for continued progression to blindness for a growing population of patients with DM. The proposed intervention has the potential to benefit a

significant number of DM patients seen by providers at this Montana facility. The project will be implemented over a three-month span, starting from educating the healthcare staff on the new process, through to the evaluation phase. The implementation phase will be ten weeks long. Members at the QI site have all been involved in prior QI initiatives and are familiar with the framework chosen for the project. The QI site has software that allows data extraction from the EMR to identify current DRS rates within the practice. This software will be used to evaluate screening rates before and after intervention implementation.

Intervention

A GAP analysis was conducted at the QI site regarding DRS (Figure 4). The analysis identified a consistent gap in DRS rates compared to best-practice recommendations. In order to close this gap, the project lead and healthcare providers developed a DRS questionnaire for DM patients (Figure 5) and implemented a new DRS process during every diabetic appointment in the office. Application of a journey map (Chapter 2, Figure 2) using the SEIPS model during a diabetic patient visit assisted in intervention development by allowing the project lead and QI site healthcare providers to identify DRS barriers and enablers.

Figure 4. GAP Analysis

GAP Analysis			
Problem Low DRS Rate: 61%	Current Situation National and Local Standards for DRS Rate set at $\geq 80\%$	Desired Outcome Improve DRS Rate within PCP, Reduce risk for Blindness	GAP ~ 19%
Actions/Requirements • Reduce DRS Patient & Healthcare Provider Barriers. • Improve and standardize DRS process. • Improve EMR Documentation of DRS dates. • Improve Care Coordination.			

The main barriers identified from the journey map included patient education/competence, patient time/scheduling constraints, care coordination with eye providers, chart auditing, workload/time constraints, and updating EMR. By identifying barriers within the environment, tasks, technologies, and tools affecting the DRS process during a diabetic patient visit, we were able to collaboratively develop a systematic interventional plan during diabetic appointments. The intervention was designed to address the facility's gap in DRS rates, integrate smoothly into the workflow, eliminate identified barriers, and increase enablers for DRS. The questionnaire and new process were similar to their established screening process, to eliminate some resistance barriers but adjusted to incorporate the best evidence found in the literature. The site representative was open to trialing a new process to improve DRS rates. All healthcare workers at the QI site were informed individually of current practice DRS rates, DRS guidelines, intervention questionnaires, and new processes associated with diabetic visits. Follow-up education and training were provided at biweekly QI site visits by the project lead as needed to the healthcare providers.

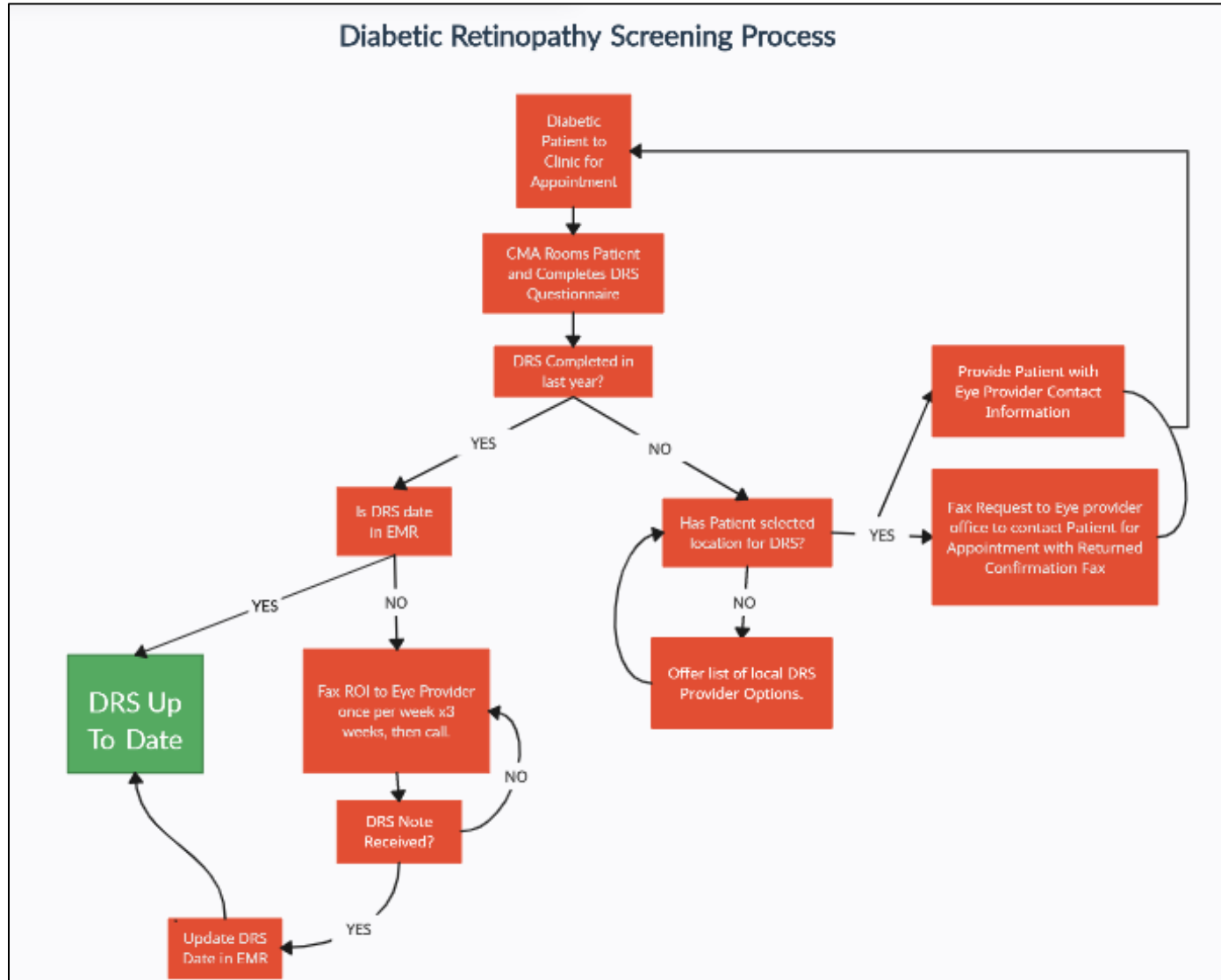
The DRS questionnaire (Figure 5) had two simple questions to initiate the DRS process: When was your last diabetic retinopathy exam? And where did you complete your last DR eye exam? Initially, the team thought the questionnaire would be provided to patients when checking in by the front staff and collected once completed by the CMA or provider during the visit. However, during initial implementation, the healthcare providers and project lead streamlined the process. The process was streamlined by having the CMAs ask the questions on intake and fill them out for the patient. This action eliminated extra steps and potential barriers to questionnaire incompleteness or failure to collect. The filled-out questionnaire was then placed in a

yellow folder that was kept by the CMA and RN in a secure locked filing cabinet at the QI site. The answers to the questionnaire started with the newly developed DRS process. The new DRS process (Figure 5) begins with the completed questionnaire. The process was easy to follow, based on the answers provided by the patient. The CMA and RN followed the new process pathway provided by the project lead. The remainder of the questionnaire prompted the patient and the provider to undergo education about DR and current guidelines during the in-office visit.

Figure 5. DRS Questionnaire

Diabetic Retinopathy Questionnaire	
1. When was the date of your last Diabetic retinopathy, eye exam?	
2. Who conducted your last Diabetic retinopathy, eye exam?	

Figure 6. DRS Process



Intervention Evaluation

The QI project used a quantitative improvement design, with the main outcome of interest being the practice's DRS rates. Other project control indicators that were measured included the number of DM patients who had the DR questionnaire completed during their visit, number of annual DRS's completed at time of visit, number of DRS's not completed at time of visit, percentage of request of information's (ROIs) faxed, number of DRS notes received from ophthalmologists' offices, and number of DRS dates updated in EMR.

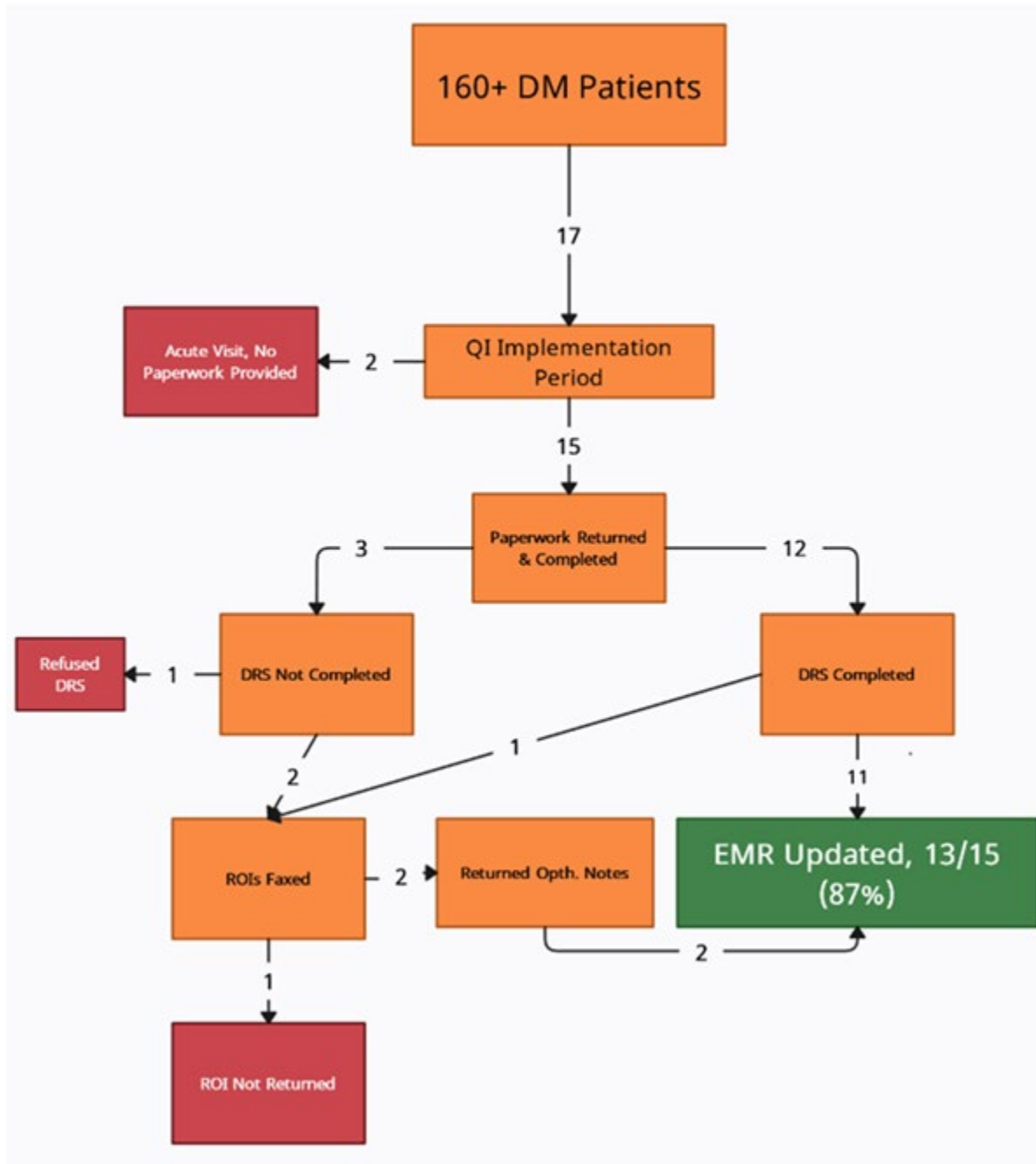
To measure the impact of the intervention on patients, a control "Shewhart" chart (Figure 7) was created to show normal variations in the DRS rates at the time of implementation one year prior to intervention implementation. The control chart allows researchers to differentiate between common-cause variation and/or special-cause variation that can be attributed to the QI intervention (Portela, et al., 2015).

Results

Pre-intervention implementation DRS rate at the QI site was 61%. The practice serves 1600+ patients with 160+ being adults with DM. Over the seven weeks of data collection during the QI intervention implementation period, 17 DM patient charts were reviewed. Of these, 15 (88%) who were for DM visits received the intervention paperwork, with a 100% questionnaire completion rate. The two DM patients who did not receive intervention paperwork were there for non-DM associated visits. Among the 15 screened, 3 patients (20%) had not completed their annual DRS, and 12 (80%) reported completing their annual DRS exam.-Eleven of the 12 (92%) patients' records were updated in the EMR with current ophthalmology notes. One ROI was

faxed for a patient whose EMR was not updated due to an unknown date of annual DRS completion without a current ophthalmology note in the EMR. Two ROIs were faxed for two of the three patients who reported not completing their annual DRS; one patient refused DRS screening. There were two returned ROIs with ophthalmology notes that had DRS dates that were then entered into the EMR. At the conclusion of the study, one ophthalmology note was missing, and one patient refused DRS. In total, 87% of diabetic patients who received the DRS intervention paperwork (13 out of 15 patients) had their DRS data entered into the EMR. At the completion of the project, the total DRS rate at the PCPs office was 74%, a 13% increase in DRS rates from pre-intervention to post-implementation in seven weeks. Figure 6 helps visualize the data collection.

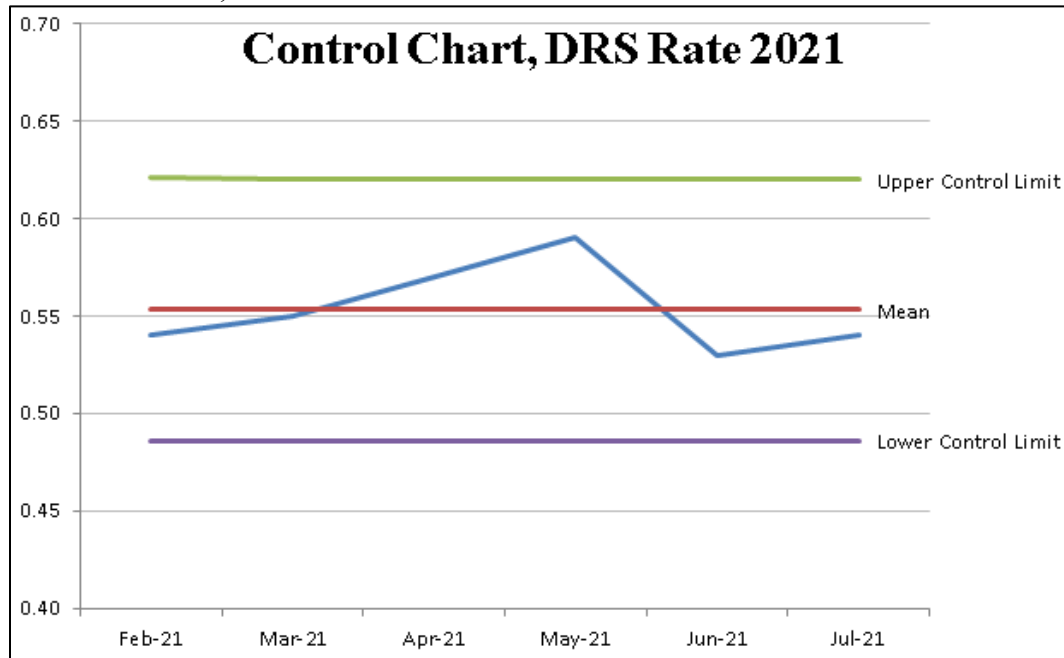
Figure 7. Data Flow Chart

Implementation Flow Chart

Discussion

There was a 13% increase in diabetic screening rates at the QI site from pre-intervention to post-intervention, which was seven weeks long. The control chart (Figure 8), was used to test if the intervention was responsible for the 13% increase based on the standard variation of DRS rates over a six month period in 2021. The control chart indicated standard variation to be around 7%. This indicates that the intervention was responsible for a 6% increase in DRS rates outside of normal variation. This 6–13% increase in DRS rates is similar to the meta-analysis findings by Lawrenson et al., (2018), who reported that any intervention compared to the status quo will increase DRS rates by 12%, especially incorporating behavioral change techniques. The results of this study indicate that the QI intervention can improve DRS rates in primary care. Improving the DRS rates will assist in the early recognition of DR and the prevention of blindness among diabetic patients. Improving DRS rates will improve patient care and reduce DR healthcare costs. Key to the success of this project was the collaborative creation of the interventions, keeping in mind the resources and current practice processes/workflows of the QI site.

Figure 8. Control Chart, DRS 2021



Discussions with the healthcare providers at the conclusion of the implementation period led the project lead to believe that this intervention was simple and easy to implement. However, the healthcare providers stated that they are unlikely to sustain the newly developed DRS intervention and process, noting that the previous DRS process was easier to use. Further projects are needed in order to address the resistance to change barriers and diffusion of innovations. Future projects could implement a resistance to change (RTC) scale prior to intervention implementation to evaluate who may resist the change and why (Kouri et al., 2020). Another tool that future projects can apply is the Rogers' Diffusion of Innovations Theory (DIT) to combat resistance to innovative changes. The premise of using DIT is to better understand the factors that interfere with the acceptance or non-acceptance of an innovation (Magalhaes Silva et al., 2022). Applying tools like the RTC scale and DIT in future projects could allow change

agents to better address potential barriers, allowing for better sustainability of their proposed QI project.

With minimal implementation costs of this project, there is a large upside. Costs incurred for the implementation of this new process include, educating staff, materials for the questionnaire, and staff time coordinating care and documenting. The project lead provided the collaboratively developed questionnaire to the clinical site. The financial upside to improving DRS rates is in financial reimbursement by improving Centers for Medicare and Medicaid (CMS) established quality measures (2022). DRS is reimbursed under the CMS value-based program, in which PCPs and ophthalmologists split the reimbursement and the Medical Group Management Association (MGMA) (2022) found to be 6.74% of the total revenue at primary care. MGMA goes on to estimate that this is about \$31,000 per provider. With annual DR costs currently \$6.2 billion and climbing, early recognition, and prevention is critical in healthcare cost reduction for patients and improvement in their quality of life.

Another finding worth to shed light on is a patient out of 15 DM visit patients, who refused to DRS. As literature stated, denial and fear are DRS patient barriers. The questionnaire was used as a trigger for a PCP and a patient to discuss annual DRS preventive interventions, but the project did not investigate the content of their discussion. Since this project clinic has 160+ DM patients, there is possibility that about 10 patients may refuse if such the ratio can count.

Limitations

This QI project had several limitations. The QI site serves predominantly working-class, Caucasian patients making the applicability of these results limited. A small DM population (n=17) presented to the clinic during the intervention implementation period; a larger population

size would improve this study. Our project was also not longitudinal, rather, it was a seven-week timeframe for project implementation. A longer timeframe would allow for more data collection and PDSA (Plan, Do, Study, Act) cycles would have allowed for intervention improvement and a higher graded assessment of intervention validity.

Since the collaboration started smoothly the project did not evaluate perceptions of RTC and DIT systematically throughout the project implementation, which would have revealed additional valuable information. Additionally, this project was conducted at a facility that had staff who had been involved in QI projects in the past, and had software developed to pull DRS rates quickly, removing the need for chart auditing. The DRS intervention proposed in this QI project relied heavily on the efforts of the nursing staff. Addressing the workload concerns of the nursing staff will elicit better preventive care coordination, which includes DRS. For example, setting up a DRS-update process (i.e. entering dates of completion or scheduling) into the EMR system instead of the paper handling might have attracted the site adaption.

Conclusions

Action is needed to address the national gap in DRS, growing healthcare costs, and the progression of DR to blindness in the working-age DM population. This QI project attempted to address the gap in DRS rate at a PCP office. Our findings indicate that an intervention applied at DM patient visits within primary care can close the DRS gap. Our findings have financial implications for both the patient and healthcare organization along with maintaining, the visual quality of life of DM patients.

The large workload that PCP offices perform daily can drown out the necessity and importance of DRS. The literature also shows that a lack of patient education surrounding DRS

is a main driving force for low DRS rates. The questionnaire acted as a useful reminder for DM patients and healthcare providers to discuss their annual DRS preventive interventions.

The sustainability of a DRS intervention is largely dependent on the behaviors and attitudes of the healthcare staff. Future projects could implement the RTC or DIT to account for these variables. A longitudinal QI initiative would also assist in combatting the resistance to change. The complex nature of the multifaceted barriers associated with DRS complicates the standardization of DR preventive care. Developing locally fit strategies collaboratively within a PCP clinic is the key to close the DRS standard of care gap. However, this project found further strategies are needed to overcome barriers and enhance enablers at an individual level from both healthcare providers and DM patients. Planning QI projects should continue improve patient care by reducing barriers and improving facilitators.

CHAPTER FOUR

DNP ESSENTIALS REFLECTION

DNP Essential #1

Doctor of Nursing Practice (DNP) essential #1 is Scientific Underpinnings for Practice. This is defined as synthesized and applied nursing science rich in evidence-based practice (EBP) that systematically uses EBP theories and concepts and evaluates outcomes. Additionally essential #1 covers the development and evaluation of new practice approaches or applications with rationale. The class that comes to mind that covers all of these aspects is advanced pathophysiology.

Advanced pathophysiology was a great class for delving deep into the evidence-based scientific literature to define and discuss disease processes. The research into disease processes did not stop at the biophysical level. The case studies and discussions with peers delved deep into the psychosocial, analytical, and ethical realm as well when discussing patient preference on treatment and certain patient populations more prone to specific disease processes. The case studies covered the many areas of possible disease process a graduated DNP would see in practice. During these EBP discussions, the rationale for new approaches/applications to treatment regimens was discussed and applied. During this class, the PDSA method was used even though students did not know they were doing so. The case study would be presented, and students would have to answer questions directly correlated to the case. The plan method was implemented when the case study was designed and presented. The do method was implemented during the reading/interactive phase of the case study where students would collect data on the

case study patient. The study method was then performed by the students answering the questions and the act phase of the PDSA method was conducted during the EBP discussion among peers about what to do next for this patient. The numerous case studies engaged students in the PDSA method via interactive EBP discussion, achieving the definition of DNP essential #1.

DNP Essential #2

Doctor of Nursing Practice (DNP) essential #2 is Organizational and Systems Leadership. DNP essential #2 is met when the student has developed and evaluated care delivery to meet present and future patient needs via EBP methods. Additionally, the student must ensure accountability for the quality and safety of the population of patients they work with, and developed, led, and evaluated strategies for managing dilemmas found within healthcare. A couple of classes that I have taken come to mind for this essential and they are advanced nursing leadership and roles, and vulnerability and healthcare in diverse communities.

The exemplar that meets the first aspect of DNP essential #2 was in finance and budgeting healthcare systems. The first paper/project was to find a current law/policy that challenges the provision of healthcare for a practicing FNP and develop EBP methods for overcoming this challenge. Completing this assignment required the development and evaluation of a plan to overcome the healthcare challenge to improve patient care. Through EBP research, I was able to recommend and disseminate the knowledge to my classmates via discussions. This assignment inherently incorporated organizational, political, and economic science as the EBP research coupled current law/policy with improving healthcare. The assignment also allowed peers to evaluate the recommendation of the plan and critique it toward a polished project. This

project innately covers the aspect of DNP essential #2 of ensuring accountability and safety of the patient by implementing an improvement in a problem/challenge for the betterment of healthcare for patients. The class vulnerability and healthcare in diverse communities also crushed this aspect of DNP #2. This class exemplar was a group project where there was a defined community where vulnerabilities and a vulnerable population within that community were identified. It was the students' job to then create EBP recommendations to address and improve these vulnerabilities. This knowledge was then disseminated to peers via presentation, which was followed by a peer discussion. Through the EBP research of this project, dilemmas within healthcare were found and discussed with the class as a whole. EBP posts for improvement or how to address these dilemmas were conducted. The discussions led to solutions proposed to improve patient care. I have completed the CITI certification and will attach the certification in the "Additional Document" section of the box. With the completion of these classes and their associated exemplars, I have completed the necessary criteria that define DNP essential #2.

DNP Essential #3

Doctor of Nursing Practice (DNP) essential #3 is Clinical Scholarship and Analytical Methods for Evidence-Based Practice. This is defined as analytic methods used to critically appraise existing literature and other evidence to determine and implement the best evidence for practice. Statistical applications and evidence-based practice two are a couple of courses that helped meet DNP essential #3.

The statistical application was a great class for understanding the statistical analytical tools being used when research was conducted. These tools are used to determine statistical

significance. This does not always cross over into clinical significance, but it is a good reference to use when determining whether a research article is accurate/appropriate for use in practice. Through learning the different tools via lectures and exams in this class, I was able to take this with me to use on evidence-based two assignments. In evidence-based two, we were required to do rapid critical analysis (RCA) of qualitative and quantitative articles in both integrated and allopathic fields. This helped hone the skill to quickly determine whether a journal article could appropriately be implemented into practice. In this class, we used this RCA skill in our group project. This involved searching a multitude of databases for journal articles that could be used in our PICOT research presentation. Once we found articles, we then used the RCA skill to determine which ones were relevant to our research. Along with this, we used an Agree II tool to evaluate and appraise a guideline and determine whether this guideline is appropriate for implementation into practice. All of this was summed up in a final presentation of our research and the guidelines. At the end, we proposed our recommendations for practice based on the analysis of our literature review and AGREE II guideline review. These two classes and exemplars helped me meet the DNP essential #3 criteria.

DNP Essential #4

Doctor of Nursing Practice (DNP) #4 is Technology for the Improvement and Transformation of Healthcare. DNP essential #4 is defined by five criteria: 1. Designed, selected, used, and evaluated innovative programs. 2. Created, analyzed, and communicated critical elements. 3. Demonstrated advanced conceptual ability and technical skills. 4. Provided high-impact leadership in the evaluation and resolution of ethical and legal issues. 5. Evaluated consumer health information sources for accuracy, timeliness, and appropriateness and applied

information to practice. There is one class that covered all of this criteria and that was nursing informatics.

The nursing informatics course did a superb job at getting peer-to-peer discussion going in the aspect of technology and healthcare. The class exemplar that I want to talk about that addresses all aspects of DNP essential #4 was the final project for the course. The final project was an accumulation of multiple projects throughout the course. The final project was a PowerPoint presentation of a technology that can be implemented into practice to improve outcomes for patients. To do this, students engaged in EBP research of both the technology and specific patient populations. Discussions with peers helped polish the project to its final nature. The project allowed students to select an innovative program, gather data on this program, and present it to their peers. Doing this project showed innovation, initiative, technological skills, and intuition from the student to create the final project. The project needed to be something that would provide high impact; because of this, evaluation was key. The legal and ethical considerations of the product were taken into account and explained during the presentation. The product needed to be one that would be something feasible for patients to use and provide accurate, timely information to providers to help improve patient care. The nursing informatics project helped me understand the importance of nursing informatics and helped me complete the necessary criteria outlined by DNP essential #4.

DNP Essential #5

Doctor of Nursing Practice (DNP) essential #5 is Care Policy for Advocacy in Health Care. This essential is defined by seven criteria: Critically analyze health policy proposals, policies, and issues. 2. Initiated leadership and managed the development and implementation of

policy. 3. Influenced policy makers. 4. Influenced others through education. 5. Advocated for the nursing profession. 6. Evaluated, transformed, and provided leadership for healthcare policy. 7. Provided leadership to address social justice and ethical policies. The class that I took that covered all of the criteria above was Ethics, Law, and Policy for Advocacy in Healthcare. The specific assignment in Ethics that comes to mind for this essential was a research topic that we conducted a literature review and paper for. After researching the topic, we then found a recent healthcare policy that we proposed an addendum to, writing a letter to the governor advocating for a policy change. Throughout this assignment, we learned the tools necessary to address current healthcare issues and advocate for them through a professional and political avenue. The letter included educational and statistical information to make our point, and the data used was found in the literature review. This assignment embodies DNP essential #5 in its entirety.

DNP Essential #6

Doctor of Nursing Practice (DNP) essential #6 is Interprofessional Collaboration for Improving Patient and Population Health Outcomes. This is defined as effective leadership skills coupled with communication and collaborative skills in the development and implementation of scholarly projects within a complex healthcare delivery system. The class that met this defined criteria was Health System Designs.

In this class, I was mixed in with engineering students. Throughout the semester, we collaborated in detailed weekly discussion posts designed as learning circles. This design of a class was excellent as it warranted collaboration between nursing and engineering students. Each had the expertise to bring to the table. When needed, I would take a leadership role in defining nursing processes and share my knowledge with the engineering students. This collaboration

allowed for an exchange of knowledge before submitting the final product of each learning circle. This made for an outstanding final product as the best of both worlds were represented.

The final learning circle was an A3 report, which was a summation of all the prior learning circles. It was built around an issue that was identified in the observation of a complex healthcare delivery system that needed improvement. Through this learning circle, a rough draft was submitted, and the peer group collaborated to assist each other in improving the final draft of the A3 report. This final scholarly project used a multitude of tools. It used process mapping, fishbone diagram, root cause analysis, and follow-up/recommendations. This exemplar is a great representation of how I have achieved DNP essential #6.

DNP Essential #7

Doctor of Nursing Practice (DNP) essential #7 is Clinical Prevention and Population Health for Improving the Nation's Health. This is defined as analyzing and synthesizing appropriate scientific data related to individual, aggregate, and population health. This data is then used to evaluate delivery care models in a multidimensional approach to health. There have been two classes in the DNP program thus far that have had projects that exemplify and meet this essential. Evidence-based practices 1 & 2 met the standards of DNP essential #7.

Evidence-based practice one and two had end-of-the-semester projects that were both aimed at preventive healthcare. We collected and appraised both allopathic and integrative evidence that helped define the individual perspective of our community/population perspective in regard to the PICOT question we formulated. We collected this data from reputable sources to garner bio-statistical information that would help expound the defined problem. After analyzing the evidence and scientific data obtained from our research, we synthesized all of the

multidimensional clinical data into a paper and presentation. This paper and presentation looked at the gaps in healthcare delivery models and strategies that are missing for the defined populations. We aimed to implement interventions to address this gap in clinical prevention with an aim to improve health promotion. These projects helped me meet DNP essential #7 by making me comfortable with analyzing scientific data from a multitude of areas. This project also had an emphasis on preventive healthcare for a specific population, which can be seen in the name of DNP essential #7.

DNP Essential #8

Doctor of Nursing Practice (DNP) essential #8 is Advanced Nursing Practice. Essential #8 is met with the following criteria: conducted a comprehensive and systematic assessment; designed, implemented, and evaluated interventions; developed and sustained therapeutic relationships with patients and other professionals; implemented advanced levels of judgement, thinking, designing, delivering, and evaluating evidence-based care; led or implemented initiatives; facilitated, educated, and guided individuals/groups through complex health situations; and used conceptual and analytical skills to impact and evaluate practice, organizational, population, fiscal, and policy issues. All of these elements are met throughout the 675+ hours of clinical experience that I was required to obtain throughout the years. My student clinical experience was heavy in family practice but also included pediatric rotations and an urgent care rotation. During clinical rotations, I garnered experience in the assessment, diagnosis, and management of acute and chronic diseases. I was able to see patients with a variety of chronic and acute health conditions such as but not limited to diabetes, stroke, arthritis, COPD, asthma, dementia, depression/anxiety, UTIs, pharyngitis, otitis media/externa, URIs, rashes,

fractures, STDs, abscess, diverticulitis, and pneumonia. My family practice rotations emphasized health promotion and health maintenance with acute visits, annual exams, well woman exams, and Medicare wellness visits. Throughout these hours, I was able to build relationships with my preceptors and patients. I obtained information through the assessment and exam process, analyzing this data in order to implement evidence-based practice interventions aimed at promoting health and healing.

Conclusion

The last two semesters of my DNP education were the culmination of all of the DNP essentials with the implementation of a QI research project. This project has opened my eyes to how changes in practice can be made to improve patient care to meet standards. It has also opened my eyes to how difficult this process can be. I believe this QI project will carry with me through my DNP career by allowing me to recognize deficits in my practice and attempt to improve them through research aimed at evidence-based practices. All in all, the MSU DNP program far exceeded the DNP essential standards while preparing me for my future practice.

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APPENDICES

APPENDIX A

LOGIC MODEL

Logic Model

