Reducing Readmission Rates Among Diabetic Patients by Using Transition of Care Protocol

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Abstract

One in five patients with diabetes are readmitted to hospitals within 30-days after discharge. Majority of the complications leading to readmission arise during the patients' transition from hospital to their communities. In a managed care setting with increased readmission rates among diabetes patients, there exists no transitional care framework implemented when discharging patients. The purpose of this quality improvement project was to design and implement a collaborative nursing transition (TOC) protocol for case managers and care coordinators to help reduce 30-day readmission rates in patients with diabetes. The transitional care theory guided the development and implementation of the intervention, which involved educating the care coordinators and case managers on the use of the TOC protocol. The project data was collected using pre- and post-test assessment of the participants' knowledge and attitudes, chart audits on the use of the TOC protocol, and patient records of readmissions. A paired sample t-test analysis of the pre- and post-test scores indicated a significant improvement (t (59) = -3.185, p = 0.002) in the participants' knowledge and attitudes. A fisher's test of the readmission rates before and after the implementation did not indicate significant changes (p>0.05), while the chart audit indicated 60% compliance with the protocol. Educating the participants about the TOC protocol led to improved knowledge regarding transitional care and change in practice among the participating care coordinators and case managers, which reduced readmissions although the change was not statistically significant. The TOC protocol should be sustained at the project setting with annual educational sessions in addition to those targeted to new staff.

Keywords: readmissions, care coordination, collaborative transitional care, diabetes.

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Diabetes is a chronic condition affecting all age groups with individuals over 65 years at a higher risk (Butalia, 2020). One out of every five diabetic patients are readmitted back to the hospital within 30 days of discharge (Duke et al., 2013). Harkness (2020) reports that during transition of care, miscommunication between the providers and the ability of the new care facilities to meet the needs of patients may cause complications.

Transition of care (TOC) is the transfer of a patient from one care setting to another. We use the transition of care model when discharging a patient back to the community and is a complex process requiring the collaboration of case management and care coordination departments to ensure a safe discharge. Patients who move across care settings and experience high rates of post discharge complications, readmissions or morbidity and mortality benefit from TOC (Enderlin et al., 2012). Therefore, this Doctor of Nursing Practice (DNP) project will address readmission rates reduction for patients diagnosed with diabetes mellitus (DM) by using a TOC model in managed care. The project lead will focus on the use of the TOC model in the case management and care coordination departments of a managed care organization.

Background

Nine and three tenth percent of the American population, representing over 30 million people, live with DM, while 28% are undiagnosed (Duke et al., 2013). 25% of hospitalized patients are diabetic with a readmission rate of 14-22%, which is higher than the rate for all hospitalized patients that is estimated to be 8.5-13.5% (Rains, 2020). Patients diagnosed with DM are more likely than those without DM to be readmitted with other complications, such as heart failure, cardiac surgery, and myocardial infarction (Rubin, 2015).

Diabetes mellitus is a costly disease with direct medical cost of about $218 billion per year, besides indirect expenditure of $46 billion per year. Significant contributions to these expenditures are the readmission cases (Harkness, 2020). Studies associate lack of TOC protocol for diabetic patients with problems that hinder positive outcomes and increase readmission rates. Some challenges affecting this patient population include nonadherence to prescribed medications, lack of education on insulin injection, self-care measures, and healthy nutrition.

According to Garnica (2017), lack of discharge processes causes high readmission rates among diabetic patients. Often, there is inadequate coordination between the care provider and the caregiver at home. A lack of resources in the community setting, inability for the patient to manage self-care, and a low level of health literacy of the patient and the caregiver at home contribute to recidivism. Harkness (2020) notes that instances of poor care coordination can occur between the inpatient and outpatient settings when a patient discharges from the care facility to the community.

These events include lapses of communication between care providers in the inpatient and outpatient settings and include medication changes, diagnostic workups that are not done before the patient discharges, a lack of understanding of the diagnoses between the caregiver, patient and care provider, inadequate patient comprehension of medications, and insufficient coordination of the patients' follow-up needs at the time of discharge (Price, 2021). Therefore, it is necessary to create protocols using the TOC model as a framework to improve the transition process.

Creating a TOC protocol will guide the discharge process to ensure proper communication between the two settings (Duke et al., 2013). A well-formulated TOC protocol is a multidisciplinary approach to better understand discharge instructions and provide the resources

needed for quality home care, thus reducing the readmission rate. The TOC model ensures that the patients' caregivers, informal support, and the home health agency caregivers in the community setting receive information regarding the patient's health status and the measures to guarantee proper care at home.

A patient is most vulnerable to adverse events when transitioning from the hospital to home (Harkness, 2020). Lack of care coordination and inadequate TOC protocols cost the healthcare system $46 billion a year (Harkness, 2020). Every year, DM patients' admission stay cost the United States $378 billion and readmission due to lack of TOC leads to an increase in the length of stay for patients in care settings, which further increases the financial burden. (Vandensande, 2020).

Problem Statement

There is a rising concern with readmission rates of DM patients. 14 percent of DM patients readmit within 30 days because of the lack of a TOC protocol to ensure that patients attain the health objectives set in the inpatient setting. Also, lack of adequate preparation before discharge leads to many patients returning to the healthcare facility because of various complications associated with DM (Rains, 2020).

Implementing an appropriate TOC protocol in the case management and care coordination department, which would address the gaps in the current interdisciplinary discharge process could prevent readmissions and associated costs (Shillington & McNeil, 2021). The project site does not use the TOC model framework in the discharge process, resulting in the duplication of services and missed responsibilities that have affected patients. It has also caused an increase in readmission rates within 30 days of discharge and has increased pressure for managed care organizations to improve care coordination (Grady et al., 2021). The project lead

proposes implementing discharge protocols using the TOC framework to address these gaps in best practice to improve quality patient care.

Project Question

In case managers and care coordinators (P), how does the use of a TOC protocol (I) compared to the current practice without TOC protocol (C) reduce the readmission rates for patients diagnosed with DM (O) within 4-5 weeks (T)?

Search Methods

A systematic literature search of the academic databases was conducted including the PubMed, Web of Science, Overview (SCOPUS), and the Cumulative Index of Nursing and Allied Health Literature (CINAHL) in Jay Sexter Library. These databases contain academic nursing research articles from peer-reviewed journals that are appropriate for clinical decision-making. They combine several search terms derived from the PICOT question. The search was refined by combining search terms and using the Boolean operator 'AND.' The resulting search phrases included "case managers transition of care and care quality 'care transition by coordinators' and 'self-care, DM, and DM self-care.

The initial search generated over 1000 results, but not all of them applied to this search technique. Then, the search was further refined by excluding articles published before 2016 to ensure this search only included recent scientific information relevant to modern patients with DM. Eligibility for inclusion consisted of full-text articles published in English. The exclusion criteria delineated any narrative review articles, editorials, monographs, abstracts, experience reports, dissertations.

These criteria reduced the search results to 113 articles, which were further appraised by reviewing the titles and abstracts. In reviewing the reference list of articles for any relevant

information, 23 articles contained critical appraisal. The criteria gave three publications which extensively analyzed DM. Therefore, only the three publications from the Jay Sexter Library qualified to be included in the literature synthesis.

Review Synthesis

The search generated recent research articles (2016-2021) with scientific information relevant to modern patients with diabetes mellitus. Older articles could include outdated information that is irrelevant to current care settings. Combined, the articles showed the efficacy of TOC protocols by case managers and care coordinators in reducing readmission rates, improving self-care, and enhancing at-home quality care for patients with DM. Weber et al. (2017) conducted an integrative review focused on care transition between a patient's in-hospital stay and home care.

The authors concluded how important improving the organization of nurses and their activities are in managed care organizations to deliver better care coordination during the transition process. Weber et al. (2017) identified five themes after the comprehensive review, including planning for discharge, health education, coordination with other health care services, and follow-up after discharge. The study showed the need for further research on TOC to help implement integrated health systems. The study has also provided evidence that promoting care coordination in managed care discharge processes is important.

In a different study, Black and Duval (2019) found specific factors showing the quality of care is provided in managed care organizations. These indicators include preparing discharge care, education provided to patients and their families, continuity of care after discharge, and follow-up services. Elsewhere, Gallagher et al. (2017) focused on bridging administrative silos between various care management programs to improve the care and patient experience. The

study identified various themes, including the process and communication in care provision, care transition, and patient experience. Patients with complex medical needs had a higher readmission rate. TOC reduced readmission rates for patients with diabetes and related complex medical conditions (Black & Duval, 2019).

Studies have revealed a gap in care coordination that affects care delivery, including lack of social services at the community level after discharge, little and reduced access to care within community settings, and poor communication. Poor communication between patients and care professionals after discharge influences outcomes. While in the community, the patients cannot access key information regarding their health because of lack of social services in the community. The healthcare service providers, such as doctors, cannot assess patients' progress after discharge since when the patient joins the community with no social services, it becomes difficult to trace them, and assess their progress. Multiple problems develop because of absence of transition of care protocols in managed care organizations (Black & Duval, 2019).

The high costs of healthcare services are greatly impacted by increased readmission rates (Black & Duval, 2019). Communication gaps between care providers and patients after discharge should be addressed to ensure proper care transition (Black & Duval, 2019). Updating the transition of care protocols will ensure that care providers, care coordination, and case management departments collaborate in taking care of the DM patients. Therefore, patients diagnosed with DM could have sufficient access to fundamental services to break this cycle and reduce readmission rates and thus reduce healthcare costs (Gallagher et al., 2017).

Theme Development

Diabetes is a chronic condition associated with high readmission rates after discharge from a hospital to the community setting. Some factors, such as lack of TOC protocols and

diabetes-related complications, cause high readmission rates. Transition of Care (TOC) protocols entail guidelines which dictate the movement of a patient from one care to another, and in this case, from hospital care to community care. These factors encompass absence discharge processes and poor quality of care while transitioning from the hospital to the community care setting. This can negatively affect the patient's finances, insurance and payment of services. Readmissions also increase when patients transfer to the community without adequate resources, such as caregiver education and community support systems (Brumm et al., 2016).

Communication

Communication lapses between care providers in inpatient and outpatient settings is devastating, yet a preventable problem. Miscommunication can cause misunderstandings regarding medication changes, diagnoses, and follow-up needs in community settings. The American Diabetes Association [ADA] (2020) has provided guidelines for patients being discharged from the hospital to the community setting.

The strategies from ADA guidelines include supportive clinical information systems, self-care management, and community resources and policies (ADA, 2020). Care transition is central to fulfill these ADA recommendations. Care providers are obligated to preserve the patients' safety and well-being as they transition to community care. Lack of transition of care protocols and care coordination can lead to potentially devastating patient outcomes and unnecessary healthcare spending (Shillington & McNeil, 2021).

Healthcare Costs

When patients readmit to the hospital, managed care organizations spend more resources to provide care. Care providers spend approximately 378 billion dollars every year because of patients' prolonged stay in managed care organizations (Shillington & McNeil, 2021). Such

spending amplifies pressure on managed care organizations as they promote care coordination to enhance care delivery. Lately, lack of transition of care protocols has increased the number of DM patient's readmission, causing increased payment to providers. TOC model will help streamline healthcare delivery after discharge, which will lower readmission rates and hence lowering the costs of healthcare. The primary themes identified for the project include TOC for DM patients, discharge protocols in managed care organizations, a reduction of readmission rates, and collaboration between care coordination and case management departments.

Review of Study Methods

Twenty-six studies were identified, but only three studies were chosen for review. The three studies on transitions of care reviewed in the literature synthesis employed different research methodologies, a focused review (Black & Duval, 2019), integrative review (Weber et al., 2017), and descriptive longitudinal analysis (Gallagher et al., 2017). Each of these methodologies shows distinct strengths. The descriptive longitudinal analysis is a distinctive method allowing researchers to examine the same sample of participants over an extended period to determine any changes in outcomes (Caruana et al., 2015).

Researchers observe the effects of treatment without interfering with variables. This method enabled Gallagher et al. to examine a cohort of 17 patients who were readmitted to the hospital within 30 days of discharge. Most of the patients readmitted several times during the study period, which allowed the researchers to determine the factors contributing to high readmission rates relative to care transition. The descriptive longitudinal analysis design was appropriate for this study because Gallagher established the correlation between care transition protocols on readmission rates by examining the cohort multiple times.

In contrast, Weber et al. (2017) and Black and Duval (2019) conducted integrative reviews. Both review designs involve the systematic analysis of multiple research articles with heterogeneous methodologies to summarize underlying themes and conclusions. Integrative reviews generate reliable evidence because researchers can analyze many studies to establish gaps in literature, gauge the strength of literature, and show the need for additional research (Russell, 2005; Whittemore & Knafl, 2005).

Both focused and integrative reviews involve rigorous appraisal criteria of research articles to ensure the data included in the analysis are reliable and relevant. Results from such studies are more comprehensive and credible compared to data from a single descriptive study. The current literature synthesis incorporated evidence from research articles with reliable methodologies that show how TOC protocol promotes care quality for patients with DM.

Aims of the Project

The DNP project is a quality improvement program aimed at reducing readmission rates for patients diagnosed with diabetes to reduce health care costs for that population.

Project Objectives

The main objective is to design and implement a collaborative nursing transition protocol among case management care coordination departments period. The objectives for this DNP project will be completed within four to five weeks.

The objectives of this DNP project are:

a. To complete the transition of care protocol for patients diagnosed with diabetes being discharged from the acute setting to community setting.
b. To educate the providers on the new transition of care protocol.

c. To improve the knowledge and attitudes of the providers regarding transition of care of diabetic patients from acute to community setting.
d. To evaluate compliance of providers in utilizing the new protocol in practice within four to five weeks of implementation**.**
e. To evaluate readmission rates prior to project implementation, during project implementation and then one month after the implementation.

Theoretical Framework

Transition is defined as changes in lives, health, relationships, and environments (Garnica, 2017). During transitions, nurses' step in and provide a therapeutic medium helping an individual have a smooth changeover from one care setting to another. The transition theory is significant to the process that occurs when a patient is going through changes in their lives and the nurses who provide help and guidance to achieve positive outcomes (Gill & Shanta, 2020). This theory is essential for the DNP project, which focuses on the transition of care for DM patients to reduce readmission rates and healthcare costs (see Appendix A).

Transition of Care protocols can decrease readmission of patients newly diagnosed with DM after they discharge from the hospital to community settings. The transition process exposes multiple risks to patients including a high possibility of readmission, poor outcomes, high care costs for patients and care providers related to readmissions (Black & Duval, 2019). Therefore, implementing TOC protocols will better meet the needs of patients diagnosed with DM by providing access to quality care and caregiver support during the transition between settings.

Historical Development

Nursing practice is guided by nursing theories, which describe phenomena and provide fundamental treatment principles. The transition theory that focuses on the nature of nursing

practice is one of the most applied mid-range theories developed by the Egyptian theorist Afaf Ibrahim Meleis (Gill & Shanta, 2020). Meleis stated, that “nursing was always a part of her " (Geary & Schumacher, 2019, pg number). She became the first individual in Egypt to obtain a Bachelor of Science in Nursing (BSN) degree from Syracuse University and then the first nurse to obtain a Master’s in Public Health (MPH) as well as a Doctor in Philosophy (Ph.D.) from the Egyptian University.

She moved to the United States (US) and pursued her graduate education as a Rockefeller Fellow. In 1964, she received her Master of Science (MS) in Nursing (MSN) from the University of California, Master of Arts (MA) in sociology in 1966, and Doctor of Philosophy (Ph.D) in medical and psychology in 1968 (Gill & Shanta, 2020). Meleis worked as an administrator and acting instructor at the University of California in Los Angeles as an assistant professor. She later went to the University of California in San Francisco, where she spent approximately 34 years, and this became the birthplace of the transition theory (Gill & Shanta, 2020).

Meleis focused her research on the transition process. The theory posits that nursing involves helping individuals going through changes that may either be physical such as illness or developmental, such as the birth of a child (Geary & Schumacher, 2019). Nurses provide primary care to patients and their families during transitions, where they attend to changes as well as the demands that are brought about by the process of transition (Harkness, 2020). Meleis investigated interventions aimed at ensuring a healthy transition. She associated an unhealthy transition with role inefficiency. The goal of healthy transition was defined as the mastery of behaviors, cues, sentiments, and symbols associated with roles and unproblematic processes (Gill & Shanta, 2020).

Tenets of Transition Theory

The middle-range theory of transition contains several major concepts: types and patterns of transitions, the properties of the transition experience, transition conditions, process indicators, and nursing therapeutics (Joly, 2016). Changes take various forms, such as developmental, health and illness, situational, and organizational (Kelly, 2014).

Patient Engagement

Patient engagement should be optimized through comprehensive and consistent efforts by the healthcare professionals to identify the outcomes of the given healthcare services, assess the patient's needs and capabilities, foster decision making concerning their plans, promote accountability for the shared care plans, and ensure trust and good relationship with the patients (Naylor et al., 2017).

Caregiver Engagement

The role of the caregiver is essential in the transition of care of diabetes patients. Healthcare professionals should engage the caregivers to ensure a smooth transition (Naylor et al., 2017). Here, identification of the most important outcomes of care to the caregiver is made. The caregiver’s capabilities and needs are assessed, fostering shared decision-making relating to the patient's care. The healthcare professionals should also ensure that shared accountability based on the care plans and the relationship with the caregivers is respectful (Naylor et al., 2017). The caregiver is given an important position in transition care, which will improve the outcome of the whole process of transition care.

Complexity Management

The complexity of management should be considered during the transition of care of diabetes patients (Naylor et al., 2017). It should be individually customized for the patients, holistic and consistent with the goals of the program. The challenge of management faced by the

clinicians and the caregivers depends on the severity of the condition since it involves managing physical, emotional, and social needs (Naylor et al., 2017). By considering the complexity of the situation and identifying possible needs of the patient, it will be easy to address during the transition of care.

Patient Education

Patient education should be a continuous and interactive process involving the health professionals and the patient (Naylor et al., 2017). This process is crucial because it ensures that the patient is aware that health is their responsibility, and hence it encourages the patient to make decisions towards a healthy lifestyle. Patient education also increases the patient's adherence to medication and therapy, which promotes better health. It also reduces the adverse events resulting from the illness and promotes independence in the patient's daily living (Naylor et al., 2017). Here, the patient is given education about diabetes, the management options available, and healthy living.

Caregiver Education

Education of the caregiver also improves the care given to the patient once in the community. Caregivers should be taught different skills to identify and manage the worsening symptoms of diabetic patients on transition care (Naylor et al., 2017). The caregivers are also provided with access to community resources which supports the development of confidence and competencies essential in providing the patient's needs and needs.

Well-Being of the Patient and the Caregiver

The wellness of the patient and the caregiver should be considered during the transition of care. The healthcare givers should acknowledge their skills. They should be respected and

treated as human beings regardless of their emotional reactions, and their decisions that support the patient's needs should be supported (Naylor et al., 2017).

Care Continuity

Individualized comprehensive care plans should be implemented (Naylor et al., 2017). These plans should ensure that there is accessed to appropriate, high-quality community patient care. The patient's continuous access to comprehensive care fosters the health of the patient.

Accountability

The clinician and the whole team involved in the transition of care should assume the role of ensuring quality implementation of the transition of care (Naylor et al., 2017). There should be a partnership between clinicians and patients in developing patient care plans and ensuring their effective implementation. There should be teamwork among the different individuals involved, and there should be organizational accountability to ensure a conducive environment for the implementation of transition of care (Naylor et al., 2017).

Markedly, the DNP project focuses on the health and illness transition, including the diagnosis of diabetes, a chronic condition, the recovery process, and hospital discharge. The properties of the transition experience are not fundamentally disconnected, but they are interrelated as a complex process. These properties have sub-concepts such as awareness, engagement, change and difference, time and span, and critical points and events (Joly, 2016).

Awareness

The awareness sub-concept involves the perception, knowledge, and recognition of a patient on the transition experience. According to Kelly (2014), a patient in transition needs to be aware of the process and expectations. In the DNP project, DM patients need to be aware of their

transition to experience, which helps identify a patient's readiness for care transition.

Engagement

Another property of transition is engagement, and this is defined as the involvement of a person in the transition process. The awareness of an individual on the transition process influences their level of engagement (Joly, 2016).

Change and differences

Changes and differences are properties of transitions, where changes that individuals experience during transitions generate a sense of movement from one setting of care to another. The differences are the challenging aspects that a patient has, including unsatisfied expectations or feeling dissimilar. Nurses must ensure that a patient's comfort level is sufficient to deal with the changes and differences during the transition of care.

Timespan

Timespan is a property of transition that involves movement over time (Joly, 2016). DM patients have an identifiable starting point of change that is often characterized by confusion, distress, and instability (Joly, 2016).

Critical points and events

Nurses should step in to alleviate these adverse effects of transition on patients. Critical points and events are markers, such as diagnosing a disease, and they are used to intensifying awareness of changes or boost engagement in the transition process (Joly, 2016). Case managers need to maximize care quality for DM patients as they undergo these critical markers.

The next concept is the transition condition, defined as circumstances and barriers influencing the movement of a person throughout the transition process (Garnica 2017). Common transition conditions include personal factors such as cultural beliefs and

socioeconomic status, community factors like community resources available for the patient in the community setting, and societal factors such as marginalization of some communities (Garnica 2017). The theory cautions that the DM patients involved in the DNP project are also subject to these conditions. The fourth concept concerns indicators for a healthy transition process, classified into process indicators and outcome indicators (Joly, 2016). Process indicators help nurses assess DM patients and common risks to develop interventions that maximize positive outcomes. Outcome indicators help nurses to check if the transition is healthy or not (Garnica 2017). The last concept of the transition theory involves nursing therapeutics, which measure therapeutic interventions during the transition process.

Project Setting

The DNP project will take place in a Managed Care Organization located in the Southeast area of Dallas, Texas. The organization works with the Health and Human Services Commission (HHSC) of Texas to facilitate the patients in transitioning from the acute setting to the community setting. The organization has over 500 employees and serves more than 50,000 multiethnic Medicaid patients of all ages, however, the elderly population is the majority. Li et al. (2021) argues that there is a myriad of organizational issues in managed care settings that directly influence the high readmission rates among patients diagnosed with diabetes mellitus. Given the prevalence of readmission incidents, this an ideal setting for implementing this quality improvement project.

Electronic Health Records (EHR) are used for documentation by all departments and will be utilized for the project. QNXT is the name of the system the organization uses for documentation and for processing claims from which the high readmission rate report is pulled.

The high readmission rate report shows cost and the readmission rate within 30 days of discharge from the acute setting and will be the main source of data for this project.

Population of Interest

The populations of interest for this project are the 45 care coordinators (CC) and 15 case managers (CM) who are nurses. On average, these nurses have worked in their respective departments for seven years, so they are familiar with organization's current policies, procedures, and workflows. They are included in this project because their work directly impacts the TOC outcome. The case managers are responsible for completing post-hospital assessments to identify patients' needs, while the care coordinators focus on coordinating care with other community providers to ensure identified needs are addressed. These nurses will be educated in the new protocol regarding discharges and community transitions to reduce readmission rates.

Patients diagnosed with DM will be the indirect population for this project as they are the primary beneficiaries of the intervention. According to Rains (2020), 25% of hospitalized patients have diabetes, with a readmission rate of 14-22%, which is higher than all hospitalized patients and estimated to be 8.5-13.5%. Rubin (2015) further adds that patients diagnosed with DM are more likely than those patients without DM to be readmitted with other complications, such as heart failure, cardiac surgery, and myocardial infarction. In this regard, the project was designed to positively impact this patient population indirectly by improving TOC practices. In addition, nurses from other departments, those who are on leave of absence (LOA), and all administrative staff will be excluded from the project.

Stakeholders

Considering the nature of the project, the full support of the organizational leadership is required. Their primary roles are to provide approvals for carrying out the project within the

organization, managing the existing human resources, and providing social support to the DNP student and nurses in order to ensure the successful completion of the project. Edwards et al. (2019) stated the administration team forms the backbone of a quality improvement approach as they provide a purpose for unity while at the same time outlining the direction for the organization.

Case management and care coordination managers, utilization management director, and the vice president (VP) of operations play vital roles in the success of this project. The VP granted permission in writing to conduct the project at the project site (see Appendix B), the directors identified subject matter within their departments and the case management and care coordination managers mobilized nurses to participate in the project. Similarly, the utilization management team will provide the needed data such as a readmission report for identification of diabetic patients with readmission to acute setting in less than 30 days after discharge. The project lead will also obtain a utilization report that shows the financial impact of patient readmission within 30 days. Meetings will be held routinely with the utilization management leadership and managers of the CC and CM departments to attain support and feedback. Relevant communications regarding project topic will enhance buy-in and relationship building between the project lead and stakeholders.

The nursing staff represents another set of stakeholders in this DNP project. They are the individuals who have direct contact with patients and will be implementing the protocol. Finally, patients diagnosed with DM will be the beneficiaries of the positive outcome of the project and are the indirect stakeholders.

Intervention

This quality improvement intervention involves educating the care coordinators and case managers on the use of TOC protocol to reduce readmission rates for diabetic patients as they transition from acute to the community setting. The transition protocol needs to be comprehensive, and it is more efficient when the interventions are individualized to meet every patient's needs (Garnica 2017). A detailed intervention timeline has been provided below.

Week 1

The project lead will collect pre-implementation data from one month prior to include the readmission reports of diabetic patients, readmitted to the acute care setting within 30 days of discharge. A pretest will be administered for the case managers and the care coordinators to test their knowledge in transition of care. Training will be conducted for the participants in three two-hour sessions. A post-test will be administered immediately after training; the overall pass grade is 80 percent. A group remediation will also be conducted for participants with less than a passing grade. The data collected will be inputted into an SPSS software version 17.0.

Week 2-4

The TOC protocol will be implemented, and the project lead will be on the premises to offer support, answer questions and ensure compliance among the case managers and the care coordinators. At the beginning of week three a retrospective chart audit will be conducted to look at week two by utilizing an audit tool to evaluate provider compliance with the protocol. The audit tool will be used to identify any gaps with the TOC; if any gaps are identified, they will be addressed by collaborating with the community providers involved such as the pharmacist, transport companies, and home health agencies.

Week 5

Project implementation will continue through this week. Final data collection will occur at the end of week 5. The project success will be measured by comparing the readmission rates of DM patients for four weeks during the implementation of the TOC protocol and the readmission rates four-weeks prior to the implementation. At the end of the week all the results from the implementation phase will be analyzed using the SPSS program and stored in an excel spreadsheet.

Tools

The tools that will be used are from existing evidence-based guidelines and some tools will be developed by the project lead. The intervention will also utilize managed care resources to ensure the transition is well executed. The TOC protocol will contain evidence-based tools to be utilized as one cohesive process for the purpose of reducing readmission rates for the patients diagnosed with DM. The tools provided should not be considered a separate entity as all the tools are essential for project success. The protocol consists of step-by-step instructions for the care coordinator and case manager to perform using a collaborative approach.

The Transition of Care Protocol

The TOC protocol was developed by the project lead; it is step-by-step instructions on the process to care for a diabetic patient after discharge from acute to community setting. (See Appendix C.) The project lead will obtain approval from organizational leadership to utilize the protocol. The protocol is broken down into four parts A to D.

Part A: The patient is discharged from the acute setting to the community

The TOC protocol explains the responsibility of the case manager and care coordinator up to 72 hours after patient's discharge from an acute setting. The protocol provides step-by-step tasks that both the care coordinator and case manager must perform together, which was

overlapped and duplicated in previous practice. These two nurses have individual roles to perform in the patient's care plan. However, gathering the information needed to assist the patient is the same. In the current practice, the patient had to be assessed twice and many of the questions were the same. This TOC protocol will streamline the process for both the patient and the participants. The two nurses will both perform the initial patient assessment together; however, each nurse will obtain the appropriate information needed to complete their responsibilities to the patient.

Parts B and C: Post Discharge Assessment

These two parts of the TOC protocol provides both the case manager and care coordinator step by step procedural instructions in how to perform the post discharge assessment (PDA) call or visit. Part B of the TOC protocol consists of specific information gathering questions designed to utilize best practices when providing patient care. The process entails the patient interview, performing a needs assessment, assisting with transportation if needed to follow up appointments, medication reconciliation, and education. Part C of the TOC protocol incorporates patient monitoring over a timeframe of six weeks. During this time, care-planning is performed to include an inter-disciplinary approach based on the post discharge assessment. This care plan will address any behavioral, social, and healthcare needs the patient may have. The care-planning team includes the patient, caregivers (family), physicians, and therapy if needed. The purpose of this meeting is to identify patient needs, reduce any identified gaps in care, and to formulate a plan moving forward with both short-term goals and long-term goals to keep the patient from being re-admitted to the acute care setting.

Part D: Post Six Weeks Monitoring

Part D of the TOC protocol involves the patient hand-off from the case manager to the care coordinator who has the sole responsibility of following the case through the long-term goals. The care coordinator continues to meet with the care-planning team, which does include the case manager, to determine if the goals were met or if the goals require revision. This is to be completed on a quarterly basis (Bode, 2009).

Pre and Post Test

The pre and post-test tool will be used to gauge the participants attitude and knowledge of the TOC for diabetic patients. (See Appendix D) This tool was developed by the project lead and will be utilized in assessing the participants' knowledge and understanding of diabetes and of the new TOC protocol. There are ten multiple choice questions on the test. Participants' will be expected to score 80% and above to pass the post test. A group remediation will be conducted for participants who score below 80%. Multiple choice questions are an efficient and effective way to evaluate learning objectives (Brame,2013).

Content Validity Index (CVI)

The pre and posttests administered to the participants were developed by the project lead to incorporate specific questions pertaining to the new TOC protocol. When a new test is developed, researchers are supposed to provide proof of the test's validity and reliability (Polit & Beck, 2006). The method utilized to prove validity is to calculate a CVI by obtaining the relevance ratings of each test item by content experts (Polit & Beck, 2006). The content experts for this DNP project are the project team. The table containing the rating scale and the results of the calculation are in the appendices. (See Appendix E)

Educational Presentation

PowerPoint presentations will be the main training tool. It will be created by the project lead and provide participants and stakeholders with information pertaining to the disease state management of DM, current re-admission rates for the project site, current evidence-based practice of the TOC for patients diagnosed with DM. (see Appendix F) This educational training is meant to be interactive so that all questions or concerns can be addressed during this time. The point of the education is not only to instruct the participants but to promote collaboration and buy-in. The education consists of a two-hour session to promote the specific processes in the new TOC protocol. The educational session will be offered three different times to ensure all participants can attend.

Chart Audit Tool

The chart audit tool is simply a copy of the assessment, which is aligned with the protocol and placed in a format that is convenient for auditing. (See Appendix G) The participants will complete and document the initial assessment in accordance with the TOC protocol. The assessment will then be scan and uploaded into the note section of each patient's electronic medical record. If the assessment is partially completed, then it is considered a non-compliant chart. Non-compliant tools identified during the audit will be discussed with responsible participant and re-education provided and documented for management tracking. The only sections of the protocol that are expected to be completed are parts A and B and potentially the first step of the Part C section for the patients assessed in week two or week three. Any patients assessed after week three will most likely have only the Part A and B sections completed. This is due to the accommodation of the short time for this DNP project.

Study of Interventions/Data Collection

Readmission Rates

The number for diabetic patients that are readmitted within thirty days of discharge will be collected four weeks prior to the implementation of the TOC protocol and compared with the number of diabetic patients readmitted to the hospital during the four-weeks implementation of new protocol. Data will be collected using a readmission report provided by the organization's analytics team and stored on an excel spreadsheet. All member identifiers will be removed to maintain confidentiality; only the number of readmissions will be collected. The data retrieved from the electronic health record (her) systems will be statistically analyzed using statistical package for the social sciences (SPSS) statistics software version 17 to facilitate data analysis.

Pre and Posttests

Pre and post-tests will be completed by participants to determine improvements in knowledge and attitudes with the TOC protocol. The test method used is a paper and pencil format. Data will be collected when the participants complete the tests. The pretests will be administered and collected prior to the educational session and the posttest will be administered and collected immediately after the educational session. The completed tests will be filed and kept in a locked cabinet that only the project lead and organization's managers working on the project have access to. And then during the implementation process, the project lead will transfer the data to a spreadsheet and store in a password protected computer then shred the paper tests**.**

Compliance

Data to determine participant compliance will be collected through a chart audit. During the chart audit, patient information will not be extracted, only information regarding the protocol will be collected. The chart audit tool will be utilized by the project lead to guide the auditing process. As mentioned earlier, the chart audit tool is identical to the assessment the participants are required to perform, which is aligned with the TOC protocol. The project lead will audit the

chart to ensure the participants have completed the assessment, thus compliant with the protocol. The project lead will access this information in the notes section of the chart where the assessment will be housed. The participants must complete all components of the assessment to be considered compliant. If the assessment is partially completed, the participant is considered non-compliant with the protocol.

Each participant will be assigned a code to ensure anonymity. Only the project lead will know the name of the participant connected to the code. This is the same code assigned to the participant during the administration of the pretest. This process will assist the project lead in identifying the participant who completed the assessment while keeping the identity confidential.

Ethics/Human Subjects Protection

The privacy policy for the project is based on the principles of respect for persons and beneficence (Vilhuber,2018.). The project lead completed the Collaborative Institutional Training Initiative (CITI) program, which educates scholars on how to ethically implement a project or research. The knowledge gained from this program will ensure the project lead will implement this DNP project in an ethical manner.

Readmission Rate

The readmission rate collected four-weeks prior and during the implementation period of TOC protocol will not contain any patient information. The data, which is simply the rate, will be stored on an excel spreadsheet in a password protected computer to maintain confidentiality. No patient information such as personal identifiers will be extracted.

Pre and Posttests

The project lead will ensure participants' names are not used on the test papers. A code will be assigned to the participant, at the time of the pretest, to ensure privacy is maintained. A

separate list matching the participants' codes to their names will also be created and stored in a password protected computer that only the project lead has access to.

Chart Audits

The project lead will determine the participants who cared for the patient through the chart audit. The code for the participants will be placed on the chart audit tool to keep their identity confidential. No patient information will be extracted from the chart. The project lead will only focus on the assessment section to observe if the assessment was completed or not.

The completed audit tool will be locked cabinet in the manager's office where only the project lead and organization's managers will have access. The paper chart audits will be shredded after the information has been transferred to the spreadsheet and stored in a password protected computer.

The data collected including the pre and post test results, chart audit performances, and readmission comparison will be transferred to a spreadsheet; the paper version will be shredded after the data has been transferred and saved on a password protected computer.

The project site does not require Institutional Review Board (IRB) or Quality Improvement (QI) committee oversight. However, there is an IRB process in place at Touro University Nevada (TUN). The project determination form will be submitted as the project team will review all IRB materials to determine if an IRB review is warranted.

Risks and Benefits

Participation in this DNP project is mandated, since this is considered a clinic wide practice change; therefore, no consent is required. There is minimal risk for participants in this DNP project as participation is not a condition of employment. The participants will not be compensated monetarily or through special treatment or favors. Nurses in the case management

and care coordination departments will benefit from the quality improvement DNP project as it would enhance their skills in TOC and streamline current procedures to promote best practices, collaboration, and time management.

Measures/Plan for Analysis

The statistical package for social sciences (SPSS) software version 17 will be used for statistical analysis. This software runs the data that is inputted by the project lead to assist in analysis. The SPSS statistics enables easy investigation of the relationship between variables. The software also allows univariate and multivariate modeling techniques for understanding complex relationships and facilitates visual outputs of statistical data (IBM, 2014).

Readmission Rate

The readmission rates of patients diagnosed with diabetes mellitus, before and after project implementation will be collected using the readmission report provided by the organization's analytics team. The data will be analyzed using the Fisher's exact test, placing the results on a binomial table reporting the percentage of pre implementation readmission rates compared to the percentage of post-implementation readmission rates
with a 95% Confidence Interval.

The Fisher's Exact Test was chosen because it is more accurate with a small sample size as compared to the other tests (Kim, 2017). The Fischer's test is an exact test, which does not rely on approximations such as the chi square test (Kim, 2017). The assumption of the Fisher's exact test is that every observation is mutually exclusive and cannot be cross classified (McDonald, 2009). The Fischer's exact test assumes independence; it makes use of the assumption of independence for the individual observations (McDonald, 2009). The Fisher's test

also assumes the totals of rows and columns are fixed, fixed totals, or ‘conditioned’ (McDonald, 2009). A statistician was consulted for statistical analysis.

Pre and Post Test

Project lead will measure participant’s knowledge using pre and post test scores, participants’ will be expected to score 80% and above to pass the posttest. A paired t-test will be used to analyze results since compliance is measured in percentage (%). The paired t-test compares the means of two measurements taken from the same individual, object, or related units. These "paired" measurements can represent a measurement taken at two separate times (Yaeger, 2021)

An assumption of the paired t- test is that subjects must be independent. Measurements for one subject does not affect measurements for any other subject. Each of the paired measurements must be obtained from the same subject and the measured differences are normally distributed (Yaeger, 2021).

Chart Audit

To determine participant compliance with the TOC protocol, a t-test will be conducted. The t-test is used to measure the statistical significance of the difference between the means of two groups as consideration is provided for variance and distribution (Wadhwa & Marappa-Ganeshan, 2021). Since there is no current protocol in place to compare compliance, a Fisher’s exact test or a paired t-test cannot be used (Kim, 2017). The number of participants in this project is 60; therefore, compliance data obtained from the chart audit will be placed on a binomial table indicating compliant versus noncompliant. The mean of these two groups will be calculated into a percentage with a 95% confidence interval (CI). The 95% CI is a range of

values, derived from the data, to provide the researcher with a 95% degree of confidence that his/her results are the true mean of the population (Wadhwa & Marappa-Ganeshan, 2021).

The assumptions of a t-test are normality; the data collected has a normal distribution. Homogeneity of variances means the data collected from both groups have the same variance. Linearity is the data that has a linear relationship and independence, the data is independent (Wadhwa & Marappa-Ganeshan, 2021).

Analysis of Results

Readmission Rate

One month prior to implementing the TOC protocol, there were nine patients, out of the 125 treated, who were readmitted back to the acute setting within 30 days of discharge to the community. However, that number reduced to three readmissions within two weeks after the TOC protocol was implemented. The number of patients diagnosed with DM used for the pre-test differed from those used in the post-test.

There was a total of 125 patients diagnosed with DM, who were monitored to determine the rate of re-admissions within 30 days of treatment prior to the intervention. There were nine (7.2%) recorded 30-day readmissions before the intervention. After the intervention, all the patients diagnosed with DM were followed to determine those who would be re-admitted by the end of the project. Only three (4.5%) re-admissions occurred from a total of 67 patients seen within the two weeks post implementation period. Figure 1 presents the proportions of re-admissions before and after the intervention. A fisher's test was conducted to test for the association between the pre- and post-implementation readmission proportions. The findings indicated a lack of a significant associations between pre- and post-implementation readmission rates ($p>0.05$) as presented in Table 1.

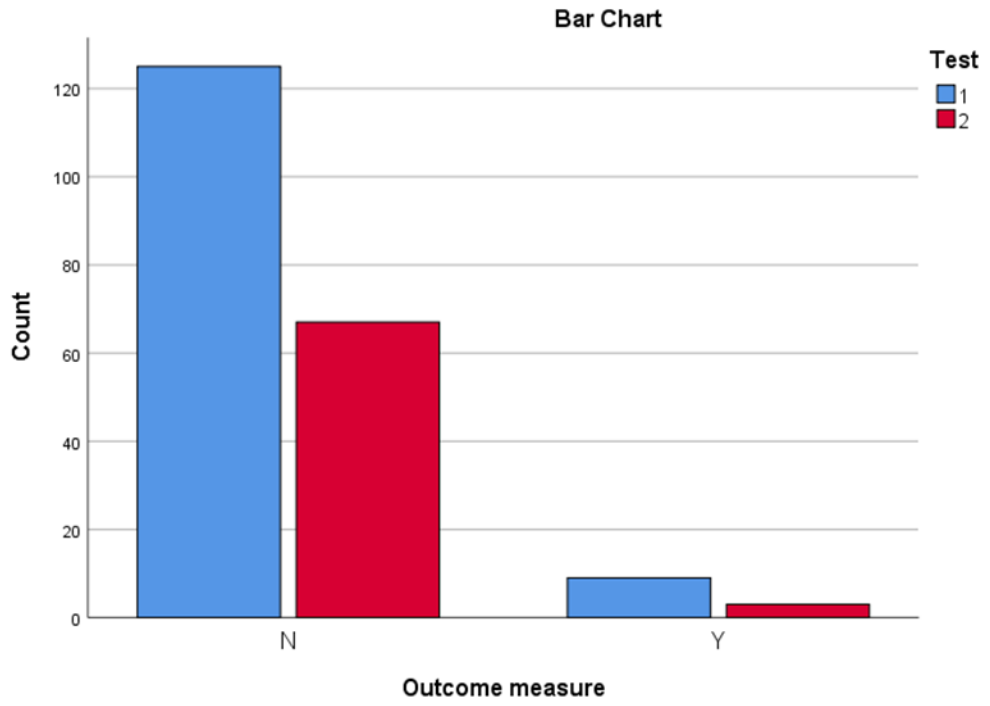
Table 1

Two Proportions Test Comparing the Readmission Rates Before and After the Intervention

Outcome Measure* test cross tabulation				Fisher's exact test	
		Pre	Post	Exact significance (2-sided)	Exact (1-sided) significance
Outcome measure	N	125	67	0.202	0.202
	Y	9	3		
Total		134	70		

Figure 1

Differences in the readmission rates before and after the intervention.



The bar chart above shows the readmission rate pre and post implementation of the TOC protocol. Blue bar chart (N) indicates the total number of diabetic patients prior to intervention and red bar chart (N)indicates total number of diabetic patients after intervention. Y in the figure above (blue/red) shows the total number of readmissions before and after implementation respectively. According to the analytical report, there were a total of 125 diabetic patients in the

facility before the intervention and 67 diabetic patients after TOC protocol implementation. In addition, prior to the intervention, nine patients were readmitted but after the intervention the number reduced to three as shown above.

Pre and Posttest

The pretest scores were the data collected prior to the educational session and the posttest scores were the data collected after the educational session. The purpose for collecting this data is to measure the participants' knowledge and attitudes regarding patients diagnosed with DM and the new protocol. There was a total of 60 participants (*n=60*).

A paired sample-test ~~was the statistical test~~ was utilized for the analysis because the data met the assumptions, which include continuous variables which are a pair of observations for each member of the sample, and lack of significant outliers (Wadhwa & Marappa-Ganeshan, 2021). The average pre-test score for the 60 participants improved from 96.33 (*SD* = 8.82) to 99.5 (*SD* = 2.87) as shown in Table 2. The t-test results indicated the difference (*M* = 3.17, *SD* = 7.7) in the test scores was statistically significant (*t* (59) = -3.185, *p* = 0.002) indicating that the intervention was effective in improving the participants' attitudes and knowledge.

Table 2

Test scores of the participants before and after the education

			Mean	Std.	95% CI				Sig. 2-
Test	Mean	Std. dev	diff	dev	Lower	Upper	T	DF	tailed
Pre	96.33	8.823	-3.167	7.700	-5.156	-1.177	-3.185	59	.002
Post	99.50	2.867							

Note. DF: degrees of freedom. CI: Confidence intervals.

The table above shows the mean of the pretest and posttest as well as standard deviation. The mean score increased from 96.33 before education to 99.50 after education. Also, the standard deviation shows that the protocol was effective in the improving employees' knowledge and attitude toward work.

Chart Audit

During the implementation phase, chart audits were conducted to measure participant's compliance with the TOC protocol. There were 67 diabetic members on the analytic reports received by the project lead. Only fifteen of these sixty-seven patients qualified for chart audit since they had discharge assessment due within the project timeline. Although there were sixty providers educated on the use of the TOC protocol, only six providers assessed the fifteen eligible patients due to project site's assignment distribution. Also, out of the fifteen charts audited, nine (60%) were compliant while six (40%) were identified as non-compliant. since the site does not currently use a protocol, there was nothing to compare the compliance rate to, therefore, a paired t-test or Fisher test could not be utilized. The percentage, mean, standard deviation, with 95% confidence interval of the compliant and non-compliant were calculated and shows 1.091-3.91

Table 3

Percentage, mean, standard deviation, with 95% Confidence Interval

Participants	Number of charts reviewed per participant (X)	X - mean	(X - mean) ^2
1	1	-1.5	2.25
2	6	3.5	12.25
3	2	-0.5	0.25
4	2	-0.5	0.25
5	2	-0.5	0.25
6	2	-0.5	0.25

Sum	15	0	15.5
Size (n)	6	6	6
Average (mean)	2.5	2.5	2.5
Variance (S^2)			3.1
Standard Deviation (S)			1.760681686

Mean = 1+6+2+2+2+2/6 = 2.5

Standard Deviation = 2.25 +12.25+0.25+0.25+0.25+0.25/5 = 3.1 = 1.761

95% Confidence Interval = mean+/- 1.96(SD/square root of N)

95% CI = 2.5 - 1.96 (1.761/2.45) = 2.5 - 1.409 = 1.091

95% CI = 2.5 + 1.96 (1.761/2.45) = 2.5 + 1.409 = 3.91

Discussion of Findings

The project findings indicated that implementing the TOC protocols was effective in improving provider knowledge and attitudes towards transitional care for diabetic patients ($t(59) = -3.185$, $p = 0.002$) and compliance with the protocol among care coordinators and case managers. The project intervention involved educating care coordinators and case managers regarding the TOC protocols for patients diagnosed with diabetes. The effectiveness of the intervention implies the providers' knowledge of transitional care improved significantly following the implementation. Therefore, educating the providers on the use of the transitional protocol led to an increase in their knowledge of the transitional care necessary for patients with diabetes to prevent re-hospitalizations.

Additionally, the participant's compliance with the TOC protocol, for those who were assessed, indicated significant practice adoption (60%) for the initial assessments. Although only six of the educated participants were assessed for compliance, subsequent assessments indicated improvements in compliance with timeline progression. The six participants were assessed

because they were the only cohort of providers assigned to the target patient group during the project implementation period. Each of the six participants was assessed at least twice, and the audits indicated improvements in their compliance with the TOC protocol during the second and third audits compared to the first. Therefore, the project implementation led to adoption of the use of the TOC protocol at the project setting.

The project findings highlight the transfer of gained knowledge to practice by the care coordinators and case managers. In addition to the statistically significant improvement in knowledge and attitudes, the providers' use of the TOC protocol during and after patient discharge also improved significantly. The findings support the theories by Joly (2016) and Naylor et al. (2017) who found evidence supporting the positive relationship between skills/knowledge gained by clinicians and their practices or engagement in care giving. According to Naylor et al. (2017), clinician skills guide their decision-making regarding the best way to address specific patient needs; hence, the effectiveness of an educational intervention can be reflected in the caregiving practices. Additionally, Joly (2016) established a positive correlation between providers' awareness of transitional practices and their engagement with implementation. Therefore, the intervention's effectiveness in improving the providers' adoption of the transitional care protocols is supported by previous literature linking educational interventions and clinicians' practices.

The project outcomes addressed the objectives. The primary aim of conducting the project was to reduce readmission rates for patients with diabetes through the adoption of a collaborative nursing transitional protocol. The project lead's processes of developing and implementing the protocol helped address the objective by educating participants on its use. The implementation of the protocol contributed to improving the knowledge and attitudes of

participants regarding the transitional care for diabetic patients. Additionally, the findings addressed the next objective of the project, which was to evaluate the compliance of the providers in utilizing the TOC protocol. The findings showed 60% compliance rate with the TOC protocol post the project implementation. Although the compliance was not 100% following the intervention, the participant's subsequent audits indicated 100% compliance. The 40% non-compliance was observed only in the first assessment. The participant's improved in using the protocol with experience, which was indicated by their subsequent audits.

The final objective was similar to the project question and focused on evaluating readmission rates of diabetic patients before and after the implementation of the protocol. The findings indicated that patient re-admission rates did not significantly change (r (1) = 0.15, $p >$ 0.05) after the intervention was implemented. Therefore, conclusions can be drawn that the use of a TOC protocol by care coordinators and case managers did not significantly reduce the readmission rates of patients diagnosed with diabetes compared to previous practice where the providers did not use any transitional care protocol. Recommendations of the project include a longer-observation time to determine if similar results would be obtained with a 4-week timeline.

The findings indicating a lack of significant effect on readmission rates following the implementation of TOC protocol contradict those by Black and Duval (2019) and Gallagher et al. (2017) who previously established existing relationships. The findings of Black and Duval (2020) indicated that introducing the use of transitional care reduced readmission rates in diabetic patients while Gallagher et al. (2017) established an inverse correlational relationship between the use of care transition protocols and readmission rates. However, there are methodological differences in the previous studies and this project could explain the variation in the findings. First, the measurement timeline for the readmission rates differs for previous

studies and this project, where at least an observation timeline of four or more weeks exists between the pre and post-test measurements. The timeline for the DNP project was four to five weeks; hence, the post-intervention readmission evaluation time was less than in the previous studies. Additionally, the studies by Black and Duval (2019) and Gallagher et al. (2017) both utilized multiple longitudinal cohorts.

Significance/Implications of the Findings.

The project findings indicated significant effects of the intervention on the participants' knowledge, attitudes, and transitional care practices, which provided insights on the role of educational interventions in nursing practice. The project implications should be sustained at the setting and adopted in other healthcare facilities to include the use of the TOC protocol as a standard discharge procedure for patients diagnosed with DM.

Nurses, interact more with patients and are aware of their changing needs. In evidence-based healthcare practices, education-based interventions are helpful in disseminating the current best practices for nurses and other care providers. The most desirable outcome of educational interventions is the improvement of knowledge regarding the subject of interest as well as its conversion to action. Additionally, the participant's improvement in compliance with the intervention is also a significant indicator of the success of the intervention. The 60% compliance rate with the TOC protocol is sufficient to indicate practice change within the setting, especially with the improved compliance in the participants' subsequent assessments.

Although the findings did not indicate statistical significance in the change of readmission rates among DM patients discharged before and after implementation of the TOC protocol, the rates of readmissions still reduced to some extent (from 7.2% to 4.5%). The findings of this project indicate positive outcomes related to knowledge gain and its conversion

to action, in terms of the provider's actions of complying with the TOC protocol. Therefore, the project findings signify the adoption of evidence-based practices among nursing staff.

Diabetes requires life-long management and self-care; hence, planning in terms of care coordination between different healthcare providers as well as at-home caregivers is necessary (Harkness, 2020). Therefore, implementing a transitional care protocol is likely to improve coordination of care before and after hospital discharge. The participants of this DNP project recorded higher knowledge levels and improved attitudes towards transitional care for diabetic patients. Additionally, the care coordinators and nursing case managers adopted the transitional care protocol following the educational intervention. Therefore, the project findings are significant in emphasizing the need for transitional care coordination across providers and caregivers to improve diabetes management and reduce unnecessary utilization of healthcare services. Transitional care coordination should be mandatory nursing practice implemented for all patients diagnosed with diseases that require life-long management, such as diabetes.

Limitations and Dissemination

The DNP project had some limitations related to its design, data recruitment, collection, and analysis. The pretest-posttest design was used for outcome evaluation; hence, there was no comparison groups among the participants. Although the project findings indicated an improvement in knowledge and change in practice, the validity of these results is weak because there was no control group for comparison. The scope of the design did not allow for a comparison between the observed changes in knowledge and practice resulting from the intervention and a control/comparison group. Additionally, there were no baseline measures to compare the chart audits because a discharge protocol did not exist before the project. Therefore, the results of the project cannot be generalized to different healthcare settings.

The project was also limited by the data recruitment procedures involving 30-day readmissions. The evaluation of the intervention regarding 30-day readmissions was affected by the sample identification method. Readmission rates were measured as unplanned hospital admissions for DM patients treated within 30-days. Although the pre-implementation patient readmission data could be collected by observing patient cohorts treated 30 days before the intervention, the post-implementation sample could only contain the cohort of patients who were treated on the second week of the project to ensure that they were followed for 30 days to monitor readmission occurrences. Therefore, the pre- and post-implementation samples were different in terms of sizes and observation period for the cohorts. These differences in the pre- and post-intervention samples could have affected the validity of the project findings; hence, could be associated with the established lack of significant relationship between the variables studied.

The project was limited by two factors related to data collection and analysis methods: the short timeline and failure to assess all the participants. The short duration of implementation limited the project's evaluation. The sustainability of the knowledge gained from the intervention as well as the providers' compliance with TOC protocol was discussed with the stakeholders to encourage continued use of the TOC protocol.

The project setting had 60 participants who were educated regarding the TOC protocol and its utilization. However, only 10% (n = 6) of the participants were assessed for compliance with the protocol, which is a low proportion of the sample. As a result, the impact of the intervention on the sampled participants' practice may not be accurately estimated. Additionally, there did not exist baseline data regarding the participants' compliance with the protocol. Therefore, the analytical procedures could not be used to establish statistical significance in the

adoption of the TOC protocol. Therefore, there is no conclusive evidence that the implementing the intervention led to the participant's compliance with the TOC protocol.

Dissemination

The project is relevant for nursing professionals as well as DNP students interested in transitional care coordination, management of diabetes, and/or reducing patient readmissions. The project lead will submit the abstract for publication consideration in the Journal of Doctoral Nursing Practice, which publishes peer-reviewed content on evidence-based clinical practices. Publishing the project report in the peer-reviewed journal will reach more nursing professionals interested in this specific topic. The DNP student will present the project report to the faculty and students at TUN. Additionally, the digital and printed copy will be available in TUN library and in the DNP repository for access by students interested in the subject.

Project Sustainability

The effectiveness of the intervention promotes its continued use in the project site and other healthcare facilities providing care to patients with diabetes. The findings of the project are supported by previous literature on the impact of implementing collaborative nursing transitional protocols in reducing 30-day readmissions in patients diagnosed with diabetes. Although the findings did not find a statistically significant reduction in the readmission rates, the results indicate the interventions' potential in reducing 30-day readmissions for diabetic patients. The project lead proposed measures for sustainable and possibly improved patient outcomes to the project setting. The proposed measures for sustainability includes policy implementation by the administrators of the project site that every patient diagnosed with diabetes be included in the transitional care and regular education of care coordinators and case managers regarding the utilization of the TOC protocol is provided.

Policy measures are likely to encourage the utilization of care coordination protocols for every patient diagnosed with diabetes, to improve management transition between providers and caregivers, including self-management. The sustainability of the protocol may be facilitated by frequent education programs focused on the protocol utilization to refresh knowledge as well as target newly hired providers. The education programs can be conducted annually for existing nursing staff in addition to being included in the training protocol for new hires. The project lead will discuss with the stakeholders at the setting regarding the intervention's sustainability and make recommendations for training.

Conclusions

Diabetes affects more than 30 million Americans and contributes to up to 22% of all hospital readmissions in the country (Butalia, 2020; Rains, 2020). Gaps emerging during the transitioning process from hospital to the community have been faulted for the high re-admission rates in patients with diabetes (Harkness, 2020). The use of TOC protocols during discharge is associated with reduced post-discharge complications in patients with DM, hence lower risks for readmission. This quality improvement project aimed to reduce readmission rates in patients with DM by introducing a TOC protocol in case management and care coordination departments of a healthcare organization. The project was guided by the PICOT question: In case managers and care coordinators (P), how does the use of a TOC protocol (I) compared to the current practice without TOC protocol (C) reduce the readmission rates for patients diagnosed with DM (O) within 4-5 weeks (T)

The project was implemented in a managed care organization in Dallas, TX serving more than 500, 000 patients annually. The DNP student sampled nursing professionals working as case managers and care coordinators, who were educated regarding the need and use of the TOC

protocol. The development and implementation of the TOC protocol was framed based on the transition of care theory.

The findings indicated significant improvements in the knowledge levels and attitudes of the case managers and care coordinators who were educated on the protocol's use. Implementing the intervention also led to practice change among the care coordinators and case managers to indicate adoption and adhered use of the TOC protocol when handling discharge procedures for DM patients as indicated by patient chart audits. The readmission rates for DM patients reduced after the intervention compared to a month prior, although the change was not statistically significant. The short project timeline limited an evaluation of long-term adherence in the use of the TOC protocol as well as trends in the readmission rates for patients with DM. Recommendations for practice include sustained use of the protocol and annual education for the nursing staff to refresh their knowledge and awareness of the need for transitional care protocols.

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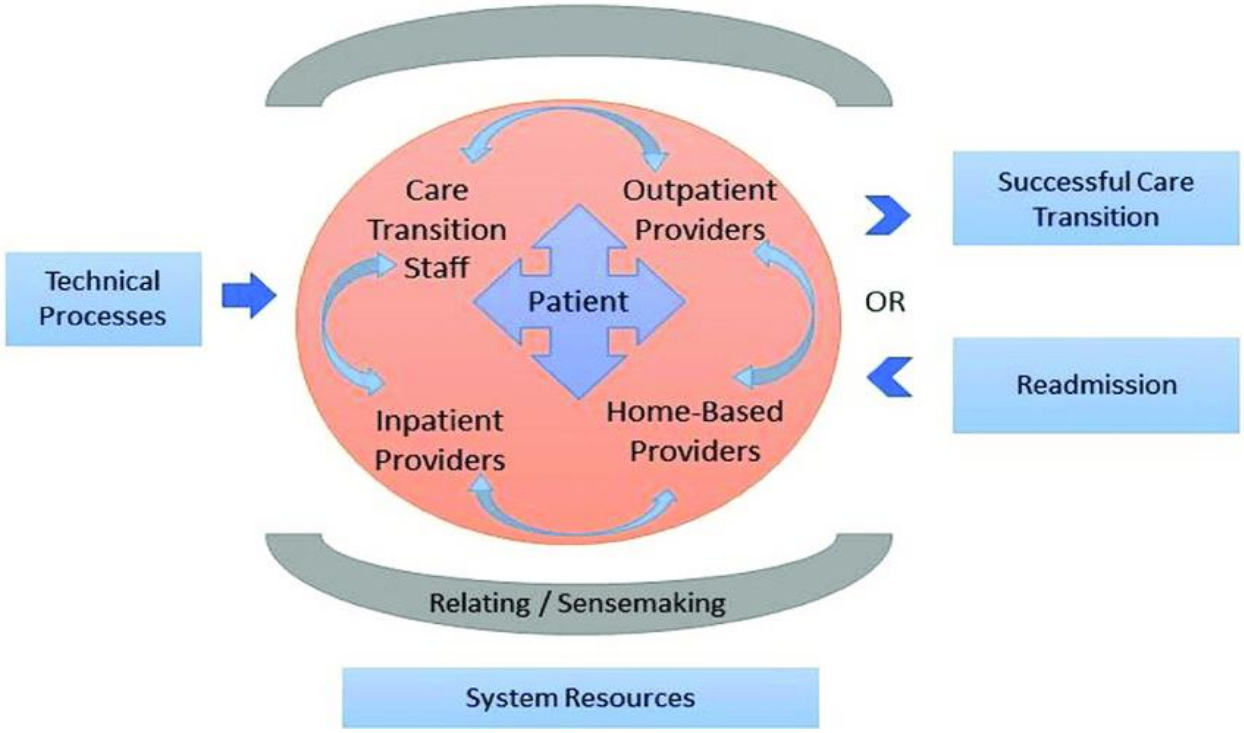
Appendix A

Theoretical Framework



[photo credits: Penney et al., 2018]

Appendix B

MANAGED CARE ORGANIZATION
Dallas, TX/ Province, 75253

08/25/2021

DNP STUDENT,
Dallas, TX, 75432
617-762-2325,
gegeoguadu@gmail.com,

RE: PERMISSION FOR IMPLEMENTING TRANSITION OF CARE PROJECT
Dear Sir/Madam,

We appreciate your effort in submitting a proposal for the care transition project. The organizational management has granted you the permission of use of premises and our staff for the project. The project timeline can begin as soon as you are set with all the requirements as per the organizational policy. You can also contact us via email. We are hopeful that the project will improve quality of life for our Diabetes Mellitus patients.
Thank you for submitting your proposal and efforts to improve medical care.
Sincerely,
Gertrude Gonzalez,
Vice president, operations.

Appendix C

Transition of Care Protocol

A. Member discharges from acute setting to the community

i. The Case management department will be notified of acute discharge and receive discharge paper from the acute setting within 24 hours of diabetic patient discharge

ii. The discharged member is assigned to a case manager based on the zip area of the patient the day notification is received

iii. The assigned case manager notifies the care coordination manager same day of patient's discharge.

iv. Call the member to introduce self and scheduled a post discharge assessment within 72 hours after discharge

v. The Care coordination manager assigns a care coordinator to the member within 24 hours of notification

vi. The assigned case manager and care coordinator meet no later than 48 hours after members discharge to review discharge papers, identify gaps, and discuss possible interventions for already scheduled meeting

vii. Assigned care coordinator and case manager meet with patients in person, via telehealth or telephonic (based on patients' preference) no later than 72 hours after discharge to complete a post discharge assessment

B. **During the Post Discharge Assessment call or visit by the care coordinator and case managers will:**

i. Address follow up with Primary Care Physician (PCP) is scheduled and there is viable transportation or address any other barriers.

ii. Check for patient's symptoms, diabetic self-management knowledge and skills

iii. Provide education and refer to providers as needed such dietician, podiatrist, optometrist/ophthalmologist

iv. Review current medication with patient and reconcile new prescription received from hospitalization. Identify and rectify any barriers that may exist in filling prescriptions.

v. Notify treating physicians of any medication discrepancies

vi. Assist patient with completing a health organizer to cover name of PCP, address, transportation company, name of pharmacy and date of next appointment etc.

vii. Assure that services provided as a condition of discharge such as home health, DME, Diabetic supplies are provided

viii. The Case manager will be responsible for monitoring patient weekly for six weeks post discharge and collaborate with care coordinator as needed to assure patient is stable

ix. Recommend that patients visit Texas Health website at https://www.texashealth-and-Wellness/Diabetes for information on free diabetic education in Dallas-Fort worth area.

Diabetes Education Center

8198 Walnut Hill Lane

Jackson Building. Lower Level

Dallas, Texas 75231

Phone: 214-345-4330

Fax: 214-345-4288

C. **During the six weeks monitoring period**

i. Conduct an interdisciplinary care team (ICT) meeting involving the patient, doctor, caregivers, and providers in the development of care plan that addresses behavioral, social, and multiple healthcare needs.

ii. Care plan should have short term goals example 6 weeks check to see if A1C is trending down

iii. Long term goals example gets it below 6—Prevent hospital readmission

iv. Discuss AIC with the patient and other pertinent labs and notifying physician when AIC is greater than 7

v. Provide community resources to patients who have not completed diabetic self-care program. Recommend that patients visit Texas health website at https://www.texashealth.org/Health-and-Wellness/Diabetes. The organization offers free diabetes education classes and support groups through its outpatient's centers and community -based setting located throughout the Dallas- Fort Worth area.

vi. Outcome of provider follow-ups

vii. Identify barriers to care/gaps and connect the patient with appropriate providers, community services and resources.

viii. Case manager reviews all short-term goals with patients to determine if they are met within six weeks monitoring period. If unmet, goals are reviewed and revised as needed to continue to meet patient's need to prevent readmission

D. **After initial six weeks monitoring**

i. Assigned case manager hands over patient's care management over to assigned care coordinator who becomes the primary owner of the case

ii. The care coordinator continues to work with the case manager, ICT, caregivers, and patient to determine if long term goals are met. If unmet, goals are reviewed and revised as needed to continue to meet patient's need to prevent readmission.

iii. Identify barriers to care/gaps and connect the patient with appropriate providers, community services and resources.

iv. Care coordinator will continue to assess member quarterly or sooner if there is a change in condition or per patient's request for care plan review until goal is met

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Appendix D
Pre and Post Test

Instructions

There are 10 multiple choice questions. Circle the correct answer

Test will be administered prior to and after the transition of care protocol training to evaluate providers understanding of the process

Each question is worth 10 points. A minimum score of 80% or more is required for a passing grade. A score below 80% will be required remediation

1. When does the acute setting notify the case management department of diabetic member discharge?

a. Five days after discharge

b. They are not required to notify anyone

c. Within 24 hours of member discharge

d. When the director reaches out to the acute setting

2. You are the case manager assigned to Mr. Peter and during your Post hospital discharge assessment he tells you he will not be seeing his doctor as scheduled until his daughter who lives 10 hours away comes to visit him in the next 2 months and drives him to the doctor. What would you do?

a. Probe more to understand the reason he wants to wait for his daughter

b. Offer to help set up transportation for him

c. Educate him on the importance of timely PCP follow up/visit

d. All the above

3 A post discharge assessment must be completed within ---------- hours after a member discharges?

a. 24 hours

b. 30 days

c. 72 hours

4.What is the responsibility of the case manage after he/she is assigned to patient's case?

a. Call the patient, introduce his/herself and schedule a meeting

b. Notifies the care coordination manager same day of patient's discharge.

c. Meets with the care coordinator no later than 48 hours after patients discharge to review discharge papers, identify gaps, and discuss possible interventions for already scheduled meeting

d. All of the above

5: Who gets notified when there is a medication discrepancy?

a. Treating physician

b. ER Physician

c. Patient's mother

d. Case management director

6: Who is primarily responsible for monitoring the patient weekly for the first six weeks after discharge

a. The patient's relative

b. Care Coordinator

c. The physician

d. Assigned Case Manager

7 During the Post Discharge Assessment call or visit by the care coordinator and case managers are expected to do the following except

a. Ensure patient follows up with Primary Care Physician (PCP) is scheduled and kept within 2 weeks of discharge
b. Check for patient's symptoms, diabetic self-management knowledge and skills
c. Encourage patient to drink less liquid
d. Assure that services provided as a condition of discharge such as home health, DME, Diabetic supplies are provided**8. How often is the care coordinator required to review a patient's care plan after the initial six weeks of monitoring?**

a. Every 2 weeks

b. Quarterly, when there has been a change in condition, and/or patient request

c. 12 months

d. No follow up needed

9. Which chronic disease is the highest primary future risk driver of utilization based on organization's impact pro data?

a. Heart failure

b. Spinal bifida

c. Diabetes mellitus

d. Alzheimer's disease

10 What was the percentage (%) of diabetic readmission within six weeks of discharge between July and august

a. 10%

b. 2%

c. 90%

d. 0%

Reference

American Diabetes Association. (2020). Standards of medical care in diabetes-2020 abridged for primary care providers. *Clinical Diabetes*, 38 (1), 10-38. https://doi.org/10.2337/cd20-as01

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Appendix E

Test Item Development and CVI Calculation

Purpose

The purpose of this education is to improve the knowledge of nurses in the care coordination and case management departments on transition of care for diabetic patients. The course will also provide education on documentation responsibilities and notification responsibilities in the care of patients with diabetes. The last part will be measured using retrospective chart audits.

Learning Objectives

Upon successful completion of this course, you will be able to:

- Define Transition of Care (TOC)
- Describe step by step the new transition of care protocol.
- Understand the time frame and responsibility of each team member during TOC of diabetic patients.

The population is nurses from the case management and care management department in a Managed Care Organization.

Length of the Test

The optimum length of this test is 10 questions.

Difficulty and Discrimination Levels of Test Items

According to Oermann and Gaberson (2014), a criterion-referenced test is frequently used in clinical settings because it is used to measure set standards rather than on the actual score itself. Since this test will be used for continuing education, low level to moderate difficulty questions was used.

Scoring Procedures to be Used

Each question is worth 10 points with a total possible score of 100 points. If any participant scores 80% or less a remediation will be completed

Item Format

The test will be a selected response multiple choice format

Test Blueprint (there were originally 10 questions. In this example, we have listed 1)

Content	**Level of Cognitive Skill**				
	K	C	AP	AN	Total

				1	
			1	1	
		1	1	1	
	1		1	1	
	1	1			
Total	2	2	3	4	10

Transition of Care

Pre and Post Test questionnaire

(Each question is worth 10 points and should be answered as per the choices given)

1. When does the acute setting notify the case management department of diabetic member discharge?

a. Five days after discharge

b. They are not required to notify anyone

c. Within 24 hours of member discharge

d. When the director reaches out to the acute setting

2. You are the case manager assigned to Mr. Peter and during your Post hospital discharge assessment he tells you he will not be seeing his doctor as scheduled until his daughter who leaves 10 hours away comes to visit him next 2 months and drives him to the doctor. What would you do?

a. Probe more to understand the reason he wants to wait for his daughter

b. Offer to help set up transportation for him

c. Educate him on the importance of timely PCP follow up/visit

d. All of the above

3 A post discharge assessment must be completed within ---------- hours after a member discharges?

a. 24 hours

b. 30 days

c. 72 hours

4.What is the responsibility of the case manager after he/she is assigned to a patient's case?

a. Call the patient, introduce his/herself and schedule a meeting

b. Notifies the care coordination manager the same day of the patient's discharge.

c. Meets with the care coordinator no later than 48 hours after patients discharge to review discharge papers, identify gaps, and discuss possible interventions for already scheduled meeting

d. All of the above

5: Who gets notified when there is a medication discrepancy?

[10 points]

a. Treating physician

b. ER Physician

c. Patient’s mother

d. Case management director

6: who is primarily responsible for monitoring patient weekly for the first six weeks after discharge

a. The patient’s relative

b. Care Coordinator

c. The physician

d. Assigned Case Manager

7 During the Post Discharge Assessment call or visit by the care coordinator and case managers are expected to do the following except

a. Ensure patient follows up with Primary Care Physician (PCP) is scheduled and kept within 2 weeks of discharge
b. Check for patient's symptoms, diabetic self-management knowledge and skills
c. Encourage patient to drink less liquid
d. Assure that services provided as a condition of discharge such as home health, DME, Diabetic supplies are provided

8. How often is the care coordinator required to review a patient's care plan after the initial six weeks of monitoring?

a. Every 2 weeks

b. Quarterly, when there has been a change in condition, and/or patient request

c. 12 months

d. No follow up needed

9. Which chronic disease is the highest primary future risk driver of utilization based on organization's impact pro data?

a. Heart failure

b. Spina bifida

c. Diabetes mellitus

d. Alzheimer's disease

10. What was the percentage (%) of diabetic readmission within six weeks of discharge between July and august

a. 10%

b. 2%

c. 90%

Experts Rating Form Instructions

Rating instructions: For each item, please indicate the following:

Please rate how relevant each item is to the overall construct of early sepsis identification and care by placing a number in the first box to the right of each item.

1 = Not relevant at all

2 = Slightly relevant

3 = Moderately relevant

4= Highly relevant

Your honest feedback is appreciated and will be used to enhance the quality of this questionnaire.

Content Validity Index Table

Item	Expert 1	Expert 2	Expert 3	Mean

1	4	4	4	4.0
2	4	4	3	3.67
3	4	4	4	4.0
4	4	3	3	3.33
5	3	4	4	3.67
6	4	3	4	3.67
7	4	4	4	4.0
8	3	4	4	3.67
9	3	3	4	3.33
10	3	4	4	3.67

The content validity index is calculated using the following formula:

CVR = [(E-(N/2)) / (N/2)] with E representing the number of judges who rated the item as Moderately Relevant or Highly Relevant and N being the total number of judges.

The mean total of all the means was 3.70 indicating that all of the questions were moderately/highly relevant.

The calculation is as follows:

CVR = [(3-(3/2)) / (3/2)]

CVR = [(3-1.5) /1.5]

CVR = 1.5/1.5

Appendix F

Educational Presentation

REDUCING READMISSION RATES AMONG DIABETIC PATIENTS BY USING TRANSITION OF CARE PROTOCOL

CARE TRANSITION FROM ACUTE TO COMMUNITY SETTING

Appendix G

Chart Audit Tool

Provider documentation and Audit tool	**YES**	**No**	**Comment**
Transition of Care Protocol			
A. Member discharges from acute setting to the community			
I. Did the Case management department receive a notified of acute discharge and discharge paper from the acute setting within 24 hours of diabetic patient discharge?			
ii. Was the discharged patient assigned a case manager the day of discharge notification based on the patient's zip area?			
iii. Did the assigned case manager notify the care coordination manager the same day of the patient's discharge?			
iv. Did the assigned case Manager call the member to introduce self and schedule a post discharge assessment within 72 hours after discharge?			
v. The Care coordination manager assigned a care coordinator to the member within 24 hours of notification?			

vi. Did the assigned case manager and care coordinator meet no later than 48 hours after members discharge to review discharge papers, identify gaps, and discuss possible interventions for already scheduled meeting?			
vii. Did the assigned care coordinator and case manager meet with patients in person, via telehealth or telephonic (based on patients' preference) no later than 72 hours after discharge to complete a post discharge assessment?			
B. During the Post Discharge Assessment call or visit by the care coordinator and case managers will:			
i. Did the case manager address follow up with Primary Care Physician (PCP) is scheduled and there is viable transportation or address any other barriers.			
ii. Was patients' symptoms, diabetic self-management knowledge and skills checked?			
iii. Was education provided and referral made to providers as needed such as dietician, podiatrist, optometrist/ophthalmologist?			
iv. Was the current medication reviewed with the patient and was the new prescription received and reconciled from hospitalization? Identify and rectify any barriers that may exist in filling prescriptions.			

v. Was treating physicians notified of any medication discrepancies?			
vi. Was the patient assisted with completing a health organizer such as name of PCP, address, transportation company, name of pharmacy and date of next appointment?			
vii. Assure that services provided as a condition of discharge such as home health, DME, Diabetic supplies are provided.			
Viii. Diabetic Education Center information was provided to patient and documented			
C. **During the thirty-day monitoring period- Interdisciplinary Care team Methodology**			
i. An interdisciplinary care team (ICT) meeting involving the patient, doctor, caregivers, and providers in the development of care plan that addresses behavioral, social, and multiple healthcare needs was conducted			
ii. 6 weeks short term goals to check if A1C is trending down was set			
iii. Long term goals example to get AIC below was set			
iv. Diabetic self-care education program and community resources was provided?			

v. Identified barriers to care/gaps were addressed, and patient was connected to appropriate providers, community services and resources.			
iv. Case manager reviewed and addressed all short-term goals with patient to determine if they are met within six weeks monitoring period. If unmet, goals are reviewed and revised as needed to continue to meet patient's need to prevent readmission			
D. **After initial six weeks monitoring**			
I. Assigned case manager handed over patient's care management over to assigned care coordinator as the primary owner of the case			
ii. Identify barriers to care/gaps if any and connect the patient with appropriate providers, community services and resources.			
iii. Care coordinator continues to assess member quarterly or sooner if there is a change in condition or per patient's request for care plan review until goal is met			