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Preventing Acute Myocardial Infarction Readmission Rates

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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2019

Abstract

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MS, Molloy College, 2008

BS, Christian Medical College, 1995

Project Submitted in Partial Fulfillment

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Abstract

Unplanned readmissions to the hospital are a problem faced by most health care organizations in the United States; hospitals are penalized for such readmissions. The project site identified high readmission rates for patients who were discharged after acute myocardial infarction (AMI), making careful transition home a necessity for post-AMI patients. The focus of this quality improvement (QI) project was implementation of an early follow-up appointment of AMI patients following discharge. The purpose of this project was to evaluate the effectiveness of changing follow-up appointments for patients with an AMI from 14-30 days to 7-14 days post discharge to reduce unplanned readmission rates. Bandura's self- efficacy theory provided the theoretical framework for this project. An evaluation of the QI project was completed by comparing patient readmission rates 6 months before and 6 months after implementation of the early follow-up appointments. Data analysis demonstrated that the readmission rate was not improved in the first 6 months post QI project implementation. Using the plan-do-check-act process, a multifactorial approach was recommended to refine the QI project and address the system-wide readmission rates. The implications of this project for positive social change include providing early analysis of the readmission QI project, which allowed the hospital to restructure the QI approach and improve the plan for preventing readmission.

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Section 1: Nature of the Project

Introduction

The cost of delivering health care in the United States is the highest in the world (Dieleman, Squires, & Bui, 2017). Health care spending in the United States has increased by $933.5 billion from 1996 to 2013 with it comprising 17.8% of the economy in 2015 (Dieleman et al., 2017). Intensity of in-hospital care, expenses on pharmaceutical drugs, emergency care, population size, and the aging population are some of the causes of the increase in health care expenditures (Scutti, 2017). Hospital readmissions make the situation worse because of the cost involved with 30-day readmissions and no reimbursement policy. Among all the disease conditions, cardiovascular disease is the most expensive medical diagnosis in the United States, and many costs are associated with inpatient admissions (Bumpus et al., 2017; Kim et al., 2018). Approximately 20% of patients admitted for cardiac care are unplanned readmissions to the hospital (Bumpus et al., 2017).

The project site has a higher acute myocardial infarction (AMI) 30-day readmission rate when compared to the national average of AMI readmissions (Island Peer Review Organization, 2017). The cardiology department's QI team at the Doctor of Nursing practice (DNP) project site identified the causes of AMI readmission rates and implemented a QI project in October 2018. The effectiveness of the intervention was evaluated through this DNP project. In Section 1, I will discuss the practice problem, the purpose and nature of the project, and the significance to nursing.

Problem Statement

Hospitals are penalized if their readmission rates exceeded the national average across all the Medicare admissions (Boccoti & Casillas, 2017). The Centers for Medicare and Medicaid Services (CMS) calculates a rate of "excess" readmissions after making some demographic adjustments that link directly to the hospital's readmission penalty, and if the rate of readmissions are high then the penalty goes higher. A recent national sample of 30-day readmissions after inpatient percutaneous coronary intervention (PCI) rates was 12%, which has increased the health care cost by 3% for index hospitalization and 45% higher cumulative costs (Tripathi et al., 2017). According to Island Peer Review Organization (2017), the 30-day readmission rate at the project site for patients discharged post AMI was 21.5%, which was higher than the national average as well as other state hospitals that were only 19.1%. The project site identified delayed follow-ups as one of the causes of readmission of post-AMI patients. This readmission rate resulted in suboptimal patient outcomes and increased costs for the organization. The hospital implemented an early discharge follow-up, a QI initiative to improve outcomes and reduce unreimbursed readmission related costs. This project was implemented to evaluate the effectiveness of the intervention.

Purpose

The purpose of this DNP project was to evaluate the impact of the existing QI program to determine whether it was effective in reducing cardiac readmissions following hospital discharge post-AMI. The practice-focused question was "In adult patients admitted to a tertiary center with acute myocardial infarction, does a follow-up

visit within 7 to 14 days of discharge reduce the 30-day readmission rate when compared with the previous standard of 2 to 4 weeks follow-up visit with a primary cardiologist?"

The original AMI discharge follow-up practice protocol of the project site was to follow up with primary cardiologist in 2 to 4 weeks. Upon a cardiology audit conducted by the QI team at the project site, it was found that the 30-day readmission rates of post-AMI patients were higher than previous years. One of the identified causes was late follow-up or no follow-up after discharge. The QI team also noted that most of the readmissions happened within 14 days. The European Society of Cardiology's tasks force on myocardial revascularization recommended that there should be a follow up in 7 days of PCIs to do a physical examination, evaluate groin site healing, resting electrocardiogram, hemodynamics, routine laboratory testing to check for anemia, and contrast induced nephropathy (Winjns et al., 2010). For AMI patients, lipid panel and liver function should be done in 4 to 6 weeks after an acute event and/or initiation of lipid-lowering therapy to check if lipid goals are achieved and if there is any liver dysfunction noted (Winjns et al., 2010). Further, an outpatient follow-up within 7 days of discharge has shown lower risk of 30-day readmission for AMI patients at risk of heart failure, and if the follow-up is with same physician then the risk is even lower (Tung et al., 2016). Thus, to address high readmission rates, and in conjunction with the literature review, the project site implemented a QI program that included a follow-up visit within 7 to 14 days of discharge from the hospital.

Nature of the Doctoral Project

The location for the DNP project is a tertiary care referral teaching center that provides high risk percutaneous interventions for all coronary artery disease patients and AMI patients. This facility is in a metropolitan area in the Northeastern United States. This project site served the opportunity for me to accomplish my DNP project because of its location and high volume of high-risk patients referred to the center.

The Walden University DNP Manual of QI Evaluation guided this DNP project. Prior to evaluating this QI initiative, a literature review on AMI care and post discharge care was conducted to gain additional insight into the incidence of post AMI readmission and strategies to promote positive outcomes following hospital discharge. I used Walden University Library, Google scholar and Cochrane, ProQuest, CINAHL and PubMed databases. This QI evaluation project was planned based on various professional experiences, learning resources from medical conferences, and research of QI evaluation projects from peer-reviewed journals and books, Centers for Disease Control and Prevention, medicare.gov, and the U.S. Department of Health. The guidelines of European Society of cardiology on myocardial revascularization and their follow-up recommendations were also used as a source of information.

The QI initiative was implemented in October 2018 at the project site, and the discharge follow-up practice protocol of AMI patients were changed from 2 to 4 weeks to 7 to 14 days. To evaluate the outcome of the practice, change of discharge follow-up, I compared readmission rates for 6 months prior to implementation and 6 months post intervention. Following IRB approval, I collected deidentified data from the project site

Tableau database. Readmission rates of preintervention data (April 2018 to September 2018) were compared with the postintervention data (November 2018 to April 2019) to determine whether a reduction in readmission rate was achieved with the implemented intervention.

Significance

The identified practice problem at the project site was a 30-day AMI readmission rate above national benchmark. The high health care costs and the need to prevent unnecessary hospitalization warranted hospitals and providers to find the cause of high readmission rates. Research on ST-elevation myocardial infarction hospitalizations in a nationwide readmission database on 30-day readmission rates indicated that two-thirds of the readmitted patients were admitted within 14 days, suggesting a need for a closer follow-up of these patients post discharge (Kim et al., 2018). At the project site, a change in policy of discharge follow-up of AMI patients was done based on root cause analysis. The project site noted that most of their readmissions had happened within 14 days of discharge. Discharge follow- up of 2 to 4 weeks was changed to 1 to 2 weeks. A QI project evaluation was thought to be necessary to identify whether the implemented intervention was effective.

As a provider, I have a social responsibility to the community as well as the hospital to reduce health care cost. This project was intended to lead to positive social change by examining the efficacy of the current QI project. Findings from the QI project evaluation were used to refine the QI plan. Ongoing evaluation and modification of the QI plan may result in positive social change by decreasing health care costs and

improving post AMI outcomes for patients. Hospital readmission is a preventable outcome for patients and hospitals (Tung et al. 2017). Thus, the impact of positive social change follows Walden's vision for social change, which refers to impacting society and creating benefits for the public through research, professional development, and education (Walden University, 2017). This project resulted in positive social change by providing early data analysis and evaluation needed to refine the organization's QI project.

Summary

Section 1 provided a synopsis of the doctoral project, the nature, the purpose, the significance, and the need for the project evaluation. This QI evaluation project might serve as a resource to other similar hospitals to improve their patient outcomes. Section 2 will provide the literature review of current knowledge about AMI readmissions, conceptual model for the project, significance to nursing practice, and my need in pursing the project related to DNP Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice (American Association of College of Nursing, 2006).

Section 2: Background and Context

Introduction

The purpose of this DNP project was to evaluate the impact of the existing QI program at the project site to determine whether it was effective in reducing cardiac readmissions following hospital discharge post-AMI. I aimed to answer the following question: In adult patients who are admitted to a tertiary center with AMI, does a follow-up visit within 7 days to 14 days of discharge reduce the 30-day readmission rates when compared with the previous standard of 2 to 4 weeks follow-up visit with a primary cardiologist? Current complexity of the health care system calls attention to innovative methods to improve quality of care. The health care system is implementing ongoing changes across all levels to improve quality of care and patient care (White & Dudley-Brown, 2012). This DNP project was guided by theories and models to support the QI initiative and its evaluation process. In Section 2, I discuss the theoretical framework and model used to support this project, evidence-based literature, background of the project, and my role as a DNP student and the project team's role in project development.

Concepts, Model, and Theories

Theoretical Framework

Middle range theories are ideal for practice settings. Middle range theories are more concrete, have a narrow focus, and are closer to day-to-day practices for easier nursing application (Grove, Burns, & Gray, 2013). Middle range theories are also socially and theoretically significant (Fawcett & Garity, 2009). For this project, the self-efficacy theory supported the design and implementation to measure outcomes of a new

intervention for patient care. The self-efficacy theory is applied in post discharge care to assess patients' efficacy and compliance with medications and follow-up appointments.

Self-efficacy theory was derived from Bandura's social learning theory (Bandura, 2012). Bandura introduced the theory as a social learning theory in 1977, which was renamed later as social cognitive theory in 1986 (Bandura, 1986; Pajares, 2004). Bandura developed self-efficacy theory on the idea that people are organized, reflective, regulatory and proactive in their own ways (Pajares, 2004). Bandura (2012) explained four major concepts involved with self-efficacy: mastery of experience, social modeling, social persuasion, and resolution. Mastery of experiences refers to the importance of a person building resilience by overcoming failures (Bandura, 2012). Social modeling is described as individuals comparing themselves with other people who have successfully gone through similar paths. Social persuasion suggests that good social support can help people be forced to believe in their ability. Resolving or resolution occurs through constant self-appraisal. Efficacy can also be increased by building physical and emotional strength, which can improve cognitive, motivational, and decision-making processes (Bandura, 2012).

Purpose of self-efficacy theory. The main purpose of using self-efficacy theory in this DNP project was to assist the patients to believe in their own power to adhere to the discharge instructions, comply with medication regimens, understand the possible symptoms of heart failure post-AMI, and comply with earlier discharge follow-up. This theory supported the practice change in helping a patient's self-efficacy and self-care.

Patient self-efficacy includes follow-up in a timely manner to prevent complications leading to early hospital readmission.

The implications for nursing practice include mastery of experience, social modeling, persuasion, and resolving—all the concepts of self-efficacy theory leading to improved patient performance and self-care. For example, Klompstra, Jaarsma, Stromberg (2018) suggested that self-efficacy and motivation influence physical activity of heart failure patients; higher level of motivation leads to higher level of self-efficacy, leading them to higher level of physical activity. Thus, it is important for nursing staff to motivate patients in achieving self-efficacy to improve adherence to the discharge plan of care.

Conceptual Model

The project site applied the plan-do-check-act (PDCA) model to analyze the practice problem of high AMI readmission rates. PDCA is a practical approach to health care delivery improvement. All the steps of this model were applicable in implementing the practice change at the project site. The PDCA model was initially developed by Shewart in 1820s to plan and direct professional improvement programs (Joshi et al., 2014). In the planning stage, an objective is established. The second stage involves educating and training the staff to carry out the plan, and in the third stage the intervention is checked and analyzed to compare the results with the predictions. Finally, in the act stage, the intervention is continued or repeated with corrections until the goal is met (Joshi et al., 2014).

Recognizing knowledge gaps helps practitioners to improve their service deliveries structures (Richardson, 2010). PDCA involves a cyclic approach to the fundamental component of performance to enhance continued improvement (Joshi et al, 2014). PDCA model and its cyclic approach helped the QI project team at the project site to identify the possible causes and develop a practice change to reduce the readmission rates.

Operational Definitions

Acute myocardial infarction (AMI): AMI is defined by the American College of Cardiology as acute injury to the muscles of the heart with clinical evidence of acute loss of oxygenation to the myocardium, with a rise or fall of cardiac troponin level above 99th percentile of the upper reference limit and with at least one of the following: symptoms of myocardial injury, new ischemic electrocardiogram readings, pathological Q waves, or imaging that shows loss of viable myocardium (Thygesen et al., 2018).

Percutaneous coronary intervention (PCI): PCIs are an invasive medical procedure in which a balloon is used or a stent is placed to open up narrowed or blocked blood vessels of the coronary arteries to bring blood and oxygen to the heart muscle (Hicks et al., 2015).

Hospital readmissions: Hospital readmissions are defined as patients who are coming back to the hospital within 30 days after an acute short stay in the hospital (CMS, 2015).

Self-efficacy: Self-efficacy is defined as an individual's ability to fulfill a task (Bandura, 2012).

Relevance to Nursing Practice

QI is a significant part of nursing practice, as a nurse or a provider can no longer rely on practice experience. According to the Institute of Medicine (2010), nurses should be collaborating with other health care professionals in redesigning health care, and nurses must be leaders in education. Nurses at all levels need to show why they are doing certain practices and must constantly evaluate their practice changes. According to the American Association of College of Nursing (2006), doctorate-prepared nurses are effective in team leadership and lead interprofessional teams. The doctorate program prepares nurses to employ effective communication and collaborative skills to review practice guidelines and health policy as well as analyze complex practice and organizational issues along with intraprofessional and interprofessional teams (American Association of College of Nursing, 2006).

Causes of Early Readmissions

Most 30-day AMI readmissions have not been related to cardiac disorders (Dunlay et al., 2012; Tripati et al., 2017). Over one-third of all readmissions are related to noncardiac problems, which emphasizes the need for adequate primary care after hospital discharge (Kim et al., 2018). For example, Kwok et al. (2017) did a retrospective audit in a large territory hospital in the United Kingdom between 2012 and 2014 and found that the cardiac causes of readmissions were mostly older patients with AMI, stable angina, heart failure, and anemia. Dunlay et al. (2012) also found that among 3,010 patients with AMI (1987 to 2010), 643 patients were rehospitalized within 30 days of discharge, 42.6%

of whom were related to true myocardial infarction with the rest of readmissions unrelated or unclear.

At the project site, AMI patients were either treated with medical management or PCI. Because the project site is a referral center for high risk PCIs, many patients are transferred to the center for PCI. A review of in-patient PCI cases in 722 hospitals across the United States revealed that 1 in 8 patients were readmitted within 30 days of PCI and most of them had low risk chest pain that did not require any intervention (Tripati et al., 2017). Thus, further research is needed to find the true causes and preventable measures for these post-PCI readmissions (Tripati et al., 2017). Additionally, if patients are scheduled for an earlier outpatient follow-up visit, most of the post-AMI or post-PCI issues may be addressed, and readmissions could be prevented.

Further, research has suggested other causes of readmissions. Ngyuen et al. (2018) used electronic health records from AMI patients from 2009 to 2010 among six hospitals in North Texas and noted 13% readmissions within 30 days and found that it increased hospital costs by approximately 50%. Nguyen et al. made an AMI Readmission Risk Score that included 7 measuring points: renal function (serum creatinine > 2mg/dl), elevated brain natriuretic peptide, age per decade >18 years, history of diabetes mellitus, nonmale, no timely PCI, and low systolic blood pressure <100 mm Hg. Based on these measures, high risk patients can be targeted earlier before discharge and can be scheduled for targeted readmission prevention programs (Nguyen et al., 2018); however, the study did not address all possible causes of readmissions. But early identification of the causes can reduce readmission rates.

Although specific studies on true causes of AMI readmissions are still lacking, there was one combined AMI and congestive heart failure readmission study that noted the readmission time period. Tung et al. (2017) in their population-based study of 30-day readmissions of AMI and congestive heart failure patients in Taiwan found that most of the patients were readmitted during the first 14 days of discharge. The project site data showed preventable readmission causes like stable angina, fluid overload, and groin site complications. The project site implemented an early discharge follow up within 7 to 14 days post-AMI. The DNP project intended to evaluate the effectiveness the early discharge follow-up in reducing AMI readmissions.

Interventions to Prevent Readmissions

Early follow-up. Upon extensive literature review on Walden's database and the American Heart Association and American College of Cardiology resources, no strict recommendations on discharge follow up of AMI patients are given by American Heart Association or American College of Cardiology. According to Winjins et al. (2010), European Society of Cardiology's tasks force on myocardial revascularization guidelines recommend that there should be a follow up in 7 days of PCI to do a physical examination – including but not limited to groin site healing, resting electrocardiogram, hemodynamics, routine laboratory testing to check for anemia and contrast induced nephropathy. This practice is being followed by all European countries but not strictly enforced in the United States.

Tung et al. (2017) did a population based study in Taiwan evaluating 30-day readmissions of AMI and congestive heartfailure patients which included 5,008 and

13,577 and noted that a 7-day discharge follow-up of post AMI and congestive heartfailure was found to be effective in reducing readmission rate and a 7 day follow up with same physician was even better in reducing readmission rate according to Taiwan's national health insurance research database. The study did not specifically mention how it reduced readmission rates. Tung et al. did not separate heart failure and AMI patients. The project site had implemented seven to 14 days' post AMI discharge follow up aiming for early recognition of heart failure, contrast induced nephropathy, follow-up on adherence to medication regimen, groin site evaluation and reassurance on minor common ailments post AMI with or without PCI.

Early follow-up post AMI is not well studied in the United States and there is no specific recommendation of post discharge follow-up given by American College of Cardiology or American Heart Association. The 2013 American College of Cardiology and American Heart Association guidelines on post discharge education plan of ST-elevation myocardial infarction patients include medication adherence, timely follow-up, dietary interventions, cardiac rehabilitation, compliance with intervention to prevention and reassessment of arrhythmias and heart failure (O'Gara et al. 2013). European Cardiology Society guidelines recommend early follow-up for post PCI patients. An earlier follow-up evaluation of post AMI patients at the project site is warranted, because PCI's for AMI patients are done at the project site. The project site did 11,931 cases from 2015 to 2017, doing the highest number of PCI's in the state.

Discharge education. According to Hesselink et al. (2014) providers can reduce hospital readmission rates by focusing on discharge information with high quality

information which is coordinated and written as well as communicated with the primary

cardiologist. Discharge care post AMI should include ensuring follow up appointment

prior to discharge, patient-teaching on medication actions and side-effects and

consequences of non-adherence to medications, and education on behavioral and dietary

modifications (Hesselink et al., 2014). Hesselink et al. (2014) further pointed out that the

discharge provider should involve the primary care provider in the discharge plan of care.

The project site instructs the nurses and the providers to provide clear and written

discharge instructions to the patient's and their care takers, including medication

adherence, dietary restrictions, exercise program, visiting nurse services and strict

adherence to follow-up.

     Transition of care program. Marbach et al. (2018), studied the impact of

transition care program for AMI patients to reduce 30-day readmission rates and found

that 18% of readmissions happened in the standard discharge care and there was only

11.8% readmission rate among transition care patients thus showing 48% reduction in 30-

day readmission rates. The DNP project site already has a transition of care co-ordination

program and the nurse from it makes a follow up phone call within 48 hours of discharge

to ask about the hospital stay, recovery phase and medication adherence. Despite having

the transition of care co-ordination program program in place at the project site, the

project site faces the highest volume of AMI readmission rates among the state and it is

noted to be more than the national average (Island Peer Review Organization, 2017).

Local Background and Context

The project site is a 1,134-bed academic medical center in the north eastern United States. The project site is a referral center for AMI patients and complex high-risk PCI patients and has documented positive outcomes for AMI patients, including high marks for the last 20 consecutive years from the State Department of Health for performing high volume and safe PCIs. The readmission data for the year 2017 was noted to be high though the medical center demonstrates high quality and safe care for PCI patients.

Island Peer Review Organization (2017), reported the 30-day readmission rate of AMI patients as 21.5 % which is noted to be higher than the national average of 18% and state average of 19.1%. The QI team at the project site, noted a higher 30-day readmission rates of post AMI patients compared to the previous years. Most of the patients were referred from other hospitals due to the complexity of the patients and the complexity might have contributed to the readmission rates. Patients were sent back to their own primary cardiologists upon discharge, and the recommendation for discharge follow up was 2 to 4 weeks. The project site has a transition of care program, where they make phone calls in 48 hours to check on the patient's medication adherence and discharge follow-up instructions. Despite the meticulous discharge care the project site faced a higher volume of AMI readmissions that warranted the department to do a QI initiative.

The 21st century Cures Act of CMS monitors readmission rates of their patients who have had AMI, congestive heart failure, chronic obstructive pulmonary disease,

pneumonia, coronary artery bypass graft and total knee replacement and total hip

replacement (CMS, 2019). CMS introduced a 'Hospital Readmission Reduction

Program', which is a value-based program where the payment to hospitals with high

reimbursement rates are reduced (CMS, 2019). Hospitals were financially affected

because of the reduced reimbursement programs. CMS expects better outcomes for their

patients. The project site data showed preventable readmission causes like stable angina,

fluid overload, and groin site complications. The project site implemented a change in

discharge follow up from 2 to 4 weeks to 1 to 2 weeks based on the hospital data,

evidence from literature, European Cardiology Society guidelines and the hospital's

feasibility of follow up timeline. The project team consisted of cardiology department

director, two cardiology nurse practitioners and a project manager.

Role of a DNP student

As a cardiology nurse practitioner with extensive cardiology background in

critical care and primary care, I could influence the patients, providers and staff members

in providing optimized care to AMI patients from admission to discharge. My role in this

project was to evaluate the effectiveness of the QI project at the DNP project site, and

eventually formulate a practice protocol if the evaluation of the intervention is deemed

successful. The ongoing relationship between a patient and their health care providers are

called the relative continuity (Valaker et al. 2016). Enhancing relative continuity between

the patient and the primary cardiologist is a way to prevent readmissions. As a provider I

have a responsibility in assessing patient's self-efficacy and communicate the discharge

plan of care with primary cardiologist and schedule a seven to 14 day follow up appointment.

According to American Association of College of Nursing (2006) DNP essentials 7, denotes "clinical prevention and population health for improving the nation's health" (p.15). Nurses are involved in improving and promoting public health, same time evaluate care delivery models in community and environmental health. Health care policy for health care advocacy is another DNP essential and it encourages nurses be leaders in making health care policy that models health care finances, regulation and delivery (American Association of College of Nursing, 2016).

My motivation for completing this project was to improve the outcomes for cardiology patients under my care. My hope was that the QI project would be effective; however, I will have to be objective in my analysis. I did not expect bias to be an issue for this project. The data from before and after the implementation of earlier follow-up cardiology appointments were analyzed objectively using statistical analysis and shared with the project team.

Role of the Project Team

This QI project was implemented under the direction of the cardiology department director. I was working with the cardiology project team to obtain data for readmission rates for 6 months prior to the project implementation and 6 months post implementation. Following IRB approval, I formally requested permission to receive de-identified readmission data and shared my findings with the project team via a face to face presentation. Based on the findings regarding readmission rates, the team of

cardiology providers decided further, to revise the approach, and expand the reach of the QI project to other types of patients in the medical center. I presented the data to the team following data analysis.

Summary

Section 2 provided information which reflects the need to incorporate reasons for earlier physician follow up and the need to reduce hospital readmission rates. The detailed description of self-care efficacy theory and its application to this project along with the PDCA model were introduced and discussed in depth. Supporting literature was discussed and relations were drawn to the project. Section 3 will explain the project design for data collection and analysis.

Section 3: Collection and Analysis of Evidence

Introduction

According to Office of Disease Prevention and Health Promotion (2018), there

were 129.2 coronary heart disease deaths per hundred thousand populations as of 2007,

and the target for 2020 is to reduce deaths to 103.4 per hundred thousand people. The

project site contributes to the public by providing periodic health community programs,

which included addressing high readmission rates following an AMI. My DNP project

was conducted to evaluate the effectiveness of a cardiology QI program that is intended

to reduce readmissions after discharge from the hospital following an AMI. In this

section, I define the project design following the QI manual for secondary data analysis.

Practice-Focused Question

The Hospital Readmissions Reduction Program is a Medicare value-based

purchasing program that reduces payments to hospitals with excess readmissions (CMS,

2019). The Hospital Readmissions Reduction Program supports the national goal of

improving health care for Americans by linking payment to the quality of hospital care,

encouraging many hospitals to take steps to reduce readmissions (CMS, 2019). In the

year preceding the project implementation, the department leaders identified from the

Island Peer Review Organization that the AMI readmissions are higher than national

average. According to the facility's finance team, the hospital is losing money on

readmissions from on the Hospital Readmissions Reduction Program. A project team was

assigned to identity the causes of AMI readmissions, who did a literature review was

done and assessed the causes of the AMI readmissions at the site and implemented a QI

project. The department at the project site did a root cause analysis of the AMI

readmissions through chart reviews and interview with providers, which showed that

most of the patients were admitted within 14 days. Because evaluation is necessary to

measure the outcomes (White et al., 2016), the aim of the DNP project was to evaluate

the practice change implemented at the project site. Thus, the DNP project aimed to

answer the following question: In adult patients who are admitted to a tertiary center with

AMI, does a follow-up visit within 7 days to 14 days of discharge reduce the 30-day

readmission rates when compared with the previous standard of 2 to 4 weeks follow up

visit with a primary cardiologist?

Source of Evidence

For this DNP project I did a literature review using Walden University Library,

Google Scholar and Cochrane, ProQuest, CINAHL and PubMed databases. This QI

evaluation project was planned based on various professional experiences, learning

resources from medical conferences and other QI evaluation projects from peer-reviewed

journals and books, Centers for Disease Control and Prevention, CMS, and the U.S.

Department of Health. I reviewed the recent research from 2010 to 2019 associated with

AMI, PCI, AMI readmissions rates, follow-up care and American College of Cardiology,

American Heart Association, and European guidelines. The relevance and strength of the

literature was analyzed by using the American Nurses Credentialing Center's level of

evidence rating system (Peterson et al., 2014).

The literature showed that the cost of readmissions to the health care system in general is

substantial accounting for 17.4 billion annually by Medicare alone (Kirpalani, 2014). The

Hospital Readmissions Reduction Program, established in the Affordable Care Act, gave authority to Medicare to reduce their reimbursement for hospital readmission (Kirpalani, 2014). The Community-based Care Transitions Program was also created by the Affordable Care Act to improve care transitions from the hospitals to the outpatient settings (Centers for Medicare and Medicaid Services, n. d). The CMS initiative of Community-based Care Transitions Program was introduced in 2011, and by 2012 the project site announced to join the initiative (CMS, n.d).

Further, the 2013 American College of Cardiology and American Heart Association guidelines on post discharge education plan of ST-elevation myocardial infarction patients include medication adherence, timely follow-up, dietary interventions, cardiac rehabilitation, compliance with intervention to prevention and reassessment of arrhythmias and heart failure (O'Gara et al. 2013). European Cardiology Society Guidelines recommend close follow-up for post PCI patients, but does not specify when to follow up (Winjjins et al. 2013; Roffi et al. 2016). Thus, the literature review gave insight to the background of AMI post discharge care.

Additionally, the Island Peer Review Organization is one of 19 other QI organizations that are focused on the national effort to reduce readmission rates. The Island Peer Review Organization (2017) reported the 30-day readmission rate of AMI patients at the project site as 21.5 %, which is higher than the national average of 18% and state average of 19.1%. The cardiology department's QI team at the DNP project site identified the causes of AMI readmission rates and implemented a QI project in October 2018.

The hospital's QI department's data from Tableau database also showed higher AMI readmission rates (17.5%) than 16% of the national average. The chart review results done by the QI department showed that most of the post AMI patients were readmitted in 7 to 14 days. The evidence from the literature and the chart review results suggested that an earlier follow up is needed for the AMI patients. The QI team at the project site changed the practice protocol of AMI patients discharge follow up from 2 to 4 weeks to 7 to 14 days based on evidence in literature and root cause analysis of the DNP site data. After IRB approval I contacted the project manager for the pre and post QI project data. 6 months worth pre- and post-implementation, archival and operational de-identified data was provided to me by the project site's QI department director. I used this data to analyze the effectiveness of the intervention. A control chart using Microsoft Excel was done for this QI evaluation project.

Archival and Operational Data

Island Peer Review Organization (2017), reported the annual 30-day readmission rate of AMI patients at the project site as 21.5 % which is noted to be higher than the national average of 18% and state average of 19.1%. The hospital's QI department's data from Tableau database showed higher AMI readmission rates of 17.5%, which is higher than the 16% national average. The results of Island Peer Review Organization and internal data is noted to be different. The chart review results done by the QI department showed that most of the post AMI patients were readmitted in 7 to 14 days. The quality department did internal chart reviews to find the root causes of AMI readmissions. Data obtained from these chart reviews were entered into a database and tracked by quality

management personnel. The QI department considers these chart reviews and data as a good source of information for internal assessment and implementation of plan of care. Only the QI department has access to these chart reviews and data.

Pre-implementation incidence of AMI readmissions was collected from the QI department with permission from the site administrator. These data were de-identified to protect the privacy of the patients involved in the project. The data was collected by the QI department, 6 months pre and 6 months post implementation. The data was provided on an excel spread sheet and was given in monthly intervals. A control chart was then made to compare the pre and post implementation data to determine if the intended outcome was met.

Protections

Prior to implementing this data analysis, I obtained formal permission from the project site to use their archival data using the letter example from the Walden University's DNP QI Project Manual. I obtained IRB approval from Walden University prior to collecting the data from the project site. After IRB approval was obtained, an evaluation of early discharge follows up was done by assessing the project site data which was collected by the QI director from the hospital's database called Tableau. Data included monthly AMI readmission rates for the 6 months prior to the QI project implementation and 6 months post-implementation.

Analysis and Synthesis

The QI project team at the DNP project site applied the PDCA model to analyze the practice problem of higher 30- day AMI readmission rate. The project site

implemented the proposed intervention in October 2018. I evaluated the data from April

2018 to 6 months post intervention, after the IRB approval. After IRB approval was

obtained, an evaluation of early discharge follow-up was done by assessing the given data

from the hospital's Tableau database. I assessed the AMI readmission rate of 6 months

prior to the project implementations and 6 months post implementation. I also requested

the project manager to get Island Peer Review Organization 2019 up-to-date readmission

data of the project site compared to the state and national data. Island Peer Review

Organization is still unable to analyze the data because of low data points. QI department

must wait another 3 months to get data from Island Peer Review Organization. Analysis

of the project site's internal data was analyzed and presented using a control chart. The

control chart noted monthly readmission rates for 6 months prior to and 6 months after

the intervention of earlier follow-up appointments was implemented.

Summary

The QI initiative was implemented to reduce 30-day readmissions of AMI

patients. The evaluation of the effectiveness of the QI initiative and its process was

explained in Section 3. Successful reduction of unplanned readmissions can reduce

complications and promote good patient outcomes of AMI patients, thus reducing 30-day

readmission rates. Results of the data analysis, findings, implications of care outcomes

and recommendations will be addressed in section four.

Section 4: Findings and Recommendations

Introduction

The problem addressed by the project was the continued high rate of AMI readmissions at the project site. An earlier follow-up post discharge was implemented to improve AMI patients' discharge outcomes. Thus, the practice-focused question for this project was "In adult patients who are admitted to a tertiary center with AMI, does a follow-up visit within 7 days to 14 days of discharge reduce the 30-day readmission rates when compared with the previous standard of 2 to 4 weeks follow up visit with a primary cardiologist?" The purpose for this QI initiative was to reduce readmissions by examining patients earlier, 7 to 14 days of discharge. This section of the paper will report the findings and implications of the analysis of evidence and describe the recommendations. This section will also summarize the contribution of the doctoral project team and the strengths and limitations of the project.

Findings and Implications

The project consisted of revising the follow-up appointments from 2 to 4 weeks to 7 to 14 days post AMI discharge. The earlier follow-up appointment post AMI discharge was implemented in October 2018. The cardiology QI project department at the project site provided me with AMI readmission data from April 2018 to April 2019. The project site uses Tableau database for the data collection and presentation. I compared the preintervention and postintervention data to evaluate the effectiveness of the earlier follow-up appointments on reducing AMI readmission rates. The scores from the Tableau data were entered into an Excel spreadsheet and a control chart was developed (Figures 1

and 2). A list of data by month is provided in Table 1. Microsoft Excel was used to determine the mean, median, and standard deviation for the pre- and post-intervention data (Table 2).

Table 1

Monthly Readmission Rates

	Readmission rate	Total AMI admissions
April 2018	2	38
May 2018	6	54
June 2018	5	32
July 2018	6	58
August 2018	7	48
September 2018	1	38
November 2018	8	56
December 2018	4	40
January 2019	5	52
February 2019	5	60
March 2019	4	48
April 2019	3	62

Table 2

Mean, Median, and Standard Deviation Rates Pre- and Post-Implementation

	Mean	Median	*SD*
April 2018 – September 2018	4.5	5.5	2.42
November 2018 – April 2019	4.83	4.5	1.72

There were eight readmissions in November 2018, which impacted the mean and median readmission rates post implementation. Therefore, continued evaluation of this project is warranted even though significant decreases in readmission rates were not found at 6 months post intervention. It could be that the early follow-up appointments had not made an impact yet.

AMI discharge early follow-up pre- and post-readmission rates are also provided in a control chart (Figure 1) and monthly percentages of readmissions is presented in

Figure 2 for comparison of total admissions and readmissions. A spike in readmission rates occurred in November, which increased the 6-month post implementation rates. Some decrease in readmissions is seen following the November spike, which may be a trend in the right direction, but additional monitoring and analysis is needed to determine if the QI intervention is effective.
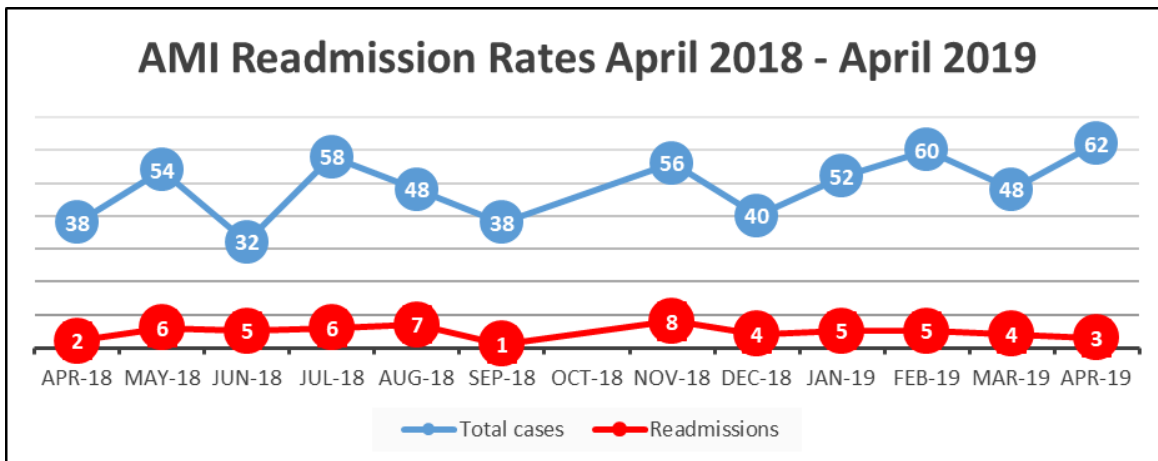
Figure 1. Number of readmissions pre and post QI project implementation. Total admissions for patients with AMI are represented in the top line of this chart. Monthly admissions vary significantly, which is also represented in the total readmissions each month.
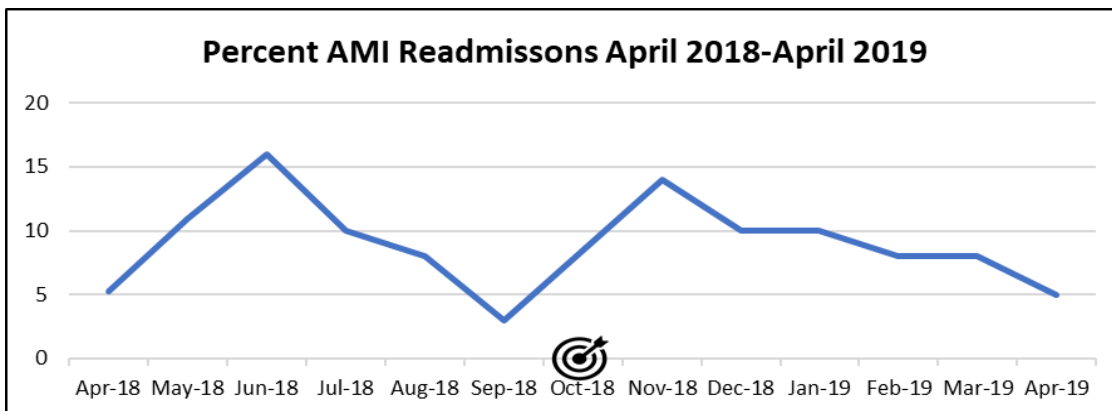

Figure 2. AMI readmission rates by percentage per month.

Findings from this project indicate that early follow up alone did not impact the readmission rate of discharged AMI patients. Additional evaluation of the AMI readmission through chart audits are needed to understand the causes of readmissions to determine a comprehensive multidimensional approach that can be used to refine the QI plan. The project site has decided to continue the early follow up appointments to determine what impact this intervention has on readmission rates at one-year post implementation. My project had a positive social change on the project site by providing early analysis of the existing QI plan, which is the "check" part of the PDCA cycle. Based on analysis of the readmission data the QI plan is being revised to address additional root causes of readmission post AMI discharge.

<div align="center">

Recommendations

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The QI project was designed to reduce AMI readmission rates. An earlier follow up was implemented in anticipation of reducing the readmission rates of patients who are discharged post AMI. Though the intervention did not impact the readmission rate as noted with the present data analysis, the earlier follow up might have helped patients with their long-term goals and outcomes. My recommendation would be to do an in-depth chart review to assess for other gaps and opportunities for improvement in the continuity of post discharge care of patients with an AMI diagnosis. A further recommendation will be to educate all the providers and staff members along with patients, about AMI and the significance of reducing AMI readmissions. Education is a critical component for AMI readmissions, because the provider must reduce the gap in transitioning care from

hospital to home. The ongoing relationship between a patient and their health care

providers are called the relative continuity (Valaker et al. 2016). Enhancing relative

continuity between the patient and the primary cardiologist is a way to prevent

readmissions. Hospital-based providers have to take extra care in including the primary

health care provider in the transition of care.

Contribution of the Doctoral Project Team

The doctoral project team consisted of the cardiology department director and two

nurse practitioners. The team members supported me throughout the data collection and

analysis. They allowed me to lead the evaluation of the QI project and present my

findings at the leadership meeting. Since the early follow up initiative did not impact the

readmission rates, the department has given me the sole responsibility of taking this

project to the next level, including an in-depth chart review, staff education, system wide

data analysis and leading the AMI system wide task force.

Strengths and Limitations of the Project

As the hospital administrators' goal is to reduce readmission rates and avoid CMS

penalties, they are keenly looking for many more methods to reduce readmission rates.

The QI initiative was evaluated after only 6 months, which resulted in small sample size

and data points. A longer analysis period may result in improvement over time. The

strength of the project is that the patients were scheduled to be seen by primary providers

earlier and while it is not a part of the project anecdotal information indicates that the

patient satisfaction was increased due to earlier follow up. The AMI discharge follow up

will continue at 7 to 14 days and the project team will continue to evaluate the impact of

earlier follow up after 12 months data has been collected.

Section 5: Dissemination Plan

The hospital readmission reduction program introduced by CMS has impacted many health care organizations, resulting in lost revenue from unplanned readmissions. The project site was impacted with high readmission rates for patients discharged following an AMI diagnosis. According to the DNP Essential III, DNP prepared nurses use analytic methods to appraise literature and evidence to understand and implement best practice methods (American Association of College of Nursing, 2006). It is also important to disseminate evidence-based practice findings to stakeholders and other health care professionals so that innovations for practice can be applied in other settings to improve health care outcomes (Forsyth et al. 2010). In Section 5, I will be discussing my dissemination plan and self-analysis.

The findings from this project can be presented internally and may be shared externally through podium and poster presentations. I am planning to present my dissemination at the annual national cardiology nurse practitioner conference hosted at the project site under the topic "AMI-preventing readmissions." I already presented my literature review and existing guidelines with proposed interventions of my DNP project at a recent conference, but it did not include my final data. I have already made educational modules to educate providers and staff members on transitioning AMI patients.

Project results were also presented to the stakeholders, the president of the hospital, all the members of the QI department, and the director of the Cardiology Department. Because my DNP project received much attention hospital wide, I have been

asked to lead the AMI readmission prevention task force. Following completion of my DNP project, I did in-depth chart review for the entire health system for the year 2018 for an in-depth analysis of potential strategies for reducing AMI readmission. After the in-depth review, I will be able to analyze more active list data and provide additional recommendations to prevent readmissions of AMI patients.

Analysis of Self

I started the project as a DNP student, but I gained support from my team members and became the team leader of this project with support and trust from leadership. Following the completion of this project, I have been asked to lead in preventing AMI readmissions within the project site on an AMI readmission prevention task force. I pursued my DNP to make a difference in my profession and through this project I was able to work with executive leaders and system wide project managers. I could make a difference in patients' lives when I made sure that they are followed up earlier. The DNP project also helped me grow in my professional role keeping in mind the American Association of College of Nursing (2006) DNP essentials, which were Essential VII and VI used within my project. DNP Essential VII denotes "clinical prevention and population health for improving the nation's health" (p. 15), and this degree has prepared me to evaluate and interpret population-based and environmental information for improving the health of both individuals and communities (American Association of College of Nursing, 2016). DNP Essential VI refers to analyzing and implementing complex practice changes using inter-professional collaboration (American Association of College of Nursing, 2016), which I have done through this project.

Summary

Evaluation of the effectiveness of readmission prevention strategies must be continued. This DNP project was focused on reducing readmission rate by implementing an earlier follow-up, but the QI project evaluation showed that the earlier follow-up did not impact the readmission rates. Therefore, I have recommended additional interventions to improve the existing QI plan. More creative readmission prevention strategies should be implemented to improve the outcomes. As health care reform continues, the hospital readmissions are considered a result of poor health care quality, making it important to invest in readmission prevention strategies.

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