2021

Evaluation of a Cardiac Surgery Nurse Navigator Quality Improvement Program

Eileen Joy Watkins
Walden University

Walden University

College of Nursing

This is to certify that the doctoral study by

Eileen Watkins

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.

Review Committee
Dr. Maria Ojeda, Committee Chairperson, Nursing Faculty
Dr. Anna Valdez, Committee Member, Nursing Faculty
Dr. Anna Hubbard, University Reviewer, Nursing Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2020

Abstract

Evaluation of a Cardiac Surgery Nurse Navigator Quality Improvement Program

by

Eileen Joy Watkins

MSN, Walden University, 2012

BSN, University of the Philippines, 1999

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

February 2021

Abstract

Patients who have had cardiac surgery may experience longer hospital stays and increased readmission rates when there is poor care coordination between patients, families, and the healthcare team. Poor care coordination leads to unclear expectations of each phase of care, decreased compliance with postoperative care regimen resulting in increased length of stay, patient and family dissatisfaction, and increased rates of readmission. This project evaluated a Cardiac Surgery Nurse Navigator (CSNN) Quality Improvement program to address care coordination and improve length of stay and readmission rates for cardiac surgery patients. The goal was to determine whether the CSNN program was effective in reducing the average hospital length of stay and 30-day readmission rates for patients admitted for cardiac surgery. The theoretical framework used to explain the phenomenon was the Meleis' transitions theory. Data regarding length of stay and 30-day readmission rates 12 months prior to and 12 months after the implementation of the CSNN program were collected from the facility's quality improvement department. The results indicated that the length of stay had a slight but nonsignificant decrease post-CSNN implementation, from 7.35 days to 7.03 days. A significant decrease ($p = 0.040$) in 30-day all-cause readmission rates were found, with a rate of 10.53% preimplementation and a rate of 5.85% postimplementation of the project. The results suggest that the CSNN program does decrease readmission rates in the cardiac surgery population and therefore provides financial efficiency for the organization and better compliance with postoperative care regimen for patients, keeping them in optimal health and function within their communities.

Evaluation of a Cardiac Surgery Nurse Navigator Quality Improvement Program

by

Eileen Joy Watkins

MSN, Walden University, 2012

BSN, University of the Philippines, 1999

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

February 2021

Dedication

This doctoral journey was long and fraught with challenges. The fulfillment of this degree is dedicated to my husband, Steve, and my children, Brandon and Emmy, without whose love and support, I would never have gotten to this point. A special dedication to my mom, Remedios, my late dad, Ruben, and my two brothers, Emerson and Alex, whose humble beginnings I have shared with and continue to inspire me to persevere.

Acknowledgments

This work would not be complete without the input of Dr. Maria Ojeda and Dr. Anna Valdez of Walden University. Dr. Ojeda, your encouragement helped see me through many days of developing and redeveloping the prospectus, proposal, and the final project.

An immense outpouring of gratitude to Tracey Sheehan and Jill Melia, who contributed essential material to the paper. A special thanks to my preceptors, whose love of learning and leadership translates into everything they do every single day.

Table of Contents

List of Tables

List of Figures

Section 1: Nature of the Project

Introduction

In the United States, healthcare delivery is a fragmented process that is typically difficult to navigate for patients who have complex health conditions and needs. Patients undergoing cardiac surgery are at risk for many possible complications that could unnecessarily increase their hospital length of stay (LOS) and readmission rates (Bardell, Legare, Buth, Hirsch, & Ali, 2003; Redžek et al., 2015). The nature of the project evaluated an existing Cardiac Surgery Nurse Navigator (CSNN) quality improvement (QI) project. Social change was impacted by evaluating the success of this program and providing recommendations for the future, which may lead to improved patient outcomes and reduced readmissions.

Problem Statement

Patients who undergo major cardiac surgery experience various complications when there is inconsistent communication between patients, families, and the healthcare team (Shadvar et al., 2015). Inconsistent communication and poor care coordination lead to unclear expectations of each phase of care, decreased compliance with post-operative care regimen resulting in increased length of stay, patient and family dissatisfaction, and increased rates of readmission (Bardell et al., 2003; Brooks Winship & Kuzel, 2020; Lee et al., 2011; Litwinowicz et al., 2015; Redžek et al., 2015; Villanueva, Talwar, & Doyle, 2018). According to the Centers for Medicare and Medicaid Services (CMS, 2019), from July 2015 to June 2018, the 30-day readmission rate after coronary artery bypass graft surgery (CABG) was 12.8%. These patients are readmitted within 30 days of discharge

for postoperative complications. Included in the CMS (2019) program for hospital readmissions reduction are six conditions/procedures: acute myocardial infarction (AMI), chronic obstructive pulmonary disease (COPD), heart failure (HF), pneumonia, elective primary total hip arthroplasty and/or total knee arthroplasty (THA/TKA), and CABG. The local setting for the evaluation of the quality improvement project was a Cardiovascular ICU (CVICU) within a Magnet® facility of a large eastern United States health system. The facility had an average of 230 cardiac surgery cases (CABG and open valve repairs) per year. This CVICU received post cardiac surgery patients daily. It was important for this program to have decreased LOS and lower readmission rates because shorter LOS enabled patients to continue their recovery within their own home environment, reduced their risks of hospital-acquired infections, and helped in cost containment for hospitals (Bardell et al., 2003). Lower readmission rates were an indicator of positive clinical outcomes (Akerele et al., 2017). Twelve months prior to the program's implementation in 2015, the facility's LOS in days for patients undergoing cardiac surgery was 7.35 days. At the same facility, cardiac surgery patients also had a readmission rate of 10.5% at that same period (J. Melia, personal communication, December 10, 2018). In 2015, the facility instituted a CSNN program but the effectiveness of the CSNN program was never formally evaluated after its implementation. Evaluation of the CSNN program was significant for nursing practice because it validated the effectiveness of well-coordinated care for patients with complex healthcare needs. It will also provide a formal evaluation of the sustainability of the program with a formal presentation to the new hospital leadership.

Purpose

The gap in nursing practice that this project addressed was the lack of formal evaluation of the QI project with presentation to hospital leadership. The CSNN program was implemented at a specific facility as a quality initiative to improve care coordination for patients who underwent cardiac surgery at the project site, not including those who had left ventricular assist device (LVAD). Although current rates of readmissions at the facility were slightly lower compared to preimplementation rates, the LOS has increased indicating that problems persist. The purpose of the doctoral project was to evaluate the CSNN QI program implemented at this specific facility. The program was implemented with the goal of decreasing cardiac surgery patients' LOS and readmission rates. The program was approved by the then-CVICU medical director. However, there was no formal evaluation of the program or report to the hospital leadership. In addition, the hospital has now undergone a merger with another health system in the past year. The formal evaluation has helped determine whether the effectiveness of the program changed over time. Presentation of the results to the new hospital administration will be valuable for the program to demonstrate their outcomes. There were no specific, targeted goals identified when the program was implemented. The practice-focused questions for this project included:

1. Does the implementation of a CSNN program reduce the average hospital LOS among patients admitted for cardiac surgery measured 12-months postimplementation compared to average hospital LOS 12-months prior to program implementation?

2. Does the implementation of a CSNN program reduce 30-day hospital readmission rates among patients admitted for cardiac surgery measured 12-months postimplementation compared to 30-day hospital readmission rates measured 12-months prior to implementation?

Nature of the Doctoral Project

The sources of evidence that were collected to meet the purpose of this doctoral project was data collected on LOS and readmission rates by the facility's cardiac surgery quality department. Spreadsheets were used to present tabular data on LOS and readmission rates of patients who underwent cardiac surgery and recovered in the CVICU 12 months prior to and 12 months after the quality improvement program implementation. The LOS and readmission rates are presented descriptively as a control chart for comparison by month, beginning 12 months prior to program implementation and ending 12 months after program implementation. Data describing the types of interventions performed by the CSNN since implementation of the QI program are presented in tabular format. The data for the project was obtained from the CSNN and the quality department manager who both agreed to share this information. It was feasible to accomplish the project in this setting. The gap in nursing practice that this project addressed was the lack of formal evaluation of the QI project with presentation to hospital leadership.

Significance

The stakeholders to this project included patients who have undergone cardiac surgery in this facility, their families, cardiac surgery nursing and medical staff, the

CSNN, cardiac rehabilitation department, physical and occupational therapists that worked regularly with cardiac surgery patients, the cardiac services administrator, and hospital leadership. Reducing LOS and readmission rates has implications for positive social change. Such reductions may decrease financial impact on families resulting from loss of income, as well as reduce clinical complications and familial stress. Shorter LOS and lower readmission rates can impact organizations' patient throughput and deliver more cost-effective care (Akerele et al., 2017; Balaban et al., 2017; Dajczman et al., 2013; Di Palo, Patel, Assafin, & Piña, 2017). While the goal of the program was to decrease the LOS and decrease readmission rates, the CSNN contributed to positive social change through better care coordination, enhanced customer connections by building trust with patients and families, assisted with better compliance with post-operative care regimen, and kept patients in optimal health (Dajczman et al., 2013; Gunadi et al., 2015; Hudson et al., 2019). The project is transferable to other similar facilities who are working to reduce LOS and readmission rates. It may help other organizations determine the benefits of implementing a similar program within their facilities. In the section reviewing the literature, there was evidence that nurse navigators affected patient outcomes and this paper contributes to this growing body of evidence.

Summary

The implementation of the CSNN QI program aimed to improve patient outcomes at a specific facility. The targeted outcomes included hospital length of stay after cardiac surgery and readmission rate. There was a need to evaluate the program that was implemented to see if it has met its goal. The method to evaluate the effectiveness of the

program included tabulating LOS and readmission rates data on patients who underwent cardiac surgery and recovered in the CVICU of a specific facility, calculating the average LOS and readmission rates 12 months prior to and 12 months after program implementation, and determining if there was any decrease in the rates for LOS and readmission.

Section 2 of this project restates the practice problem, discusses the concepts and theoretical framework used to inform this project, cites the project's relevance to nursing practice, discusses the existing body of evidence related to the project, and how the role of the DNP student, the CSNN, and the quality department interfaced to present and evaluate the data of the program.

Section 2: Background and Context

Introduction

The practice problem was the increased LOS and higher readmission rates among patients who underwent major cardiac surgery (Hospital quality department, 2014). These problems may be caused by poor care coordination and inconsistent communication between patients, their families, and the healthcare team (J. Melia, personal communication, December 1, 2019; Jeyathevan, Lemonde, & Brathwaite, 2017; Ziaein & Fonarow, 2016). The practice-focused questions for this project included the following:

1. Does the implementation of a CSNN program reduce the average hospital LOS among patients admitted for cardiac surgery measured 12-months post implementation compared to average hospital LOS 12-months prior to program implementation?

2. Does the implementation of a CSNN program reduce 30-day hospital readmission rates among patients admitted for cardiac surgery measured 12-months post-implementation compared to 30-day hospital readmission rates measured 12-months prior to implementation?

The purpose of the project was to address the gap in nursing practice by evaluating the CSNN implemented at a specific facility.

This section covers the concepts and theoretical framework used in this project, discusses the project's relevance to nursing practice, explains the problem as it pertained to the specific facility, introduces the role of the DNP student in relationship to the

project, and discusses the role of the project team that provided the program's data that

assisted in analysis and evaluation of its effectiveness.

Concepts, Models, and Theories

The transitions theory by Meleis (2010) was the theoretical framework used to

inform this project. This theory is a middle range nursing theory that Meleis developed

over a span of 4 decades as she observed human experiences and the ways they transition

from health to acute illness and then to recovery, and how they adapt to caring for

themselves (Meleis, 2010, as cited in McEwen & Wills, 2019) . Meleis posited that

adaptation and coping does not only occur during times of crisis or critical events but is

"a passage from one fairly stable state to another fairly stable state and it is a process

triggered by a change" (Meleis, 2010, as cited in McEwen & Wills, p. 231, 2019).

Transitions are further described by stages, milestones, and turning points, and outline

different processes and outcomes. The main theoretical propositions of the theory provide

a framework that recognizes and supports universal aspects of nursing, reinforce the

nurses' role in supporting emerging identities and life patterns, validates the nurses'

concerns about a changing environment for the patients, and calls for nurses to develop

treatment that is supportive of positive outcomes (McEwen & Wills, 2019). Furthermore,

it provides a framework that guides effective care before, during, and after transition. The

transition experience begins before a critical event and has a variable ending point based

on different factors (Meleis, 2010). Comprehending the variety of responses to change,

promoting smooth facilitation of the experience, and responding to its different phases,

and support the wellbeing prior to, during, and at the conclusion of the triggering event, is

what calls for the use of the transitions theory (Häggstrom, Asplund, & Kristiansen, 2012).

Transition experiences and subsequent responses are defined by their triggers, whether they are developmental, situational, related to health and illness, and organizational (McEwen & Wills, 2019). Developmental transitions pertain to birth, death, becoming a new parent, and becoming an adolescent. Situational transitions refer to role changes such as a new job or a promotion, divorce, or homelessness. Health-illness transitions are those experiences of health changes, going from healthy to acutely ill, undergoing surgery, surgical recovery process, and dealing with chronic illness. Organizational transitions refer to dynamic environmental conditions that may be economic, social, or political in nature (McEwen & Wills, 2019). It is also dependent on whether the person is going through specific stressors or multiple transitions and other experiences they may be having, and the meaning they connect to the transition. Meleis (2010) enumerated personal, community, societal, and global conditions as those factors that may exacerbate or mitigate responses to transition.

Meleis' (2010) transitions theory has two parts. The first part is an intervention made to coordinate and support transition, all while promoting health and wellbeing and mastery of the change. This includes the person's support systems such as significant others and a coordinated care team. The goals at this stage are to define what the person is experiencing at the moment, as well as what the person may expect to experience next by providing skills, coping strategies, psychosocial competencies, and knowledge to manage the transition (Meleis, 2010). The second part is a clear understanding of the

transition experience for the patient and their significant others. Meleis et al. (2000) named four major concepts of the theory: the nature of transitions, conditions of transitions, patterns of response, and nursing therapeutics. The nature of transitions incorporates properties, types, and patterns. Conditions consist of individual, community, and societal. Patterns of response comprise of process and outcome indicators.

One of the preconditions of Meleis' transition theory is that it belongs in the domain of nursing and is considered a central concept of nursing (Bobner, 2017; Meleis et al., 2000). This is because nurses are often involved with patients and families in various stages of transition through the health-illness continuum (Bobner, 2017; Im, 2011). Appropriate nursing interventions can facilitate positive transitions, resulting in positive outcomes (Bobner, 2017; Häggstrom et al., 2012).

Bridges' work on transitions theory (as cited in Rancour, 2008) includes a roadmap to navigate major life changes. His framework has three stages: endings, neutral zone, and beginnings. The endings stage refers to letting go of old roles and relationships and old processes, which may leave patients with a sense of loss. Adjusting psychologically to the loss may impede physical recovery. A major difficulty is when the patient does not let go of the old role due to resistance to relinquish something familiar or having a perpetual attachment to their transitional identity. The neutral zone is the core of the transition process and refers to a time in between the endings and the new beginnings. It is characterized by confusion, unsureness, and anxiety (Rancour, 2008). It lacks structure and often leads to a feeling of being lost. This stage is also where new processes and new roles are created, and where learning what those processes and roles will be. An

emerging identity is also created in this stage. If there is a lack of a well-coordinated

transition, patients may demonstrate instability and insecurity in many areas of their lives

(Dima & Skehill, 2011). New beginnings are the final stage of transition according to

Bridges (2004, as cited in Rancour, 2008). This is characterized by new relationships,

opportunities and new skills, a new direction, and new purpose. According to Bridges'

transition theory, at this stage, nurses are in positions to facilitate patients' explorations of

opportunities and beginnings. This theory is also used historically to assess and intervene

as patients transition in and out of roles when they emerge from their illness experiences

and find substantial meaning in their suffering (Rancour, 2008). Using the concepts from

Bridges' transitions theory may assist nurses in their communication and ways to reduce

patients' anxiety as they move through the stages of transition.

Operational Definitions

Care Coordination: Refers to the complete transfer of information of patients as

they see care from multiple providers (Swan, Conway-Phillips, Haas, & De La Pena,

2019).

Cardiac Surgery: According to the American Heart Association (AHA, 2017),

this is surgery on the heart and/or great vessels performed by cardiac surgeons. Data from

patients with the following cardiac surgical procedures were included in the evaluation of

the program: coronary artery bypass graft, aortic valve repair, aortic valve replacement,

mitral valve repair, and mitral valve replacement. Data from patients without these

diagnoses were excluded.

Length of Stay (LOS): LOS is defined as the number of calendar days a patient stays in the hospital for treatment and is used as a measure of quality of health service (Heys, Rajan, & Blair, 2017).

Readmission Rate: Refers to all-cause hospital readmissions within 30 days of being discharged from the hospital (Strano et al., 2019).

Relevance to Nursing Practice

CMS (2017) described value-based purchasing (VBP) as financial incentives to acute care hospitals based on the quality of care they provide, how closely best clinical practices are followed, and how satisfied patients are in their hospital experiences. Congress approved inpatient VBP with the implementation of the Affordable Care Act in 2010 (Pan, 2017). In January of 2015, Health and Human Services (HHS) Secretary Mathews Burwell released a new Medicare payment reform plan aimed more at VBP program measures and dimensions grouped together into four specific domains: safety, clinical care, efficiency, and patient experience (Pan, 2017). This propelled a large group of health insurers and healthcare systems to form a coalition that pledged to implement value-based payment systems. Currently, the hospital VBP program is designed to increase the quality of care for hospital patients by improving processes that ensure safe patient care, increase the transparency of care quality for consumers, and make patient experience better (CMS, n.d.). Hospitals are rewarded based on the quality of care they provide, and not just the quantity of services provided. Effective care coordination has an impact on quality of care and patient experience, therefore affecting the way hospitals are reimbursed through the VBP program.

Care Coordination & Value-based Purchasing

Over the past 10 years, the focus of much research has been the development of strategies that help providers and organizations to meet the goals of VBP, such as reductions in readmission rates (Gunadi et al., 2015). Care coordination is a successful strategy for ensuring continuity of care among patients transitioning from inpatient care to outpatient care (Kowalkowski, et al, 2019). There is evidence that effective care coordination is important to preventing adverse health outcomes (Miller, et al., 2019), and improving the safety and care of complicated populations (McEvoy, Kennedy, & Davis, 2007). For best results, the literature recommends a robust team approach to care coordination that is directed at eliminating complex barriers to care, providing service improvements where necessary to support transitions, quality discharge planning, reinforcement of processes of communication, and task integration (Heslop, Cranwell, & Burton, 2019; Miller, et al., 2019; Passwater & Itano, 2018).

Care coordination programs have been found to significantly lower readmission rates, improve cost effectiveness, and improve quality of care (Akerele, et al., 2017). The presence of patient navigators is one way of improving care coordination in hospital settings. Patient navigator programs have been linked to improved outcomes among patients with mental illness, heart failure, cancer, COPD, pneumonia, and among older patients (Akerele et al., 2017; Balaban et al., 2017; Dajczman et al., 2013; Di Palo et al., 2017; Gunadi et al., 2015; Lee et al., 2011; Seldon, McDonough, Turner, & Simmons, 2016). Specific outcomes of patient navigator programs include significant improvements in readmission rates, quality of life scores, LOS, anxiety and psychological distress,

satisfaction with their care, hospital utilization, emergency room visits, and net revenue (Balaban et al., 2017; Chillakunnel et al., 2016; Dajczman et al., 2013; Di Palo et al., 2017; Gunadi et al., 2015; Lee et al., 2011; Seldon et al., 2016). In addition, Balaban et al., (2017), found that older patients had significantly lower hospital utilization when exposed to a navigator program compared to younger patients. Yatim et al., (2017) found that patient navigator programs reduce barriers to access to care and improve coordination of care for cancer patients. These findings provide evidence that such programs may be of particular importance to improving outcomes among the most vulnerable populations. Taken together, these studies support the effectiveness of navigator programs at improving a variety of patient outcomes including reductions in hospital readmission rates and LOS. There were no studies found that showed effectiveness of nurse navigators in the cardiac surgery setting.

Patients who undergo cardiac surgery procedures have longer LOS and higher readmission rates than those undergoing other procedures. In 2013, a report from the Healthcare Cost and Utilization Project (H-CUP), sponsored by the Agency for Healthcare Research and Quality (AHRQ) indicated that the average LOS for CABG patients in 2010 was 10.1 days, the 20th highest among all procedures. This figure was projected to remain stable for 2011 and 2012. In addition, the 30-day readmission rate for patients that undergo a CABG procedure was 15.1% and was the 16th most commonly performed procedure (H-CUP Projections, 2013).

The author evaluated whether the CSNN program reduced the LOS and 30-day hospital readmissions. Research indicated that patient navigator programs are effective at

decreasing LOS and/or readmissions among patients with cancer, cardiovascular, respiratory, and infectious conditions (Dajczman et al., 2013; Di Palo et al., 2017; Gunadi et al., 2015; Lee et al., 2011; Sheldon et al., 2016). Shorter LOS and lower readmission rates benefit the organization through more efficient patient throughput, avoidance of loss of revenue, penalties and loss of reputation (Akerele et al., 2017). Members of the community who may benefit from exposure to this type of program are those patients who are about to undergo major heart surgery as well as the clinical personnel and members of the organization where the care will be provided. The results of this evaluation of the CSNN program may also help other organizations determine whether implementing a similar program would bring greater value to the care they provide. The section on sources of evidence provides further details on the literature that supports the nurse navigators' impact on LOS and readmission rates.

Evaluation of the CSNN program provides evidence of the program's effectiveness at improving communication and coordination of care through demonstrated reductions in LOS and 30-day readmission rates among patients who underwent cardiac surgery.

Local Background and Context

This doctoral project evaluated the CSNN program implemented in the CVICU of a large, urban health system in the southeastern region of the United States. This unit had multiple daily admissions of the cardiac surgery population requiring the assistance of the CSNN. The patient population in the unit was mostly the middle to older adult population with a diagnosis of coronary artery disease or heart failure or a type of valve malfunction

that requires surgical intervention (J. Melia, personal communication, December 10, 2018). The population served was mostly from an urban area of a state capital. The hospital served a very diverse ethnic population of African Americans (45%), Caucasians (47%), those of Hispanic ethnicity (5%), and others (3%) (Hospital quality department, 2018). The surrounding city and neighboring counties were low to middle-income class population (QuickFacts, Richmond City, Virginia, 2018.). The hospital's LOS for cardiac surgery patients from May 2014 to April 2015, not including the LVAD population, had an average of 7.35 days. There was no available data comparing LOS among the area hospitals in this specific population. The hospital's readmission rate for cardiac surgery patients from May 2014 to April 2015, not including the LVAD population was 10.5%. Compared to two other hospitals within a 10-mile radius, the readmission rate of the two other hospitals were no different than the national result: 13.2% (CMS, n.d.). Implementation of the CSNN program was done to further improve the quality of care to cardiac surgery patients. CMS (2019) specifically named CABG as one of the six condition/procedure-specific 30-day risk standardized unplanned readmission measures that is part of the Medicare VBP program that penalizes hospitals with excessive readmissions. Improving the quality of care in this specific population may decrease potential CMS penalties from the hospital. The key stakeholders that supported the CSNN program were the heart failure and cardiac surgery physicians and mid-level providers, the CVICU nursing staff, the CVICU medical director, the CVICU nurse director, and the cardiac services administrator. The shared governance structure of the hospital, specifically the nursing quality council that focused on quality-driven processes,

partly influenced the implementation of the CSNN program. The council was interested in the evaluation of the project, specifically if it had met its goal of decreasing readmission rates, decreasing hospital length of stay and improving patient experience.

The CSNN program was implemented in May 2015 through the creation of a position of cardiac surgery nurse navigator. It was led by the then- CVICU medical director and CVICU nurse director. The current CSNN is one of five nurse navigators in the health system. All of the nurse navigators reported directly to their service lines' leadership structure. Through the CSNN program, patients and families had direct contact with a specialized CSNN who coordinates their care as they undergo the different phases of care. Components of the CSNN program included pre-operative teaching, establishing expectations, reinforcing these teachings post operatively through actual practice, such as the use of the incentive spirometer. For this project, a CSNN referred to the nurse serving in the paid position of nurse navigator, one who coordinated care of a specific population that underwent cardiac surgery of some type.

Role of the DNP Student

I am currently a bedside nurse in the CVICU of this specific project site. I worked closely with the CSNN on a daily basis in the care coordination of cardiac surgery patients. I witnessed firsthand the amount of care necessary to affect positive outcomes for cardiac surgery patients and their families. Working in close proximity and frequency with the unit's CSNN, I was able to observe how she communicated with patients, families, providers and staff to provide essential care coordination services such as: made sure they had everything they need for cardiac surgery, reminded them of pre-

operative preparations, ensured that they had follow up appointments for their pre-operative tests and lab work, met them at the office on the day they speak with the cardiac surgery providers, walked them through the CVICU on the night prior to their surgery, talked them through what they should expect to see once their family member has come back into the CVICU in the hours after open heart surgery, rounded with physicians on a daily basis to be updated on care plans, updated families on the plan for the day, helped bedside nurses implement post-operative measures such as using the incentive spirometer, and performing progressive mobility, and coordinated discharge measures with patients and their families.

My role in the doctoral project was the evaluation of the effect of the CSNN program to cardiac surgery patients' LOS and readmission rates. The CSNN role was implemented prior to my employment in the facility and therefore, I was not involved in the assessment of the need, planning, and implementation of the specific CSNN program.

My motivations for the project laid in the fact that cardiac surgery was a high-risk procedure. Helping patients have positive outcomes, seeing them progress out of the CVICU and into the stepdown unit, watching them walk the hallways farther each day, and finally, getting to see them walk out of the door during their discharge, gave a sense of accomplishment. In addition, evaluating the effects of the CSNN program was important for me as a DNP student and nurse leader to gauge the effectiveness of implementing an evidence-based approach to practice.

One potential bias was the fact that I have a close friendship with the CSNN and may therefore tend to have a preconceived belief that her work yields positive outcomes.

To mitigate potential bias, the program was evaluated using only objective data on LOS and readmissions.

Summary

Poor care coordination results in longer lengths of hospital stay and higher rates of readmission. The evidence that nurse navigators positively affected health transitions through better care coordination and more consistent communication highlights the contributions of this nursing role in ensuring positive patient outcomes. This project addressed a gap in practice by evaluating a QI project consisting of the implementation of the CSNN program. The LOS and readmission rates before and after the implementation of the CSNN program were compared among patients who received cardiac surgery at an urban hospital in the southeastern U.S.

Section 3: Collection and Analysis of Evidence

Introduction

As discussed in Section 1, cardiac surgery is a major patient experience that may result in longer hospital stays, increased dissatisfaction, and increased readmission rates when there is inconsistent communication between patients, families, and the healthcare team (Shadvar et al., 2015). Inconsistent communication and poor care coordination lead to unclear expectations of each phase of care, decreased compliance with postoperative care regimen, resulting in increased LOS, patient and family dissatisfaction, and increased rates of readmission (Villanueva, Talwar, & Doyle, 2018). The purpose of the project was to evaluate a QI program designed to address the inconsistent communication and poor care coordination of patients who have undergone major cardiac surgery, not including those who had LVAD. Evaluation of the implementation of a CSNN QI program was important to determine if it decreases patients' LOS and readmission rates.

The specific project site was a CVICU within a large, urban health system located in the northeastern part of the United States. This CVICU had multiple daily admissions of the cardiac surgery population coordinated by a CSNN. The LOS for this CVICU prior to the implementation of the CSNN role was 7.35 days, and the readmission rate was 10.5%. Although the readmission rate and LOS for this specific CVICU was lower than CMS readmission figures for CABG, as well as the AHRQ's readmission rates for CABG patients and LOS, the facility wanted to continue to improve their process (CMS, n.d; J. Melia, personal communication, December 1, 2019).

This section of the study restates the local problem, the gap in practice and the practice-focused questions; it clarifies the purpose and how this approach aligned to the practice-focused question, discusses the sources of evidence used and published outcomes relevant to the project, and describes how the data was collected and analyzed.

Practice-Focused Questions

In Section 1, it was noted that the CSNN program was implemented at a specific facility as a quality initiative to improve care coordination for patients who underwent cardiac surgery at the project site. Prior to the program's implementation in 2015, the facility's average LOS in days for patients undergoing cardiac surgery was 7.35 days. At the same facility, cardiac surgery patients also had a readmission rate of 10.5% at that same period. In comparison, the report from H-CUP in 2013 indicated that the average LOS for CABG patients in 2010 was 10.1 days, and the 30-day readmission rate for patients that undergo a CABG procedure was 15.1% (AHRQ, 2013). The data from CMS from July 2015 to June 2018 showed the 30–day readmission rate after CABG was 12.8% (CMS, 2019).

The aim of this project was to answer the following practice-focused questions:

1. Does the implementation of a CSNN program reduce the average hospital LOS among patients admitted for cardiac surgery measured 12-months post implementation compared to average hospital LOS 12-months prior to program implementation?

2. Does the implementation of a CSNN program reduce 30-day hospital readmission rates among patients admitted for cardiac surgery measured 12-

months post-implementation compared to 30-day hospital readmission rates measured 12-months prior to implementation?

The practice problem of higher readmission rates and longer LOS due to poor care coordination was supported by literature (Akerele et al., 2017; Gunadi et al., 2015; Schell, 2014). The implementation of nurse navigators has been shown to improve patient outcomes by reducing readmissions and decreasing LOS, therefore an evaluation of the effectiveness of CSNN program implemented at this project site was warranted (Akerele et al., 2017; Balaban et al., 2017; Lee et al., 2011; Saltzberg et al., 2018; Schell, 2014; Seldon et al, 2016). The author compared readmission and LOS rates 12 months prior and 12 months after the implementation of the CSNN program. In addition, the following parameters were used to measure interventions delivered by the CSNN and were reported as frequencies: the preoperative contact with patients and making appointments for them to meet the surgeons, preoperative education on progressive mobility for the postoperative phase, preoperative education on the use of the incentive spirometer as well as good nutrition, introducing them to the unit where they will spend their recovery phase, updating the families during the intraoperative phase, reinforcing preoperative education during the postoperative phase, and ensuring they have a follow up appointment with the surgeons, and understand their discharge instructions prior to hospital discharge. The practice-focused questions and the approach or procedural steps addressed the practice problem through a structured step-by-step approach of evaluation of an existing QI initiative aimed at reducing LOS and readmission rates among patients who underwent cardiac surgery.

Sources of Evidence

The practice-focused questions were addressed following the QI Project DNP Manual of Walden University. From the Walden University library, search terms included *nurse navigator, care coordinator, nurse care coordinator,* and *patient navigator*. It also included *transition, transitions theory, value-based purchasing, cardiac surgery, length of stay, readmission rate, integrated care,* and *quality indicators*. In reviewing the literature available on nurse navigators and their impact on patient outcomes, no literature specific to cardiac surgery patients was identified. Therefore, the literature found and reviewed was focused on nurse navigators for heart failure, cancer, pneumonia, and general ICU patients. The information gathered from this search was used to compare the types of interventions found in the published literature to the types of interventions conducted by the CSNN at the local setting. To answer the practice focused questions, data from the project site's hospital quality department was used. The quality department kept data on all patients admitted into the CVICU that underwent coronary artery bypass graft surgery, mitral valve, and/or aortic valve surgery. This data was contained in spreadsheets and had information on the type of cardiac surgery done, LOS, and readmission within 30 days of discharge. Data on types of cardiac surgical procedures that patients underwent was collected to apply inclusion and exclusion criteria. The CSNN for the CVICU, who was an advanced practice nurse (APRN) contributed de-identified data on the number and types of interventions that she provided to patients in the 12 months following implementation of the quality improvement project. I submitted a formal written request to obtain the data from the quality

department upon ethics approval by the Walden University Institutional Review Board. The Walden University Institutional Review Board gave approval to proceed with the QI evaluation, with IRB approval number 07-06-20-0249010.

Archival and Operational Data

The archival quality data that was obtained from the hospital quality department and from the CSNN was the LOS and readmission rates of all cardiac surgery patients, with LVAD patients excluded, admitted to the CVICU from May 2014 to April 2016, who had undergone coronary artery bypass graft and/or cardiac valve surgery.

The data obtained was quantitative data, and it was collected 12 months prior to implementation of the quality improvement project, and 12 months after implementation. The data was collected on a monthly basis. The data from this project evaluated an existing QI program. No interventions were implemented for this project. A de-identified data set was obtained from the hospital's quality department and the CSNN. The DNP candidate who developed this capstone project stored the de-identified data set on her work computer in a password protected file. Any electronic communication with the quality department and the CSNN in relation to patient records occurred within the electronic security provided by the organization's internal communication system and firewall. Upon completion of the DNP capstone project, the data set was stored securely and then will be destroyed after five years. There was no proprietary, sensitive or confidential information that was disclosed in the doctoral project document.

The following strategies were used to obtain data and resources needed to complete the project:

1. The steps to evaluate the QI initiative was initiated.

    a. Examined the scholarly literature on the need for better care coordination among patients recovering from cardiac surgery.

    b. Obtained background information on the development, planning and implementation of the project from key stakeholders within the organization (CSNN, CVICU medical director, CVICU nurse director, quality department personnel, chief nurse executive, cardiac services administrator).

2. Obtained administrative approval to conduct an evaluation of the QI initiative from project site.

3. Upon ethics approval from the Walden University Institutional Review Board:

    a. Contacted the quality department of the facility via email.

    b. Obtained de-identified data 12 months prior to implementation of the QI project and de-identified data 12 months after QI project implementation.

    c. Analyzed the pre/post data and synthesize the results.

    d. Provide a brief summary of the findings to organizational leaders and key stakeholders, including the heart failure and cardiac surgery physicians, mid-level providers, the CVICU nursing staff, the CVICU medical director, the CVICU nurse director, and the cardiac services administrator.

Analysis and Synthesis

The system used for recording, tracking, organizing and analyzing evidence included Microsoft Excel and Statistical Package for the Social Sciences (SPSS) software. Microsoft Excel spreadsheets were used to organize data into tables, and the formula function was used to compute for average LOS and 30-day readmission rates on a monthly basis. SPSS software was used to analyze relationships between the implementation of the CSNN project and the LOS and readmission rates and if the relationships were statistically significant.

A Microsoft Excel spreadsheet reflected data on average LOS and 30-day readmission rates for a period of 12 months prior to implementation (May 2014 to April 2015), and for 12 months after the implementation (May 2015 to April 2016). The average LOS was an integer reflecting number of days, and the readmission rate was the percentage of patients who received cardiac surgery and were readmitted within 30 days post discharge. The difference in average LOS and readmission rates between the two time periods were used to evaluate the CSNN program; a post-implementation decrease in either of the outcome measures were considered an indication of success.

Summary

Evaluating the role of the CSNN was important in establishing evidence of the value of this role to reducing LOS and readmission rates. The data that was collected and analyzed answered the practice-focused questions and clarified the relationship of good care coordination to lower LOS and lower readmission rates. Once this relationship was

established and the quality improvement project had been evaluated, the findings and

recommendations were shared with the leaders of the organization.

Section 4: Findings and Recommendations

Introduction

A CSNN program was implemented at the local facility as a quality initiative to improve care coordination for patients who underwent cardiac surgery. The implementation of the CSNN QI program aimed to improve patient outcomes at the project site, specifically LOS and readmission rates among patients who underwent cardiac surgery at the hospital. The gap in nursing practice that this project addressed was the lack of formal evaluation of the QI project and lack of presentation to hospital leadership. The purpose of the doctoral project was to address the gap in nursing practice by evaluating the CSNN program implemented at the local facility. The practice-focused questions for this project included the following:

1. Does the implementation of a CSNN program reduce the average hospital LOS among patients admitted for cardiac surgery measured 12-months post implementation compared to average hospital LOS 12-months prior to program implementation?

2. Does the implementation of a CSNN program reduce 30-day hospital readmission rates among patients admitted for cardiac surgery measured 12-months post-implementation compared to 30-day hospital readmission rates measured 12-months prior to implementation?

The sources of evidence used to complete this doctoral project included peer reviewed journals found in the Walden University Library, data from the project site's quality department, and from the CSNN program. Data was obtained on the LOS and

readmission rates of all patients who underwent CABG and open valve repairs and replacements at the facility from May 2014 to April 2015 prior to the initiation of QI initiative, and on LOS and readmission rates between May 2015 to April 2016, after the implementation of the QI project to determine its effectiveness.

The data was obtained from the quality department as a Microsoft Excel file containing the following information: a count of all CVICU patients who have had CABG and open valve surgery from May 2014 to April 2016, the LOS for each month expressed in days, and readmission rates expressed as a percentage. The average LOS and readmission rate 12 months prior to QI implementation and 12 months after implementation were calculated; a graph of a monthly description of LOS and readmission rates before and after the implementation of the CSNN program was created for the purpose of comparison, and a paired t test was conducted to determine the statistical significance of the results.

Data on the interventions delivered by the CSNN was also obtained from the project site's CSNN. The following parameters were used to measure the interventions delivered by the CSNN, each occurrence was counted and expressed as a frequency:

- Establish preoperative contact with the patients and setting appointments to meet the surgeons.
- Provide preoperative education on progressive mobility necessary in the postoperative phase of recovery.
- Provide preoperative education on incentive spirometer use and the importance of good nutrition for the healing process.

- Provide an introduction to the unit, either by walking them in to CVICU and doing verbal introductions with the staff as able, or by describing the unit to the patient and walking the family in to the CVICU if the patient is incapacitated or somehow unable to walk and visit the unit themselves. If they are already in the CVICU due to a critical reason, this parameter is bypassed by the CSNN.

- Provide updates to the family in the surgical waiting area during the intraoperative phase.

- Reinforce preoperative education during the postoperative recovery phase.

- Ensure that patients have a follow up appointment with the surgeon in 1 month and a good understanding of their discharge instructions prior to discharge.

Findings and Implications

Published Evidence on Nurse Navigator Role and Effectiveness

No literature was found on the role of nurse navigators in the cardiac surgery setting. Therefore, as stated in Section 3, the published evidence on the role of nurse navigators and their effectiveness in reducing LOS and readmission rates was conducted to provide a basis for interpretation of the findings of this doctoral project. Through the Walden University library, a search of the databases of Medline, CINAHL, Ovid and PubMed from the years 2007 to 2020 resulted in 35 articles about nurse navigators or care coordination. One referred to a *patient navigator* that was a community health worker but nonetheless assisted patients in transitioning home after hospitalization (see Balaban et al., 2014). The articles focused on the team care coordination approach (see Akerele et al., 2017; Bouras & Barrett, 2007; Di Palo et al., 2017; Gunadi et al., 2015;

Saltzberg et al., 2018; Toivo et al., 2019;), physicians as care coordinators (see Stumm et al., 2019), and nurses as care coordinators (see Kripalani et al., 2019; McEvoy, et al., 2007; Nembhard et al., 2020; Passwater & Itano, 2018; Singh-Carlson, Wong, Trevillion, & Reynolds, 2018), care coordinators specific to oncology (see Passwater & Itano, 2018; Shin, et al., 2020; Singh-Carlson et al., 2018), and social workers in the care coordinator role (see Miller et al., 2019). The articles described nurse navigators in the settings for oncology (see Cantril, Christensen, & Moore, 2019; Loiselle et al., 2020; Passwater & Itano, 2018; Yatim et al., 2017), including those specific to breast cancer (see Chillakunnel et al., 2016; Singh-Carlson et al., 2018), psychiatry (see Akerele et al., 2017), pulmonary (see Balaban et al., 2015; Dajczman et al., 2013), orthopedic surgery (see Phillips et al., 2019), colorectal surgery (see DeGrace, 2018; Bordonada et al., 2020), outpatient and transitional care services (see Kripalani et al., 2019; Miller et al., 2019; McMurray et al., 2018), acute care (see Gordon et al., 2018; Hannan-Jones, Young, Mitchell, & Mutch, 2019; Kripalani et al., 2019), emergency department (see Fulbrook et al., 2017), heart failure (see Balaban et al., 2015; DiPalo et al., 2017; Gunadi et al., 2015; Saltzberg et al., 2018; Schell, 2014), sepsis (see Kowalkowski et al., 2019) and pneumonia (see Seldon et al., 2016).

The successful interventions described in these articles included communication about the plan of care (see DeGrace, 2018; Kripalani et al., 2019; Loiselle et al., 2020; Nembhard et al., 2020;Phillips et al., 2019; Shin et al., 2020; Stumm et al., 201), coordinating resources prior to discharge (see Akerele et al., 2017; Loiselle et al., 2020; Phillips et al., 2019; Saltzberg et al., 2018), ensuring there are follow up appointments

(seeAkerele et al., 2017; Balaban et al., 2017; DeGrace, 2018; Di Palo et al., 2017),

medication reconciliation (see Balaban et al., 2017; Di Palo et al., 2017; Gunadi et al.,

2015; Kowalkowski et al., 2019; Schell, 2014; Toivo et al., 2019), telephone counseling

and contact after discharge (see Balaban et al., 2015; Cantril et al., 2019;Chilakunnel,

2016; Dajczman et al., 2013; DeGrace, 2018; Heritage et al., 2020; Kowalkowski et al.,

2019; Kripalani et al., 2019; Yatim et al., 2017), assessment of and addressing barriers to

accessing care (see Balaban et al., 2017; Gordon et al., 2018; Loiselle et al., 2020;

Passwater & Itano, 2018; Saltzberg, et al., 2018; Stumm et al., 2019), enhancing the

patient experience through effective patient education and team communication (see

Bordonada et al., 2020; Bouras & Barrett, 2007; Dajczman et al., 2013; Di Palo et al.,

2017; Loiselle et al., 2020; Phillips et al., 2019; Schell, 2014; Seldon et al., 2018; Stumm

et al., 2019;Yatim et al., 2017), and supporting patients and family members through their

accessibility and availability (see Akerele et al., 2017; Dajczman et al., 2013; DeGrace,

2018; Hudson et al., 2019; Loiselle et al., 2020; McMurray et al., 2018; Phillips et al.,

2019; Shin et al., 2020;Yatim et al., 2017). Twenty-seven out of the 35 articles

documented positive outcomes including decreased LOS (see Dajczman et al., 2013;

Kripalani et al., 2011; Lee et al., 2011; Phillips et al., 2019; Seldon et al., 2016),

decreased odds of readmissions (see Akerele et al., 2017; Dajczman et al., 2013;

Kripalani et al., 2019), lower readmission rates (see Akerele et al., 2017; Dajczman et al.,

2013; Di Palo et al., 2017; Gunadi et al., 2015; McEvoy et al., 2007; Phillips et al., 2019;

Saltzberg et al., 2018), lower ED visits (see Balaban et al., 2017; Dajczman et al., 2013),

increased compliance with disease-specific core measures (see Dajczman et al., 2013; Di

Palo et al., 2017; Gunadi et al., 2015; Seldon et al., 2016), improved quality of life for cancer patients (see Lee et al., 2011; Loiselle et al., 2020; McEvoy et al., 2007; Passwater & Itano, 2018), and increased patient satisfaction and care experiences when under the care of a nurse navigator or care coordinator (see Bordonada et al., 2020; Bouras & Barrett, 2007; Gordon et al., 2018; Gunadi et al., 2015; Hudson et al., 2019; Lee et al., 2011; Loiselle et al., 2020; McMurray et al., 2018; Nembhard et al., 2020).

The CSNN and Patient Outcomes

Twelve months of data on average LOS and all-cause 30-day readmission rates prior to the QI program was compared to 12 months of the same type of data after the implementation of the quality initiative.

Effect of CSNN program on length of stay. Figure 1 depicted the monthly data on the average LOS for patients who have undergone cardiac surgery at the project site, 12 months prior to and 12 months after the implementation of the CSNN quality improvement program.
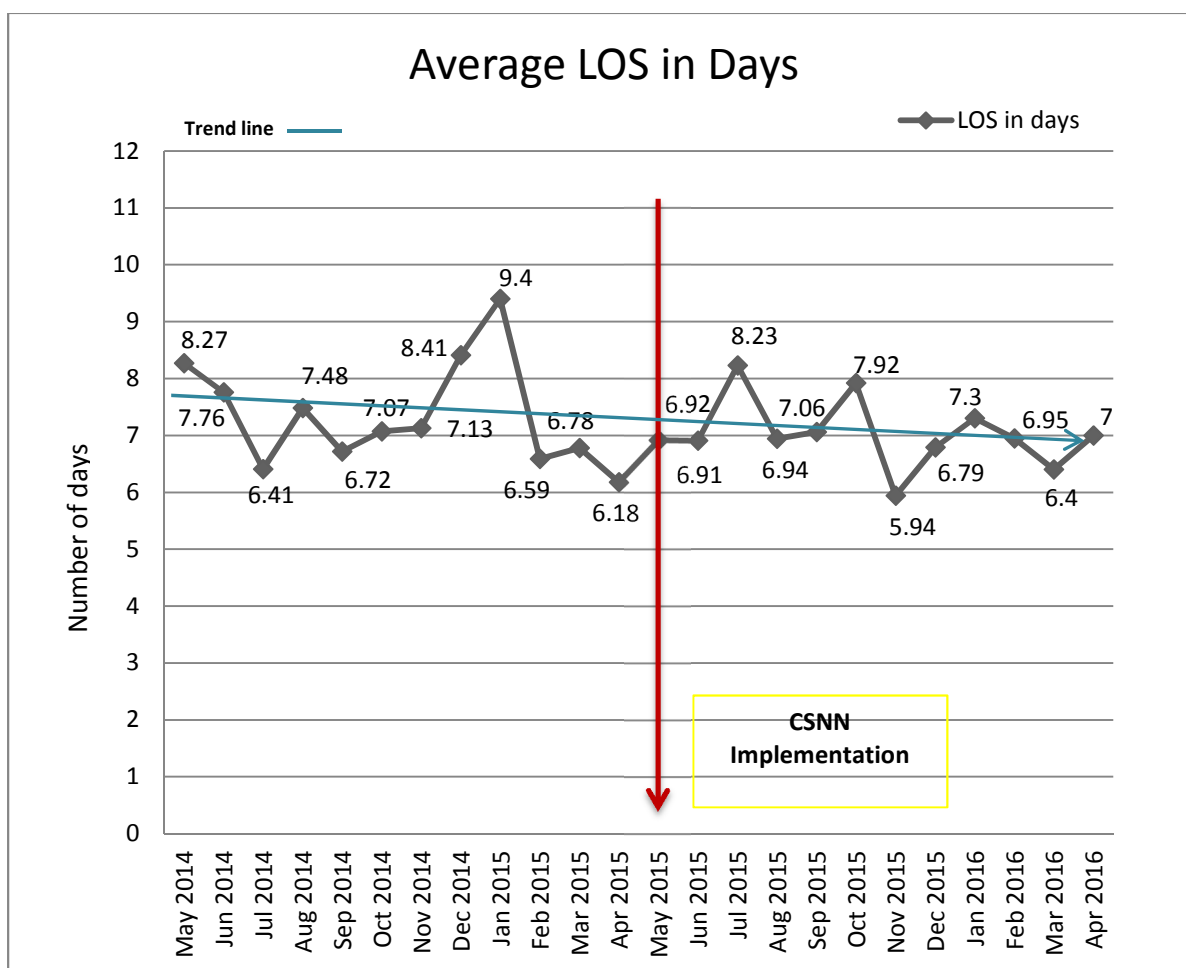
Average LOS in Days

Trend line ——   ◆—LOS in days

Figure 1. Monthly trend of patients' average LOS in days 12 months prior to and 12 months after quality initiative was implemented.

The average LOS prior to the implementation of the CSNN program was 7.35 days (*n*= 12, *SD*= .96). The average LOS after CSNN implementation was 7.03 days (*n*=12, *SD*= .60). A paired *t* test was performed to compare group means for LOS. The results indicated that there was no statistically significant difference in the average monthly LOS when compared before and after the implementation of the CSNN program (*t* (11)= .944, *p*= .365). The variations in LOS were from 5.94 days to 8.27 days with two

data points falling above that trend. The slight decrease in LOS did not provide a definitive answer to the first practice-focused question that the CSNN program does reduce the average LOS for the cardiac surgery population.

The trend towards decreasing LOS is consistent with the published literature which indicates that nurse navigator programs have decreased hospital LOS in patients with COPD, sepsis, those admitted in general acute care hospitalizations, oncology, and pneumonia (see Dajczman et al., 2013; Kripalani et al., 2019; Lee et al, 2011; Seldon et al., 2016). There are also studies published that did not have any decrease in LOS (see Bordonada et al., 2020; Gordon et al., 2018). My study demonstrated a small trend in decreased LOS with the new CSNN program. In the early stages of implementation, the new CSNN program possibly required changes to some of the CSNN interventions to increase its impact to cardiac surgery patients' LOS over time.

Effect of the CSNN program on readmission rates. Figure 2 depicted the 30-day readmission rates in the 12 months prior and 12 months after the implementation of the CSNN quality improvement program.
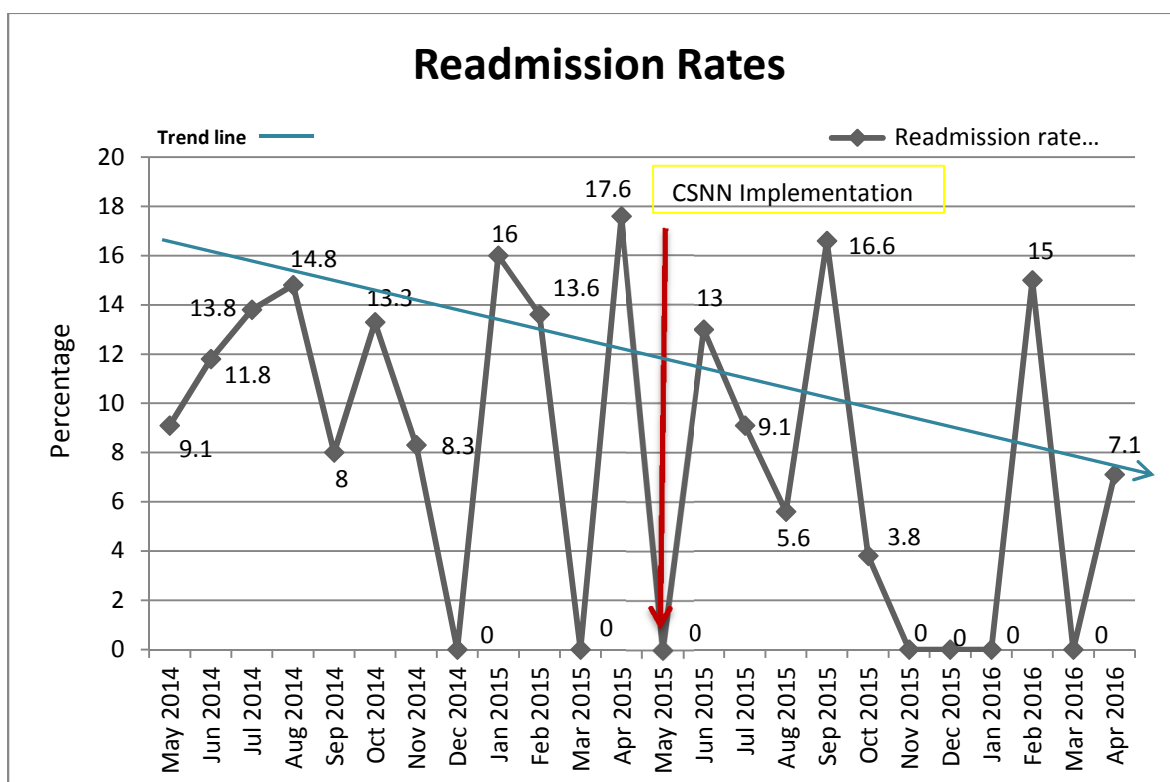
Readmission Rates

Figure 2. Readmission rates 12 months prior and 12 months after quality improvement was implemented.

The average 30-day readmission rate prior to CSNN implementation was 10.53% (n= 12, SD= 5.74). The average 30-day readmission rate after CSNN implementation was 5.85% (n= 12, SD= 6.31). The results of the paired t test indicated that there was a statistically significant difference in the average 30-day readmission rate when compared before and after the implementation of the CSNN program (t (11) = 2.333, p= .040). The graph also shows large variations in the readmission rates from month to month. For instance, prior to CSNN implementation, the readmission rate in November 2014 was 8.3%, 0% in December 2014, and 16% in the following month of January 2015. Similar variations also occurred after CSNN implementation. In August 2015, the readmission

rate was 5.6%, September 2015 saw a sharp increase to 16.6%, and October 2015 was

3.8%. Readmission rate is the percentage of patients who received cardiac surgery and

were readmitted within 30 days post discharge. The rate is partially dependent on the

number of cardiac surgery patients admitted for the month. Therefore the rate may be

higher during months of smaller cardiac surgery patient admissions. However, because

the data gathered did not include the number of cardiac surgery patients admitted for each

month, the reason for these variations could not be defined conclusively. I could only

surmise that these variations are most likely a due to seasonal fluctuations in cardiac

surgery patient admissions and sicker cardiac surgery patients being readmitted for

multiple procedural needs.

Lower readmission rates in the cardiac surgery population after nurse navigator

implementation is congruent with the published outcomes of patients admitted with

psychiatric issues, COPD, heart failure (Akerele et al., 2017; Dajczman et al., 2013;

DiPalo et al., 2017; Saltzberg et al., 2018). This implies that the nurse navigator role in

various specialties has a positive effect on this specific measure. The 30-day all-cause

readmission rates for this project decreased by almost 50% which supports the

significance of this role in the cardiac surgery population. The lower readmission rates

during CSNN program implementation indicates the effectiveness of the specific CSNN

interventions that were implemented. This outcome also gives this organization a good

reputation for cardiac surgery care within the community. In addition, it supports and

justifies the role of the CSNN in decreasing readmission.

Description of CSNN interventions. Table 1 contains the interventions performed by the CSNN during the implementation of this specific quality improvement project, as part of her role. These interventions were performed on a total of 211 patients from May 2015 to April 2016.

Table 1.

CSNN Interventions During QI Implementation (N = 211)

CSNN Interventions	Frequency intervention completed *n*
1. Preoperative contact and facilitate meeting surgeon	211
2. Preoperative education: Progressive mobility	209
3. Preoperative education: Incentive spirometer and good nutrition	209
4. Introduction to the unit	206
5. Provide intraoperative update to family	211
6. Reinforce preoperative education in postop phase	211
7. Ensure follow up appointment and understood discharge instructions	211

The CSNN's primary function is the overall coordination of care of all the cardiac surgery patients at this specific facility. She is present from the preoperative, intra operative, postoperative and discharge and follow up phases of care with the main goal of improving clinical outcomes and processes. The CSNN's performance during the QI

implementation was consistent and followed all of the job functions enumerated in her

job description. She was able to perform interventions 1, 5, 6, and 7 for all 211 patients

during the specific time period. She was not able to perform interventions 2, 3, and 4 on

all patients due to some of them being admitted over a weekend, or already admitted in

the unit and therefore did not need intervention 4. The CSNN's interventions are very

similar to care coordinator and navigator interventions published in the literature.

Activities such as in-hospital daily contact with patients and families, patient and family

education, facilitating meetings with physicians, communicating the plan of care,

assisting with discharge needs, ensuring that discharge medications are understood, are

all interventions in the literature congruent with the CSNN interventions in this QI

project (see Akerele, et al., 2017; Balaban et al., 2016; Chilakunnel et al., 2016;

Dajczman, et al, 2013; DeGrace, 2018; DiPalo et al., 2017; Gordon et al., 2018; Gunadi

et al., 2019; Hannan-Jones et al., 2019; Jeyathevan et al., 2017; Kripalani et al., 2019;

Lee, et al, 2011; Loiselle et al., 2020; McMurray et al., 2018; Phillips, et al., 2019;

Seldon et al., 2016.)

There was a strong outcome in reducing 30-day all-cause readmissions but only a

slight trend towards improvement for LOS. These positive outcomes are supported by the

literature describing the role of nurse navigator/care coordinator/patient navigator in the

fields of oncology, heart failure, psychiatry, ED, surgery, and those treating COPD,

sepsis and pneumonia (Akerele, et al., 2017; Dajczman et al., 2013; DiPalo et al., 017;

Fulbrook, et al., 2017; Kripalani et al., 2019; Lee et al., 2011; Saltzberg et al., 2018;

Seldon et al., 2016). The results of this quality initiative may be transferable to

organizations with cardiac surgery programs that are exploring methods to decrease their readmission rates and LOS.

Unanticipated Limitations

The quality improvement department indicated to me that they excluded data on patients who have undergone emergency cardiac surgery over the weekend. This is because the emergent nature of the situation would have precluded the CSNN from performing the QI interventions that could potentially affect their LOS and readmission rate.

Social Change Implications

The reduction in readmission rates and decreased LOS has implications for positive social change. Reduction of readmission rates improves the cost effectiveness of healthcare by avoiding reimbursement penalties from CMS, reduces the impact of healthcare costs to families as a result of loss of income, decreases the risk of complications and familial stress (Akerele et al., 2017; CMS, 2019; DiPalo et al., 2017). With the cardiac surgery nurse navigator program, hospital LOS could be reduced. Shorter LOS increases a hospital's efficiency and patient throughput and lower the risk of complications (Dajczman et al., 2013; Lee et al., 2011). The CSNN program may contribute positively through better care coordination, building relationships and trust, assistance with cardiac surgery recovery through increased compliance with post-operative therapies, and encouraging partnerships with patients on managing their conditions effectively at home (Akerele et al., 2017; Dajczman et al., 2013).

Recommendations

This project demonstrated minimal decrease in LOS. Because the interventions are performed in a bundle, it was fairly difficult to associate which of the interventions could improve LOS. It may be necessary to look at demographics of cardiac surgery patients, such as age, gender, and comorbidities to determine if the CSNN program is more effective in lowering LOS among some patients as opposed to others. Some studies use discharge follow up phone calls as part of their nurse navigator interventions (Akerele et al., 2017; Chilakunnel et al., 2016; DeGrace, 2018). This may be added to the CSNN interventions to determine if it helps decrease LOS. Based upon the results of this project, I recommend continued tracking of readmission rates and LOS of the cardiac surgery patients in this facility to determine if the CSNN quality improvement program is sustaining its outcomes. This will give the CSNN QI program the opportunity to improve on, add or remove certain interventions as they trend and compare the data on a monthly and annual basis.

Strengths and Limitations of the Project

There were several strengths to this doctoral project. The data that was collected prior to and after implementation of the QI initiative was readily available from the quality department. The CSNN has remained in her role and was an excellent source of background information of how the QI project was envisioned from the beginning. Limitations included the inability to access several of the originators of the project due to the turnover of staff, specifically the CVICU medical director, and the CVICU nurse director who spearheaded the project.

Recommendations for future projects include implementing a nurse navigator in other facilities with similar cardiac surgery programs who are looking to decrease their LOS and readmission rates. Another recommendation is to evaluate the impact of the CSNN program on patient satisfaction scores. Several studies have documented positive patient experiences and increase patient satisfaction with care (Lee et al., 2011; Loiselle et al., 2020). This finding reflects the positive impact that coordinated care has on patient satisfaction. High patient satisfaction scores increase the credibility of an organization, and are tied, in part, to the way they are reimbursed by Medicare (CMS, n.d.).

Section 5: Dissemination Plan

The findings of this doctoral project will be disseminated through the organization's Magnet® coordinator, who will receive a copy of the study results, as well as the cardiac services administrator, the chief nurse executive and the chief executive officer of the facility. The results of this evaluation will also be presented at the facility's annual Nursing Symposium where studies and projects are presented to the nursing body. On a regional scale, I plan to submit an abstract to share the findings of this doctoral project to be presented at the biannual conference held by the Virginia Nurses Association in the form of a poster presentation.

Analysis of Self

I started out this project with many doubts in my ability as a scholar. My self-doubt at scholarly writing emerged many times during this period. Reflecting on my journey as a doctoral-prepared practitioner and leader, I searched for goals that would enable me to use all that I have learned in the DNP program. Questions of "Should I apply for a nurse manager job or as a professor at a nearby university?" and "Will I be a good enough manager or teacher?" played out in my mind. The process of completing this doctoral project helped me in overcoming my self-doubts as a scholar as I learned the various methods of scholarly writing by using the university's resources, such as the Writing Center. Also, receiving consistent feedback from my committee chair and second member helped me fully understand the intentions behind their feedback and gave me in confidence in becoming a scholar. As a project manager, I was very apprehensive at having to contact IRBs to get the project approved. While I worked to obtain IRB

approval, it was helpful that my committee chair was on hand to coach me in what terms to use as well as to avoid. It was also helpful that the IRB team was kind and prompt with their response. As the project began to take shape, and the format of the project started to make sense, the guidance of my chair and committee member became clearer. The experience of having to persevere despite the many obstacles is directly related to how I need to pursue my long-term professional goals. My long-term goals include using my doctorate degree in nursing leadership roles to advocate for quality care and implement evidence-based changes to healthcare delivery. The development of this doctoral project underwent many corrections, and I likened it to the rejections experienced as a leader. I call them course-corrections.

It took me 2 years to complete the DNP coursework and the project. The challenges of being in school full time, being employed full time, and running a household full time was too much to bear on many days. I found that organizing the courses, taking it a week at a time, and mapping out a full school year calendar all helped me cope and keep up with the work. One of the best compliments I have ever received was from a young co-worker who asked if I was still in school. I answered yes. She said, "I keep forgetting that you are in school, because you just never talk about it or complain about it".

Summary

The role of the nurse navigator in the cardiac surgery setting is essential in coordinating care for patients who are undergoing cardiac surgery. It has important implications for organizations that hope to decrease healthcare costs while providing high

quality cardiac surgery care to patients. Good cardiac surgery care coordination requires a dedicated nurse navigator that can facilitate patient-centered care and allow better connections with patients as they transition from one health state to another. The CSNN initiative promotes positive patient outcomes among patients with complex healthcare needs. These outcomes include reduction in hospital LOS and readmission rates, which are significant in improving hospital utilization, organizational efficiency, and quality of care delivered, patient throughput, and patient's quality of life.

References

Adams, E.E., & Wrightson, M.L. (2018). Quality of life with an LVAD: A

misunderstood concept. *Heart and Lung, 47*(2018), 177-183.

doi:10.1016/j.hrtlng.2018.02.003

Agency for Healthcare Research and Quality. (2013). H-CUP Projections: Cardiovascular

/Cerebrovascular conditions and procedures 2001 to 2012. Retrieved from

https://www.ahrq.gov/data/hcup/index.html

Akerele, E., Lim, C., Olupona, T., Ojo, O., Co, N., & Lim, J.J. (2017). Reducing

readmission rates in inpatient settings. *International Journal of Mental Health,

46*(3), 168-176. doi:10.1080/00207411.2017.1295782

American Association of Colleges of Nursing. (2006). *The essentials of doctoral

education for advanced nursing practice*. Retrieved

from http://www.aacn.nche.edu/publications/position/DNPEssentials.pdf

American Heart Association. (2017). Cardiac procedures and surgeries. Retrieved from

https://www.heart.org/en/health-topics/heart-attack/treatment-of-a-heart-

attack/cardiac-procedures-and-surgeries

Balaban, R. B., Galbraith, A. A., Burns, M. E., Vialle-Valentin, C. E., Larochelle, M. R.,

& Ross-Degnan, D. (2015). A patient navigator intervention to reduce hospital

readmissions among high-risk safety-net patients: A randomized controlled trial.

Journal of General Internal Medicine, 30(7), 907-915. doi:10.1007/s11606-015-

3185-x

Balaban, R. B., Zhang, F., Vialle-Valentin, C. E., Galbraith, A. A., Burns, M. E.,

Larochelle, M. R…. Ross-Degnan, D. (2017). Impact of a patient navigator program on hospital-based and outpatient utilization over 180 days in a safety-net health system. *Journal of General Internal Medicine, 32*(9), 981-989. doi:10.1007/s11606-017-4074-2

Bardell, T., Legare, J. F., Buth, K. J., Hirsch, G. M., & Ali, I. S. (2003). ICU readmission after cardiac surgery. *European Journal of Cardio-Thoracic Surgery, 23*, 354-359. doi:10.1016/S1010-7940(02)00767-4

Benetis, R., Širvinskas, E., Kumpaitiene, B., & Kinduris, Š. (2013). A case-control study of readmission to the intensive care unit after cardiac surgery. *Medical Science Monitor, 19*, 148-152. doi:10.12659/MSM.883814

Bobner, K. (2017). Theory description, critical reflection, and theory evaluation of the transitions theory of Meleis et al according to Chinn and Kramer (2011). *Advances in Nursing Science, 40*(3), E1-E19. doi:10.1097/ANS.0000000000000152

Bordonada, K., Davo-Otomo, S., Zucker, M. E., & Saito, H. (2020). The impact of the nurse navigator on patients on a colorectal surgery pathway. *MedSurg Nursing, 29*(2), 109-116. http://www.medsurgnursing.net/cgi-bin/WebObjects/MSNJournal.woa/wa/viewSection?s_id=1073744514

Bouras, C., & Barrett, C. (2007). Strategies to enhance patient-centred care in a cardiothoracic surgical unit. *Practical Development in Health Care, 6*(3), 150-164. doi:10.1002/pdh.224

Brooks, E. M., Winship, J. M., & Kuzel, A. J. (2020). A "behind-the-scenes" look at

interprofessional care coordination: How person-centered care in safety-net health system complex care clinics produce better outcomes. *International Journal of Integrated Care, 20*(2), 1-10. doi:10.5334/ijic.4734

Cantril, C., Christensen, D., & Moore, E. (2019). Standardizing roles: Evaluating oncology nurse navigator clarity, educational preparation, and scope of work within two healthcare systems. *Clinical Journal of Oncology Nursing, 23*(1), 52-29. doi:10.1188/19.CJON

Centers for Medicare & Medicaid Services. (n.d.). *Medicare.gov: Hospital compare*. Retrieved from:

https://www.medicare.gov/hospitalcompare/compare.html#cmprTab=4&cmprID=490032%2C490059%2C490118&cmprDist=0.5%2C6.5%2C9.0&dist=25&loc=RICHMOND%2C%20VA&lat=37.5407246&lng=-77.4360481

Centers for Medicare and Medicaid Services. (2019). *Outcome measures*. Retrieved from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/OutcomeMeasures

Chillakunnel, S., Rawther, H., Pai, M.S., Fernandes, D. J., Mathew, S., Binu, V. S….Nayak, B. S. (2017). A randomized controlled trial to evaluate the impact of a nurse navigator programme on outcomes of people with breast cancer: Study protocol. *Journal of Advanced Nursing, 73*(4), 977-988. https://onlinelibrary.wiley.com/journal/13652648

Dajczman, E., Robitaille, C., Ernst, P., Hirsch, A. M., Wolkove, N., Small, D….Palayew, M. (2013). Integrated interdisciplinary care for patients with chronic obstructive

pulmonary disease reduces emergency department visits and readmissions: A

quality assurance study. *Canadian Respiratory Journal, 20*(5), 351-356.

https://www.hindawi.com/journals/crj/

DeGrace, L. (2018). The role of the surgical nurse navigator: A case scenario. *Canadian*

Oncology Nursing Journal, 28(4), 322-325. https://www.cano-acio.ca/page/conj

Dewitt, K., Coto, J. A., Carr, L., Ondrey, M., & Petkunas, H. (2019). Ambulation

programs: Decreasing length of stay and improving outcomes. *MedSurg Nursing,*

28(5), 293-295, 302. http://www.medsurgnursing.net/cgi-

bin/WebObjects/MSNJournal.woa/wa/viewSection?s_id=1073744514

Di Palo, K. E., Patel, K., Assafin, M., & Piña, I. L. (2017). Implementation of a patient

navigator program to reduce 30-day heart failure readmission rate. *Progress in*

Cardiovascular Diseases, 2017, 259-266. doi:10.1016/j.pcad.2017.07.004

Dima, G., & Skehill, C. (2011). Making sense of leaving care: The contribution of

Bridges' model of transition to understanding the psycho-social process. *Children*

and Youth Services Review, 33(2011), 2532-2539.

doi:10.1016/j.childyouth.2011.08.016

Fulbrook, P., Jessup, M., & Kinnear, F. (2017). Implementation and evaluation of a

"Navigator' role to improve emergency department throughput. *Australasian*

Emergency Nursing Journal, 20(2017), 114-121. doi:10.1016/j.aenj.2017.05.004

Gordon, L. G., Spooner, A. J., Booth, N., Downer, T. R. Hudson, A., Yates, P…. Chan,

R. (2018). Do nurse navigators bring about fewer patient hospitalisations? *Journal*

of Health Organizations and Management, 33(1), 51-62.

www.emeraldinsight.com/1477-7266.htm

Gunadi, S., Upfield, S., Pham, N. D., Yea, J., Schmiedeberg, M. B., & Stahmer, G. D. (2015). Development of a collaborative transitions-of-care program for heart failure patients. *American Journal of Health-System Pharmacy, 72,* 1147-1152. doi:10.2146/ajhp140563

Häggstrom, M., Asplund, K., & Kristiansen, L. (2012). How can nurses facilitate patient's transitions from intensive care? A grounded theory of nursing. *Intensive and Critical Care Nursing, 28,* 224-233. doi:10.1016/j.iccn.2012.01.002

Hannan, E. L., Zhong, Y., Lahey, S. J., Culliford, A. T., Gold, J. P., Smith, C. R….Wechsler, A. (2011). 30-day readmissions after coronary artery bypass graft surgery in New York State. *JACC: Cardiovascular Interventions, 4*(5), 569-576. doi:10.1016/j.jcin.2011.01.010

Hannan-Jones, C., Young, C., Mitchell, G., & Mutch, A. (2019). Exploring nurse navigators' contribution to integrated care: A qualitative study. *Australian Journal of Primary Health, 25,* 339-345. doi:10.1071/PY19042

Heritage, B., Harvey, C., Brown, J., Hegney, D., Willis, E., Baldwin, A…. Curnow, V. (2020). The use of telephone communication between nurse navigators and their patients. *PLoS ONE, 15*(1), 1-13. doi:10.1371/journal.pone.0227925

Heslop, L., Cranwell, K., & Burton, T. (2019). Care coordination for chronic and complex health conditions: An experience based co-design study engaging consumer and clinician groups for service improvement. *PLoS ONE, 14*(10), 1-11. doi:/10.1371/journal.pone.0224380

Heys, M., Rajan, M., & Blair, M. (2017). Length of paediatric inpatient stay, socioeconomic status and hospital configuration: A retrospective cohort study. *BMC Health Services Research, 17*(274), 1-12. doi:10.1186/s12913-017-2171-x

Hudson, A. P. Spooner, A. J., Booth, N., Penny, R. A., Gordon, L. G., Downer, T. R….Geary, A., (2019). Qualitative insights of patients and carers under the care of nurse navigators. *Collegian, 26,* 110-117. doi:10.1016/j.colegn.2018.05.002

Im, E.O. (2011). Transitions theory: A trajectory of theoretical development in nursing. *Nursing Outlook, 59*(2011), 278-285. doi:10.1016/j.outlook.2011.03.008

Jeyathevan, G., Lemonde, M., & Brathwaite, A. C. (2017). The role of oncology nurse navigators in facilitating continuity of care within the diagnostic phase for adult patients with lung cancer. *Canadian Oncology Nursing Journal, 27*(1), 75-80. doi: 10.5737/236880762717480

Kowalkowski, M., Chou, S. H., McWilliams, A., Lashley, C., Murphy, S., Rossman, W….Taylor, S. P. (2019). Structured, proactive care coordination versus usual care for Improving Morbidity during Post-Acute Care Transitions for Sepsis (IMPACTS): A pragmatic, randomized controlled trial. *BioMed Central, 20*(660), 1-13. doi:10.1186/s13063-019-3792-7

Kralik, D., Visentin, K., & Van Loon, A. (2006). Transition: A literature review. *Journal of Advanced Nursing, 55*(3), 320-329. doi: 10.1111/j.1365-2648.2006.03899.x

Kripalani, S., Chen, G., Ciampa, P., Theobald, C., Cao, A., McBride, M….Speroff, T. (2019). A transition care coordinator model reduces hospital readmissions and costs. *Contemporary Clinical Trials, 81*, 55-61. doi:10.1016/j.cct.2019.04.014

Lee, T., Ko, I., Lee, I., Kim, E., Shin, M., Roh, S.…Chang, H. (2011). Effects of nurse navigators on health outcomes of cancer patients. *Cancer Nursing, 34*(5), 376-384. doi: 10.1097/NCC.0b013e3182025007

Li, Z., Armstrong, E. J., Parker, J. P., Danielsen, B., & Romano, P. S. (2012). Hospital variation in readmission after coronary artery bypass surgery in California. *Circulation: Cardiovascular Quality and Outcomes, 5*, 729-737. doi: 10.1161/CIRCOUTCOMES.112.966945

Litwinowicz, R., Bartus, K., Drwila, R., Kapelak, B., Konstanty-Kalandik, J., Sobczynski, R…Sadowski, J. (2015). In-hospital mortality in cardiac surgery patients after readmission to the intensive care unit: A single-center experience with 10,992 patients. *Journal of Cardiothoracic and Vascular Anesthesia, 29*(3), 570-575. doi:10.1053/j.jvca.2015.01.029

Loiselle, C. G., Attieh, S., Cook, E., Tardif, L., Allard, M., Rousseau, C.…Talbot, D. (2020). The nurse pivot-navigator associated with more positive cancer care experiences and higher patient satisfaction. *Canadian Oncology Nursing Journal, 30*(1), 48-60. doi:10.5737/236880763014853

McEvoy, L., Kennedy, J., & Davis, M. E. (2007). Optimizing combined modality patient outcomes through intense nursing care coordination and management. *Oncology Nursing Forum, 34*(2), 541. https://onf.ons.org/

McEwen, M., & Wills, E. M. (2019). Theoretical basis for nursing (5th ed.) Philadelphia, PA: Wolters Kluwer Health.

McMurray, A., Ward, L., Johnston, K., Yang, L., & Connor, M. (2018). The primary

health care nurse of the future: Preliminary evaluation of the nurse navigator role in integrated care. *Collegian, 25*(2018), 517-524. doi:10.1016/j.colegn.2017.12.003

Meleis, A. I. (2010). Transitions Theory: Middle Range and Situation Specific Theories in Research and Practice. New York, NY: Springer Publishing Company.

Miller, L. B., Sjoberg, H., Mayberry, A., McCreight, M. S., Ayele, R. A., & Battaglia, C. (2019). The advanced care coordination program: a protocol for improving transitions of care for dual-use veterans from community emergency departments back to the Veterans Health Administration (VA) primary care. *BMC Health Services Research, 19*, 1-10. doi:10.1186/s12913-019-4582-3

Nembhard, I. M., Buta, E., Lee, Y. S. H., Anderson, D., Zlateva, I., & Cleary, P.D. (2020). A quasi-experiment assessing the six-month effects of a nurse care coordination program on patient care experiences and clinician teamwork in community health centers. *BMC Health Services Research, 20,*1-14. doi:10.1186/s12913-020-4986-0

Pan, J. (2017). Messy but fair: The ACA's hospital value-based purchasing program and the notice-and-comment process. *Journal of Legal Medicine, 37*, 325-369. doi: 10.1080/01947648.2017.1385038

Passwater, C., & Itano, J. (2018). Care coordination: Overcoming barriers to improve outcomes for patients with hematologic malignancies in rural settings. *Clinical Journal of Oncology Nursing, 22*(5), 549-554. doi: 10.1188/18.CJON.549-554

Phillips, J. L. H., Rondon, A. J., Vannello, C., Fillingham, Y. A., Austin, M.

S….Courtney, P. M. (2019). A nurse navigator program is effective in reducing

episode-of-care costs following primary hip and knee arthroplasty. *The Journal of*

Arthroplasty, 34(2019), 1557-1562. doi:10.1016/j.arth.2019.04.062

QuickFacts, Richmond city, Virginia. (2018). United States Census Bureau. Retrieved

from

https://www.census.gov/quickfacts/fact/table/richmondcityvirginiacounty/PST120

218

Rancour, P. (2008). Using archetypes and transitions theory to help patients move from

active treatment to survivorship. *Clinical Journal of Oncology Nursing, 12*(6),

935-940. doi: 10.1188/08.CJON.935-940.

Redžek, A., Mironicki, M., Gvozdenović, A., Petrović, M., Čemerlić-Ađić, N., Ilić,

A….Velicki, L. (2015). Predictors for hospital readmission after cardiac surgery.

Journal of Cardiac Surgery, 30, 1-6. doi: 10.1111/jocs.12441

Saltzberg, M., Conti, M., Scott, M., Wieloch, L., Mortensen, N., & Mohammed, A.

(2018). "A sure thing" – Connecting heart failure patients through the inpatient

heart failure navigator to the outpatient care coordination team: A highly

successful strategy to reduce readmissions. *Journal of Cardiac Failure, 24*(8S),

S98. https://www.onlinejcf.com/

Schell, W. (2014). A review: Discharge navigation and its effect on heart failure

readmissions. *Professional Case Management, 19*(5), 224-234. doi:

10.1097/NCM.0000000000000040

Seldon, L. E., McDonough, K., Turner, B., & Simmons, L. A. (2016). Evaluation of a

    hospital-based pneumonia nurse navigator program. *The Journal of Nursing*

    Administration, 46(12), 654-661. doi: 10.1097/NNA.0000000000000422

Shadvar, K., Mahmoodpour, A., Soleimanpour, H., Bilejani, E., Naghipour, B.,

    Sheikhzadeh, D…. Shadbakhsh, R. (2015). Assessment of patient and relatives

    satisfaction in a cardiac surgery ICU model. *Advances in Bioscience & Clinical*

    Medicine, 3(4), 17-22. doi: 10.7575/aiac.abcmed.15.03.04.05

Shin, J., Shin, D. W., Lee, J., Hwang, J. H., Yoo, J. E., Ko, H….Song, Y. M. (2020).

    Association between perception of care coordination and health outcomes in

    Korean cancer survivors. *Health and Quality of Life Outcomes, 18*(21), 1-10.

    doi:10.1186/s12955-020-1279-6

Singh-Carlson, S., Wong, F., Trevillion, K., & Reynolds, G. (2018). Impact of a breast

    cancer care RN – coordinator program on patients' distress level. *Canadian*

    Oncology Nursing Journal, 28(4), 250-261. doi:10.5737/23688076284250255

Strano, A., Briggs, A., Powell, N., Brockman, J., Taylor, J., Butler, A….Ward – Smith, P.

    (2019). Home healthcare visits following hospital discharge: Does the timing of

    visits affect 30-day hospital readmission rates for heart failure patients? *Home*

    Healthcare Now, 37(3), 152-157.

    https://journals.lww.com/homehealthcarenurseonline/pages/default.aspx

Stumm, J., Thierbach, C., Peter, L., Schnitzer, S., Dini, L., Heintze, C….Döpfmer, S.

    (2019). Coordination of care for multimorbid patients from the perspective of

    general practitioners – a qualitative study. *BMC Family Practice, 20,*1-11.

    doi:10.1186/s12875-019-1048-y

Swan, B. A., Conway-Phillips, R., Haas, S., & De La Pena, L. (2019). Optimizing strategies for care coordination and transition management: Recommendations for nursing education. *Nursing Economics, 37*(2), 77-85. https://www.ajj.com/clients/associations/jannetti-publications-inc-jpi/nursing-economic

Toivo, T., Airaksinen, M., Dimitrow, M., Savela, E., Pelkonen, K., Kiuru, V….Puustinen, J. (2019). Enhanced coordination of care to reduce medication risks in older home care clients in primary care: A randomized controlled trial. *BMC Geriatrics, 19,*1-13. doi:10.1186/s12877-019-1353-2

Villanueva, C., Talwar, A., Doyle, M. (2018). Improving informed consent in cardiac surgery by enhancing preoperative education. *Patient Education and Counseling, 101,* 2047-2053. doi:10.1016/j.pec.2018.06.008

Vohra, H. A., Goldsmith, I. R. A., Rosin, M. D., Briffa, N. P., & Patel, R. L. (2005). The predictors and outcome of recidivism in cardiac ICUs. *European Journal of Cardio-thoracic Surgery, 27*, 508-511. doi:10.1016/j.ejcts.2004.11.016

Yatim, F., Cristofalo, P., Ferrua, M., Girault, A., Lacaze, M., Di Plama, M….Minvielle, E. (2017). Analysis of nurse navigators' activities for hospital discharge coordination: A mixed method study for the case of cancer patients. *Support Care Cancer, 25,*863-868. doi:10.1007/s00520-016-3474-x

Ziaeian, B., & Fonarow, G. C. (2016). The prevention of hospital readmissions in heart failure. *Progress in Cardiovascular Diseases, 58*, 379-385. doi:10.1016/j.pcad.2015.09.004