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An Integrated Care Transitions Program and 30-day Readmission Rates for Heart Failure and Chronic Obstructive Pulmonary Disease

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This is to certify that the doctoral study by

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Abstract

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Kathryn Martinez

MSN, Walden University, 2014

BSN, Rush University College of Nursing, 1988

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Healthcare Administration

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Abstract

The impact of hospital readmissions on an organization includes reimbursement penalties, elevated mortality and morbidity rates, increased health care expenditures, and poor quality of life for the community's residents. This study examined the impact of an integrated care transitions program on the 30-day readmission rates for heart failure and chronic obstructive pulmonary disease (COPD) within an independent rural community health care organization in Middle America. The two research questions pertained to the relationships pre-and post-implementation of this program to the 30-day readmission rates for these two disease processes. The Donabedian model examined the structure and function of an integrated care transitions program and 30-day readmission outcomes. Data from the Vizient Clinical Data Base were analyzed to determine the association between the variables using the Mann-Whitney U and Bayesian Regression test, including one-way ANOVA. The rate of 30-day readmission for both heart failure and COPD patients was reduced after the implementation of the integrated care transitions program and therefore the null hypotheses were rejected. Research recommendations include exploring the readmission patterns for other diseases and within different health care settings. This study may guide health care administrators in understanding the impact of an integrated care transitions program on 30-day readmission rates. This understanding may also highlight health care disparities and challenges of providing health care within rural health care settings leading to positive social change through the development of programs focused on care transitions and the delivery of patient-centered care resulting in the reduction of cost for patients and health care organizations.

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Dedication

This study is dedicated to my mother, Evarista Wheeler, who meant the world to me. Unfortunately, my mom died in 2020 from ovarian cancer before she could see me obtain my DHA degree. She would be smiling ear to ear knowing my capstone was completed, as she was one of my biggest cheerleaders and always told me to never give up. She shared her faith with me, and over the last few years, I have leaned on that faith more than ever. My mom always believed in me and inspired me to be the person I am today.

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Section 1: Foundation of the Study and Literature Review

Introduction

The prevention of patient readmissions continues to challenge health care organizations as the population ages; more patients are diagnosed with multiple chronic conditions, the social determinants of health increase, and each patient encounters numerous transitions of care across the continuum. Up to 20% of Medicare beneficiaries are readmitted within 30 days of initial admission, which results in socioeconomic burden, decreased quality of life due to frequent hospitalization, loss of productivity, and poor patient outcomes (Arora et al., 2017). The lack of communication and multi-faceted care coordination contributes to increased readmission rates (Herzig et al., 2016). Three areas of focus that need to be developed to prevent readmission include enhanced self-management care plans, engagement of family and community support, and linkage to material and human resources throughout the transitions of care (Herzig et al., 2016).

The Hospital Readmissions Reduction Program (HRRP) is a value-based program for Medicare patients which results in financial gain or payment reduction for health care organizations (Centers for Medicare and Medicaid Services [CMS], 2021). Heart failure and chronic obstructive pulmonary disease (COPD) are two of the six disease processes or procedure-specific measures within the HRRP program. The national prevalence of COPD is 11.47%, and heart failure is 13.95%, while the State of Illinois' prevalence is 11.83% and 15.35%, respectively (CMS, 2021). The population for my study included five rural counties in Illinois with a COPD prevalence ranging from 7.6-12.06% and a heart failure prevalence ranging from 10.71 -15.46% (CMS, 2021). Within the five

counties of this study, the prevalence of two to three chronic conditions is 30.47%, resulting in $5,642 per capita Medicare spending and an average of 424 emergency room visits per 1,000 (CMS, 2021).

Rural community hospitals face limited material and human resources and experience financial strain while caring for older and sicker patient populations, including a higher rate of marginalized and at-risk community members (Joseph, 2021). Clinical outcomes may suffer at rural health care organizations because of challenges in care coordination which impacts the health of the population (Joseph, 2021). Within the five counties of this study, there is a lack of transportation and a significant geographical distance from one care setting to another. Other compounding factors within this geographical study area include an aging population, economic challenges, and workforce shortages.

This study addressed the readmission rates for patients with heart failure and COPD before implementing an integrated care transitions program (pre-program) and after the implementation of an integrated care transitions program (post-program). The current payor mix for this health care system, located in the Middle America, is 80% Medicare and Medicaid, 14% private insurance, and 6% self-pay. The information from this study may help other rural health care organizations develop an integrated care transitions program to reduce readmissions for heart failure and COPD patients.

A patient's transition from one care setting to another is often complex and therefore requires coordination and communication between the patient, care team, social workers, and community agencies to prevent readmission (Oikonomou et al., 2019). The

challenges facing this rural health care organization require a new approach to delivering care, which required an evaluation and assessment of new care delivery models.

Problem

The decentralized and fragmented health care delivery system has been credited for unsafe patient care and dismal outcomes (Institute of Medicine [IOM], 2001). To be patient-centric, efficient, equitable, and deliver timely patient care, the health care organization must redesign the delivery of care to include evidence-based practice, patient-centeredness, and a systems-minded approach (IOM, 2003). Health care organizations must take calculated risks with innovation, individualize disease-specific patient care plans, and redesign the system approach to impact the progression of chronic disease (IOM, 2003).

Within the rural communities in the United States, the age-adjusted death rate for the five leading causes of death and the rate of potentially excess deaths secondary to a lack of public health programs and access to services is higher than in urban areas (Ziller & Coburn, 2018). Over 60% of rural communities are designated as mental health provider shortage areas, and rural communities have nine times less per capita the number of specialists found in urban communities (Ziller & Coburn, 2018). The following conditions contribute to poor health outcomes within rural communities: economic trends, provider shortages, limited participation in the Affordable Care Act, and the loss of specialty services (Ziller & Coburn, 2018). The health care organization must be innovative and create new delivery of care systems to ensure safe, quality care close to home within rural settings (Ziller & Coburn, 2018).

Up to 79% of hospital readmissions are preventable when the discharge plan is unique to the patient and includes the patient attending a follow-up appointment within 30 days with his or her primary care provider (Hardman & Newcomb, 2016). The cost burden associated with heart failure readmissions may negatively impact a rural community hospital, forcing closure and placing the community at risk (Vesterlund et al., 2015). According to Hardman and Newcomb (2016), the lack of resources within rural communities often results in ineffective transitions of care. Increased readmission rates are often associated with poor patient self-management of their disease compounded with a lack of coordinated care transitions leading to adverse quality outcomes (Vesterlund et al., 2018). There is a lack of evidence of rural community hospitals demonstrating improved readmission rates for heart failure and COPD through the development and implementation of an integrated care transitions program.

The specific research problem addressed through this study is the impact of a rural community hospital's incorporation of initiatives through an integrated care transitions program and the correlation to patient outcomes specific to 30-day readmission rates for heart failure and COPD. Although researchers have studied and investigated how to reduce or prevent readmissions, there is minimal or no literature on developing and implementing strategies of an integrated care transitions program in a rural community hospital to determine if there are improvements in patient outcomes specific to heart failure and COPD readmissions. A gap in the literature exists specific to the effects of program implementation in rural health care organizations versus quality improvement programs and efforts specific to the financial impacts of the HRRP (Lu et

al., 2016). Despite the negative variances in health outcomes in rural areas, a gap in research exists regarding the types and configurations of clinical models and the community approach needed to address the complex issues facing rural America, resulting in differences in higher readmission rates and mortality than urban areas (Harrington et al., 2020).

Purpose of the Study

The purpose of this quantitative study was to examine the relationship between the independent variable of an integrated care transitions program and the dependent variables of 30-day readmission rates for heart failure and chronic obstructive pulmonary disorder, pre-and post-implementation of the integrated care transitions program, between the years of 2015 and 2021. Hospital administrators must be cognizant of readmission rates and the contributing factors to readmissions within their patient base. The HRRP, in addition to the Hospital Value-Based Purchasing Program and the Hospital-Acquired Conditions Reduction Program, are programs designed by the Centers for Medicare and Medicaid (CMS) to improve the quality of care, reduce the cost of care, and improve the health of the population while enhancing transparency (CMS, 2021). For this study, a readmission occurs within 30 days of the initial hospital stay, may or may not be related to the first diagnosis, and may occur at the same or a different hospital (CMS, 2021).

The independent variables included pre-and post-implementation of an integrated care transitions program at an independent rural community hospital located in Middle America. The dependent variables included the 30-day readmission rates for heart failure and COPD during the specified time frame. The study addressed the dependent variables

of 30-day readmission rates for heart failure and COPD Medicare patients prior to establishing an integrated care transitions program (pre-enrollment) and after establishing an integrated care transitions program (post-enrollment) to determine whether there was a statistical difference in the readmission rates. The results of this study will provide insight regarding the benefits of an integrated care transition program on readmission rates, the quality of life, and the cost of care. The study may help health care administrators determine the benefits and usefulness of investing in an integrated care transitions program.

Readmissions associated with COPD occur more frequently if the patient is discharged without adequate support mechanisms, participates in both Medicare and Medicaid, and has chronic comorbidities (Robbins & Wesselius, 2015). There is little evidence regarding the risk factors for COPD readmissions, the reasons and contributing factors to COPD readmission, and interventional measures to prevent readmission secondary to COPD (Robbins & Wesselius, 2015). For Medicare patients, in 2018, COPD was among the five top diagnoses for readmission (Agency for Healthcare Research and Quality [AHRQ], 2021).

According to the CMS, the HRRP incentives and penalties are designed to encourage the development and implementation of programs that enhance communication which engages the patient and caregivers leading to improved outcomes, including reduced readmissions as patients transition to outpatient or post-discharge care (CMS, 2021). The findings from this research study may contribute to positive social change by providing a framework during care transitions that reduces 30-day readmission

rates of heart failure and COPD patients, which decreases the cost of care, improves patient outcomes, and delivers patient-centric care for patients in rural community settings. This study may also encourage funding for integrated care transitions programs focused on the entire continuum of care in other rural areas.

Research Questions and Hypotheses

RQ1: What is the relationship pre- and post-implementation of an integrated care transitions program on the heart failure 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America?

$H_0$1: There is no correlation pre- and post-implementation of an integrated care transitions program on the heart failure 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America.

$H_1$1: There is a correlation pre- and post- implementation of an integrated care transitions program on the heart failure 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America.

RQ2: What is the relationship pre- and post- implementation of an integrated care transitions program on the COPD 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America?

$H_0$2: There is no correlation pre- and post- implementation of an integrated care transitions program on the COPD 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America.

$H_1$2: There is a correlation pre- and post- implementation of an integrated care transitions program on the COPD 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America.

Theoretical Foundation

The theories and concepts that grounded this study include the Donabedian model composed of three components: input or structure, processes, and outcome, all of which are interdependent to produce quality outcomes. The logical connections between the framework presented and the nature of this study include the structure which creates or constrains the delivery of care, the process of delivering care to patients, which creates outcomes, and the structure which creates processes that directly contribute to the outcomes. According to Cullen et al. (2018), the Donabedian model identifies outcomes as the results of the care provided, the process of care delivery, and the structure as the setting for the delivery of care. The integrated care transitions team structure identifies and implements processes across the care continuum to produce outcomes at this rural community health care organization.

Figure 1

Donabedian Framework (Structure, Process, Outcomes)

Structure	Process	Outcomes
Integrated Care Transitions Program	Evidence-Based Care Development of new roles Community partner program	Heart failure readmission rates COPD readmission rates
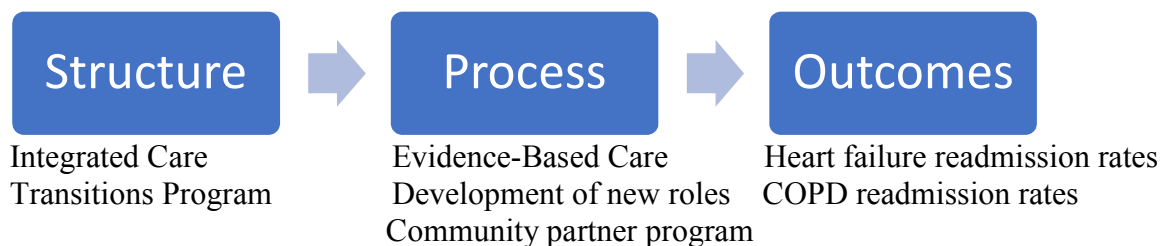
Nature of the Study

The specific research design in this quantitative study included using a multivariate multiple regression with Pearson's multiple correlation coefficient for RQ1 and RQ2 to understand the correlation between the independent and the combined effect of the dependent variable (Frankfort-Nachmias et al., 2020). The independent variables are pre-and post-implementation of an integrated care transitions program, and the dependent variables are the 30-day readmission rates for Medicare heart failure and COPD patients at this rural community hospital located in Middle America.

For this study, I used a secondary data set from Vizient, Inc., a health care analytics platform for quality improvement, specific to this rural community health care organization from 2015 through 2021. The database met the data reporting requirements for the CMS and allowed me to benchmark the data from the study's organization against similar health care organizations specific to readmissions. I requested permission to access the data specific to this organization from Vizient, and a request to the study's organization's institutional review board (IRB) committee was submitted.

Literature Review Search Strategy

The literature review consisted of the following resources: ProQuest Central, CINAHL Plus, Medline, Thoreau-Walden university Library, Sage Journals, Public Administration Abstracts, and PubMed. The following keywords were searched: *care transitions model, readmission rates within 30 days, readmission rates for COPD and heart failure, health care settings, challenges to disease management in the rural setting, mortality rates, rural health outcomes, Donabedian Model,* and *social determinants of*

health. The literature review was limited to current peer-reviewed articles unless the relevant source was greater than 7 years. The relevant articles were selected based on the study and the identified variables.

<div align="center">**Literature Review Related to Key Variables**</div>

The purpose of this literature review was to provide an exhaustive review of recent literature specific to the dependent and independent variables of this study and the methodology of the study while justifying the study's relevance to the existing knowledge of readmission reduction and prevention. For the review, the literature was synthesized specifically to 30-day readmission rates for heart failure and COPD (dependent variables) and the independent variable of an integrated care transitions team within a rural health care organization. Below, I have outlined what is currently available in the literature regarding readmission rates, prevention strategies, rural health care delivery, care transition programs, and their relevance to this study.

30-day Readmission Overview

The Centers for Medicare and Medicaid Services impose financial penalties on health care organizations for readmissions within 30 days of primary hospitalization for specific disease processes. Financial penalties are imposed despite the reason for readmission, even unrelated, such as readmission due to a fractured wrist after primary admission for pneumonia. According to the Agency for Healthcare Research and Quality, in 2018, over 3.8 million readmissions incurred an average cost of $15,200 (AHRQ, 2021). In 2018, twenty percent of the total readmissions were attributed to septicemia, heart failure, diabetes, and COPD (AHRQ, 2021).

The study by Walji et al. (2021) revealed that patients with more than one emergency room visit in the past six months had a readmission rate of 18.6%, while patients without a previous emergency room visit had a 9.1% readmission rate (P=0.05). The authors of this study utilized multiple logistic regression models. The study classified patients into a low, medium, or high risk for readmission correlating to a less than 10% chance to greater than 20% risk based on the LACE readmission risk assessment tool. The criteria for the tool include the length of stay, acuity of illness, presence of comorbidities, and utilization of the emergency room within the previous six months prior to admission (Walji et al., 2021). The 217 participants were three times more likely to be readmitted if they did not attend a primary care appointment within 30 days of discharge. Within this study, the readmission rate for heart failure patients was increased 19% and by 15% for post-surgical patients who did not attend a follow-up appointment. This study demonstrated a 14.7% readmission rate for the 217 participants, with no difference in rates based on age or sex, 9% for the low-risk group, 15% for the medium, and 25% for the high risk (p=0.009). The study demonstrated the importance of follow-up within 30 days to prevent readmissions.

According to Yu and Rouse (2017), factors impacting readmission rates include patient demographics, behavioral, socioeconomic, and clinical factors, hospital finances, and the effectiveness of care. In the regression study of 1,518 hospitals by Yu and Rouse, lower readmission rates were associated with hospitals that demonstrated higher patient satisfaction scores, a high case mix, and served a less poor population than their counterparts. This study included data from the Hospital Cost Report, the HRRP

(Hospital Readmission Reduction Program), the United States census, CMS (Centers for Medicaid and Medicare Services) Impact File, Hospital Compare data, and the Medicare Inpatient Provider Utilization and Payment data (Yu & Rouse, 2017). The study demonstrated that hospitals with low readmission rates had more monetary funds to allocate to care transitions and delivered effective care as measured by pre-defined quality metrics. Hospitals with higher readmission rates serve lower-income patients, encounter a lower bed utilization, and score lower on the effectiveness of care measures. This study mentions that it is critical for health care decision policymakers to acknowledge the impact of financial penalties on health care organizations serving low-income patients and experiencing financial hardships due to reimbursement in an effort for those organizations to remain viable.

In a study by Wan et al. (2017), the factors associated with readmissions in eight southeastern states included demographic attributes, diagnostic condition, discharge status, factors of the health care system, and geographical distance to the hospital. Previous empirical studies have concentrated on demographic challenges, diagnosis, discharge status, and geographic location of the health care organization. Within this study, three prominent factors, lack of a care transitions program, poor access to health care, and a lack of quality outcomes, impacted an organization's readmission rate. In this multivariate analysis, rural health care organizations experienced higher readmission rates than urban organizations despite system-based efforts at readmission prevention. This study suggests that health care organizations should evaluate the need for community-based care modalities to address the risk factors associated with readmission

rates. The striking health disparities encountered within the rural areas contribute to the $17.4 billion costs associated with avoidable readmissions (Wan et al., 2017).

Readmissions Specific to Heart Failure

By the year 2030, more than eight million individuals will be diagnosed with heart failure resulting in a total cost of $69.7 billion in the United States (Miller, 2017). In the article by Miller, the cost of caring for a patient with heart failure totals $109,541, with the majority of costs (>$83,000) incurred during hospitalization. The most common medical conditions associated with heart failure readmissions include cardiac (heart failure, coronary artery disease, arrhythmia), pulmonary disease, and renal disease (Arora et al., 2017). Factors listed within this article associated with heart failure readmission include comorbidities (specifically chronic pulmonary disease, renal disease, and diabetes), discharge to a long-term care facility, polypharmacy, deconditioning, nutritional deficits, and a longer length of stay than predicted (Arora et al., 2017).

Heart failure Medicare patients who are hospitalized experience a 67.4% readmission rate and a 35.8% risk of mortality within one year of hospitalization (Macchio et al., 2020). Within three days of discharge, heart failure patients are at the highest risk for readmission. A single-pronged approach to preventing heart failure readmissions has not been identified. In a literature review by Macchio et al., 63.1% of heart failure patients were not aware or educated about medication changes at discharge, while focused education to the patient and support system decreased readmissions by 56.2 percent. In the study by Macchio et al. (2020), a three-step interventional program was implemented to decrease heart failure readmissions. In this study, heart failure

readmission rates were decreased from 19.47% in quarter one of 2010 to 14.44% in quarter three of 2013. This tactical approach to preventing readmissions increased the number of patients attending a post-discharge appointment with a cardiologist from 10% in 2010 to 46% in 2014. Heart failure admissions and readmissions will occur despite robust prevention programs due to exacerbating symptoms and disease progression.

The most common social risk factors associated with readmissions include race, ethnicity, socioeconomic status, place of residence, and disability. Despite the prevalence of the risk factors listed above, 67% of hospitals faced readmission penalties because of the HRRP program. In a study by Murray et al. (2021), 4,496,384 heart failure index admissions and 1,080,492 (24%) 30-day readmissions went under review. The study findings include readmission rates for females of 23.7% versus males 24.3% ($p < 0.001$), rural residents 22.9% versus urban residents (24.2%), and an overall increase in readmit rates for those with median household incomes versus those in the high-income quartile ($p<0.001$) (Murray et al., 2021). This study found that Medicare patients with an income of $\leq$ \$37,999 were more likely to be readmitted than other study participants.

As health care organizations develop strategies to prevent readmissions, the tactics must address social and economic disparities. The social determinants of health account for 80% of health outcomes, while the medical care and interventions provided to patients contribute to 20% of the outcomes (Murray et al., 2021). The social and health inequities experienced by patients may result in poor health literacy, inability to afford prescriptions, a lack of transportation to medical visits, and little to no social support, impacting health behaviors and ultimately impacting readmission rates. The health

inequities within the communities require health care organizations to develop new care delivery models and advocate for health care policy changes.

Readmissions Specific to Chronic Obstructive Pulmonary Disease

COPD was the third leading cause of death for those >60 years old in 2016 globally and the fourth leading cause of disability in this same age group (Levin et al., 2020). Patients with COPD who experience a lower socioeconomic status have twice the poor outcomes than comparison groups secondary to smoking status, poor nutritional status, and exposure to pollutants.

In a prospective cohort study of 82 COPD patients by Alqahtani et al. (2021), 38% were readmitted within 30 days with the following contributing factors: previous exacerbations of COPD, decreased peak inspiratory flow rate, a longer length of stay, and elevated at-risk for readmission scores (CI 0.78-0.95, p<0.001). At 90 days, this same patient population experienced a 56% readmission rate with the following contributing components: frailty, previous exacerbations, and hospitalizations for COPD, depression, decreased peak inspiratory flow rate, and high risk for readmission scoring (Alqahtani et al., 2021). This study revealed that 51% of the readmissions were female, had a mean age of 71, the average time to readmission was 11 days, and the participants had a smoking history of 29-56 pack years. This logistical regression analysis promotes interventions to identify at-risk readmissions patients and timely treatment to prevent or reduce the clinical and economic burdens experienced by COPD patients.

Raju et al. (2019) studied the prevalence of COPD in the United States, revealing a prevalence of COPD in poor, rural areas (15.4%) twice as much as urban locations

(8.4%). Within the study, rural residence (p<0.001) and census-level poverty (p=0.012) contributed to the prevalence of COPD. Community poverty was associated with COPD prevalence (p=0.012), while homeownership and a college education decreased COPD prevalence. The urban-rural disparity exists and places those in rural areas at a greater risk of developing COPD despite their smoking status. The identified contributing factors to COPD prevalence in rural communities in this study include lack of or poor access to health care, exposure to air pollution, low birth weights, nutritional status, poor health literacy, and barriers within insurance coverage.

The study by Murray et al. (2021) of 4.198.163 index admissions and 893,376 (21.3%) readmissions for COPD revealed readmission rates of 20.6% for females versus 22.2% males (p<0.001), urban 21.7% versus rural 19.5% (p<0.001), and a median income of ≤ $37,999 contributing to increased readmissions for COPD. This study identifies a potential contributing factor to the increased readmission rate for urban areas as the acute condition of the patients and transfers in from rural and community settings. The study reveals all three factors: economic, behavioral, and social contributions to readmission rates for COPD patients.

Care Transitions Across the Continuum

Within the health care setting, care transitions occur as the patient traverses across the care continuum in various settings, such as hospital, home, ambulatory office practice setting, and skilled nursing facilities. The patient requires coordination of care, interventions, and a wide range of services to prevent complications and negative outcomes throughout the transitions of care. In a study by Ahsberg (2019), sample size

of 1,121,823 discharged patients, 30% required outpatient services (n=334,142), 5%

medical/social services (n=53,763), 20% social services (n=221,221), and 2% were

readmitted (n=25,760) within 30 days post-discharge. The results of this study mirror

similar challenges across other health care organizations: aging patient population,

shortage of beds both in the acute and long-term facilities, lack of or inaccurate transfer

of information at each transition, lack of a formal care transitions program, and staffing

challenges across the continuum.

When there is a lack of adequate care coordination or care transitions, the patient

is at risk for readmission within 30 days, may experience adverse health outcomes, and

may experience a delay in recovery after hospitalization. The mixed-methods study by

Hardman and Newcomb (2016) identified the following social/health care contributors to

ineffective care transitions: cost and insurance (77%), transportation (60%), and

convenience of primary care providers (73%). This same study identified personal

attributes that resulted in challenges to care transitions: relationship with a primary care

provider, patient self-perception of health, and family or cultural values. The study

utilized Azjen's theory of planned behavior to identify the driving forces behind the

influential factors related to patient behavior and care transitions. When addressing the

multiple transitions of care across the continuum, the organization must address internal

and external barriers.

While care transitions occur at various types of health care organizations, the

challenges specific to rural sites are unique. Ineffective care transitions specific to rural

communities include primary care provider instability and accessibility in the community

(11% of physicians work in rural locations), lack of transportation, geographical distance, insurance coverage, and lack of home visits (Hardman & Newcomb, 2016). Within the study by Hardman and Newcomb (2016), 47% of the participants recently lost their primary care provider. The lack of rural health care providers adds additional pressures to health care organizations regarding physician recruitment, alternative care models, and inadequate access points. Rural health care organizations serve large catchment areas, often several counties, resulting in a lack of knowledge about available resources and services. Patients in rural communities experience challenges in discharge planning, including the ability to obtain durable medical equipment and a lack of understanding of insurance benefits. The lack of transportation within rural areas impacts the patient's access to food, community services, and follow-up appointments. Additional challenges to health care services within the rural setting include economic challenges, cultural and social differences, health-seeking behaviors, poor availability of broadband internet services, lack of recognition by legislators regarding health care barriers, and physical isolation due to distance (Douthit et al., 2015).

Components of a Care Transitions Program

A readmission negatively impacts the patient and family, and the health care system. In a study by Weeks et al. (2017), transitional care reduces hospital readmission rate at 30 days with a 95% confidence interval ($p<0.01$), 90 days ($p<0.04$), and 180 days ($p<0.01$). An effective care transitions program investment will positively contribute to the average patient length of stay, mortality rate, improved patient experience, and the cost of care delivery (Geiger et al., 2017). This randomized, controlled study of 1,454

patients demonstrated an effective care transition program aimed at decreasing readmissions, will empower the patient, require a commitment by the patient and support system to change health behaviors, include a personalized plan of care, establish goals congruent with the patient's wishes and definition of quality of life, and demonstrate a comprehensive discharge management plan. Effective care transitions programs include effective communication methods, the ability to address medication compliance, reinforcement of education, appointment scheduling, connection to resources, and evaluation of the patient's adherence to healthy behaviors or lifestyle changes.

The 2015 study conducted by the Patient-Centered Outcomes Research Institute, project ACHIEVE (Achieving patient-centered Care and optimized Health In care transitions by Evaluating the Value of Evidence), identified the components of a successful care transitions program which results in positive patient and caregiver outcomes (Naylor et al., 2017). While this study is limited to Medicare beneficiaries, the findings apply to multiple payor populations. This multimethod study includes an abstract review of 303 articles with the following search categories: readmission, rehospitalization, reduced rehospitalizations, care transitions, and readmit. The barriers to effective care transitions resulting in decreased readmissions and mortality include lack of patient and caregiver engagement, lack of or poor communication, poor continuity of care, inadequate discharge preparation, numerous health and social challenges or determinants, limited collaboration amongst disciplines, gaps in service, and complex treatment regimens. Within this study, the eight components to a successful care transitions program were outlined: patient and caregiver engagement, patient and

caregiver well-being, accountability, medication management dependent on the complexity of the regimen, and the continuity of care. Naylor et al. (2017) limited their definition of care transitions to patients experiencing acute illness during the period from the hospital setting to home. The definition utilized in this study included traditional medical care, community services, and non-traditional services provided by the patient's health care team.

The study by Huckfeldt et al. (2019) of 202 high-risk patients aged 75 years and older did not demonstrate a multicomponent care transition intervention program to reduce 7- or 30-day readmissions or return emergency room visits. This interventional program targeted an older population at high-risk for readmission and included elements of previously studied care transition programs. The program's components included advanced care planning, medication education, adherence to medication regime, nutrition, social support, and care needs specific to safety and follow-up. Some barriers to reducing readmissions within this study include a lack of consistent interdisciplinary team participation, a new electronic health record, and uncontrollable variables within the subsequent care transition, such as long-term care facilities. Among the 179 participants in this study, 79% had one post-discharge visit, 22 were readmitted within four weeks, and 55% had four weekly discharge contacts as prescribed within the program. The recommendations from this study include multicomponent interventions with support from the hospital and post-acute care organizational leadership teams. Care transition programs should include evidence-based care pathways, order sets, advanced practice

clinical teams, and a focus on effective handover of the patient from one care setting to another.

Health Care Challenges in Rural America

Despite advances in medicine and technology, disparities specific to health care continue to exist between the residents of rural and urban communities across the United States. According to a study by Dalstrom et al. (2021), members of rural communities in this country demonstrate a higher level of chronic disease, poorer health outcomes, and decreased access to digital health platforms than those in urban areas (Douthit et al., 2015). The United States Department of Health and Human Services identifies a lack of primary care providers, differences in health-seeking behaviors, and varying care delivery models as the contributors to the disproportionate health care within rural communities (Douthit et al., 2015). Barriers to receiving care in rural areas include lack of transportation and increased travel time to services, financial burdens including underinsurance and poverty, lack of confidentiality of clinical information due to local health care providers, and the substitution of emergency room care for routine visits due to convenience and co-pay (Douthit et al., 2015).

In rural communities, as many as 33% of patients fail to follow up with their primary care provider after hospitalization (Hardman & Newcomb, 2016). Many rural residents lack coordinated efforts and care across the continuum. Many insurers and payors are interested in improving the care transitions in rural settings due to financial savings and reimbursement (Hardman & Newcomb, 2016). The obstacles to post-hospitalization primary care visits in the rural setting include fragmentation and lack of

knowledge of resources, geographical distance, lack of home visits, poor insurance coverage, lack of understanding of insurance benefits, and lack of transportation or reliance on someone else to transport the patient to the appointment (Hardman & Newcomb, 2016).

The Center for Disease Control and Prevention has identified a need to improve the public health structure and access to medical services within the rural communities due to disparities in rural-urban life expectancy (Ziller & Coburn, 2017). This rural-urban life expectancy discrepancy is evidenced by a higher rate of mortality in rural areas for heart disease, cancer, lower respiratory disease, and cerebral vascular accident (Ziller & Coburn, 2017). Rural communities have an aging health service infrastructure, economic challenges with downstream sequelae, lack of adequate mental health services, and complicated pathways leading to poor access (Ziller & Coburn, 2017). In addition to some rural health care organizations closing their doors, other rural health care organizations are finding increasing difficulty in providing and sustaining services vital to their community's well-being (Ziller & Coburn, 2017).

Common characteristics found within rural communities include tobacco utilization, obesity, sedentary lifestyle, diabetes, and cardiovascular disease. Rural residents have an increased mortality rate of 0.17 per patient-year versus urban residents at 0.13 with a $p<0.001$; cardiovascular deaths for rural residents 0.07 and urban at 0.05 with a $p<0.006$; and non-cardiovascular deaths rural 0.10 and urban 0.07 with $p<0.001$ (Manemann et al., 2021). Within rural communities, residents are five times more likely to die from heart disease, cancer, accidents, lower respiratory conditions, and cerebral

vascular accidents than their urban counterparts. Manemann et al. found that rural residents with heart failure have a higher risk of mortality yet decreased emergency room visits and hospitalizations. The contributing factors to these outcomes include an older population, transportation challenges, insurance barriers, decreased educational achievements, lack of health care organizations or workers, and financial strain.

Donabedian Theory

The three components of the Donabedian theory include structure, process, and outcomes. The Donabedian theory describes the synergistic relationship between structure, process, and outcome, which directly correlates to quality within the health care setting (Binder et al., 2021). Donabedian's theory applies to this study as the structure pertains to the organization's characteristics, the process is necessary to achieve the desired outcomes, and the outcome is the effect of the work or processes on the patient.

Literature Gap

The literature review demonstrated gaps regarding the prevention of heart failure and COPD readmissions and safe transitions of care in the rural health care setting. There is also a gap in the literature specific to developing partnerships with community agencies to address the lack of community resources available to patients at risk of readmission in the rural health care setting. While many components of a successful care transition program have been addressed in the literature, there is a gap related to an integrated program focused on prevention of disease, management of chronic disease, supportive/palliative care, and hospice within a rural health care setting and the impact of readmissions specific to heart failure and COPD.

The need for further research in rural America has been identified by the American Heart Association (Harrington et al., 2020). According to Harrington et al. (2020), there is a gap in research related to innovative, efficient, scalable, and effective care delivery models in rural communities across the country. After reviewing the literature and identifying areas of further study, this study will focus on assessing the impact of an integrated care transitions program on the 30-day readmission rate for heart failure and COPD patients in a rural health care organization.

Definitions

30-day Readmission rate: This is the rate of readmission to an acute care hospital within 30 days of the index hospitalization (Medicare.gov, n.d.).

Center for Medicare and Medicaid Services: The federal agency responsible for administering the federal Medicare and state Medicaid programs in the United States (CMS, 2021).

Chronic Obstructive Pulmonary Disease: A group of diseases that cause difficulty breathing and airflow blockage (CDC, 2019).

Health inequity: Health inequities are reflected in differences in the length of life, mortality rates, disease and disability, severity of disease, and access to treatment. Individuals are not able to achieve total health potential due to social position or social circumstances (CDC, 2019).

Heart failure: A condition in which the heart cannot pump enough blood flow and oxygen to support the body's needs (CDC, 2019).

Hospital Readmission Reduction Program (HRRP): A Medicare value-based purchasing program focused on enhanced communication and care coordination to improve patient outcomes and reduce unavoidable readmissions (Medicare.gov, n.d.).

Independent health care organization: An organization governed by a local Board of Directors that is not under the management of an extensive health care system (AHRQ, n.d.).

Integrated care transitions program: A program specific to the study's organization that focuses on collaboration between community outreach, a complex care management team, remote patient monitoring, supportive care/ palliative care team, and hospice team all reporting to one director. The program focuses on preventing disease, managing chronic conditions, patient-oriented goals, and end-of-life care. The team is co-located and participates in multi-disciplinary rounds to provide seamless transitions of care for patients participating in the program.

Rural health care organization: A health care organization located in rural geography (American Hospital Association [AHA.org], n.d.).

Social determinants of health: Conditions where people live and work that affect health, quality of life, and outcomes (CDC, 2019).

Transition of care: The transition or movement of a patient from one care setting to another (i.e., hospital, ambulatory primary or specialty care, long-term care, home, rehabilitation facility) (CMS, n.d.).

Unplanned readmission: An unplanned readmission occurs within 30 days of discharge from the index hospitalization, no matter the principal diagnosis, which may occur at the same hospital or any other acute care hospital (Medicare.gov, n.d.).

Vizient Inc.: A performance improvement company that assists health care organizations in enhancing the quality of care, growth strategy, and expense management enhanced through partnerships and member insight. Vizient provides a format for strategic growth, operations and quality, supply chain, and pharmacy improvement (Vizient Inc.com, n.d.).

Assumptions

It was assumed that the 30-day readmission rates used in this study, as collected by the rural health care organization and submitted to the Vizient Clinical Database, are accurate. It was also assumed that the Vizient data, specific to Medicare patients 65 years of age and older, is an accurate predictor of heart failure and COPD readmission rates for individuals who fall outside of that specific age group. While the Vizient database allows for comparison to community hospitals and academic medical facilities across the country, the data were specific to this rural health care organization. Furthermore, it was assumed that the variables within this study are independent of each other, which will allow for an accurate statistical analysis.

Scope and Delimitations

The scope of this study was limited to the data submitted to the Vizient database from the study's rural health care organization. The scope was also limited to the impact pre- and post-implementation of an integrated care transitions program on the

readmission rates of Medicare heart failure and COPD patients within 30 days of discharge. The focus on readmissions by CMS increases the transparency of hospital care, provides data for health care consumers to choose an appropriate care delivery model, and assists hospitals in quality improvement (CMS, n.d.). The results of this study call attention to the impact of an integrated care transitions team on heart failure and COPD readmission rates. The secondary data presented was without manipulation or interpretation.

Limitations

One of the limitations of this study was the geographic location of the study's health care organization. According to the American Hospital Association (n.d.), in 2021, there were 1,805 rural hospitals and 3,336 urban hospitals in the United States. The geographic location determines the available resources in the community and within the health care organization and the social determinants of health the community experiences.

Another challenge was the integration of a care transitions program focused on the various transition of care from the prevention of disease through hospice under one reporting structure. This challenge may be due to the organization's size and organizational structure, which may not support varying reporting structures. The differences in reporting structure and lack of coordinated efforts of the team may affect the overall program's success and negatively impact the transitions of care.

Significance

This study explored the impact of an integrated care transitions model on the 30-day readmission data for heart failure and COPD patients as submitted to the Vizient Clinical Database. Rural health care facilities may have a comparative advantage over urban health care organizations due to the ability to create innovative programs such as an integrated care transitions program, reducing readmission rate for heart failure and COPD patients. Each year, 2.6 million senior citizens are readmitted within 30 days for a cost of $26 billion; CMS has identified the critical contributors to readmission prevention as not only hospitals but downstream providers as well (CMS, n.d.). This study may assist other rural health care organizations to determine if an integrated care transitions program may improve readmission rates for heart failure and COPD patients within their setting. Several factors such as health literacy, transportation, attendance at post-discharge appointments, and lack of care coordination could increase readmission rates. The findings of this study will assist health care administrators in determining the impact of an integrated care transitions program from prevention of disease through hospice on readmission rates and outcomes. Creating an integrated care transitions team may promote increased quality of care, decrease 30-day readmission rates, reduce financial penalties under the HRRP, and enhance the delivery of patient-centric care.

Summary

Patients continue to experience readmissions for heart failure and COPD despite the numerous interventions and care delivery models developed since the HRRP went into effect. As our population ages in the United States and patients are challenged with

numerous social determinants of health, health care organizations must develop new approaches to address the prevention and management of chronic disease across the care continuum. Health care organizations must engage with community partners and agencies to ensure patients can access health care services while addressing their social challenges, which lead to readmissions. The secondary data, retrieved from Vizient, demonstrates the impact of an integrated care transitions program on the 30-day heart failure and COPD readmission rates in a rural health care organization.

Although other researchers have attempted to examine the many causes of readmissions and prevention measures, none have been identified to have explored the relationship between an integrated care transitions program and prevention of readmissions in the rural health care organizations. Therefore, this study addressed the research gap by providing an overview of the impact pre- and post-implementation of an integrated care transitions program to determine the relevance to rural health care organizations and the relationship with the prevalence of 30-day readmissions for heart failure and COPD.

Section 2: Research Design and Data Collection

In the first section of the study, I outlined the foundation of the study and the gap in the literature regarding the 30-day readmission rates for Medicare heart failure and COPD patients in a rural health care organization and the implementation of an integrated care transitions program. The dependent variable is the 30-day readmission rate for Medicare heart failure and COPD patients, and the independent variable is the pre- and post-implementation of an integrated care transitions program. The types of readmissions chosen as the covariates for this study are two disease processes associated with a high rate of readmissions. According to the CMS, one in five Medicare participants will be readmitted within 30 days of discharge due to lack of care transitions and poor quality of care resulting in an increased cost for the Medicare system (CMS, n.d.). Each patient was unique in this study, and each encounter was counted as unique. Some patients may have had multiple encounters if they present numerous times as readmits during the data gathering period. All the data were de-identified for the study.

The Donabedian model was the conceptual framework used for this study to assess the impact of implementing an integrated care transitions program in a rural health care organization measured by structure, process, and outcome (Berwick & Fox, 2016). The Donabedian model provided the foundation for determining the relationship between 30-day Medicare heart failure and COPD readmissions in a rural hospital and an integrated care transitions program. The primary purpose of this quantitative study was to determine if an integrated care transitions program in a rural health care organization affects the rate of 30-day readmissions for Medicare patients with heart failure and

COPD. Without adequate measures to prevent and address readmissions, the cost of care will continue to rise, and there will be a lack of improvement in both the health of the Medicare patient and the health of the population (CMS, n.d.).

This section highlights the research design, methodology, and data analysis. A single data source, the Vizient Clinical Database, was used to isolate the sample and then perform a statistical analysis using the appropriate tests. There was an attempt to control internal and external validity throughout the study. The results may assist health care administrators in understanding the correlation of an integrated care transitions program and 30-day readmission rates for heart failure and COPD, leading to the development and implementation of strategies to decrease readmission rates in their health care organization.

Research Design and Rationale

A quantitative, correlational design with a secondary data set from the Vizient Clinical Database was used for this study. The independent variable was an integrated care transitions program. The dependent variables included the 30-day readmission rates for heart failure patients and COPD patients. The research questions for examination were specific to the relationship between the 30-day readmission rate for heart failure and COPD patients pre- and post-implementation of an integrated care transitions program. The statistical test selected to examine and describe the relationship between the independent and dependent variables was the Chi-square. The Vizient Clinical Database was accessed after permission was granted by the rural health care organization and

Vizient and was limited to this data. The research design for this study was a quantitative approach using the secondary data set available in the Vizient Clinical Database.

Methodology

Study Population

The focus of the study was the 30-day readmission rate for heart failure and COPD patients, specific to this rural health care organization, available in the Vizient Clinical Database from 2015 through 2021. The readmission data abstracted from the Vizient Clinical Database was a segment of the overall data submitted monthly by participating health care organizations. The complete readmission data set contained information regarding the 30-day readmission rates for acute myocardial infarction, pneumonia, coronary artery bypass surgery, and elective primary total hip arthroplasty or total knee arthroplasty in addition to heart failure and COPD. The data set contained additional information such as health care organization classification, additional core measure data, location of hospitals, bed size, efficiency and effectiveness, and patient experience.

Sampling and Sampling Procedures

The Vizient Clinical Database is a health care analytic platform that has been developed to drive performance improvement across academic, community, and rural health care organizations. This transparent database provides benchmarking data specific to areas such as mortality, length of stay, hospital-acquired conditions, readmissions, and disease complications (Vizient, Inc, n.d.). This database fulfills the reporting requirements for agencies such as The Joint Commission, CMS, and state agencies.

The data sets were analyzed as pre-implementation of the Integrated Care Transitions Program during the years of 2015 through 2017 and post-implementation of the Integrated Care Transitions Program during the years of 2018 through 2021 within the study's rural health care organization. The data for this study was limited to the 30-day readmission rate for heart failure and COPD patients.

The strategy for sampling was vital to avoid the inclusion of non-Medicare patients or other reportable diagnosis readmissions such as pneumonia or myocardial infarction. The data included Medicare patients that had multiple readmissions through the period or who may have been reported in other data, such as mortality rates.

Power Analysis

I conducted a priori power analysis using a free version (3.1.9.7) of the G*Power analysis calculator to determine if the number of 30-day Medicare heart failure and COPD readmissions in this rural health care organization was sufficient to establish a significant difference at a small effect size. The results were inclusive of the sample size and predictive power. Table 1 displays the G*Power analysis of the sample size, demonstrating the statistical power to identify small effects. According to this tool, the total sample size was 94 patients to produce an alpha level of 0.05. At this rural health care organization, 464 30-day Medicare heart failure patients and 244 30-day Medicare COPD patients were discharged during the pre-implementation of the integrated care transitions program timeframe. Post-implementation of the integrated care transitions program, 250 30-day Medicare heart failure patients and 176 30-day Medicare COPD patients were discharged from this independent rural health care organization.

Table 1

Correlations: Two Independent Pearson r's

Input	Tail(s)	Two
	Effect size q	0.6
	Power (1-B err prob)	0.80
Output	Sample size Group 1	47
	Sample size Group 2	47
	Total sample size	94
	Actual power	0.8035275

Operationalization of Variables

In this study, my investigation was focused on the independent variable of an integrated care transitions program which is inclusive of the following programs: community outreach, remote monitoring, complex care management, supportive/palliative care, and hospice. The team members from this integrated care transitions programs report to one leader. The team participates in multi-disciplinary rounds, which facilitates communication, collaboration, and the transition of care of our patients from one program to another. The dependent variables for this study were the 30-day Medicare readmission rates for heart failure and COPD patients specific to this rural health care organization (Table 2).

Table 2

Data Type for Each Variable

Independent variable name	Data submission timeframe	Data type
Pre-implementation of an integrated care transition program	2015-2017	Categorical
Post-implementation of an integrated care transitions program	2018-2021	Categorical
Dependent variable name	Data source	Data type
30-day Medicare heart failure readmission rate	Vizient Clinical Database	Categorical
30-day Medicare chronic obstructive pulmonary disease readmission rate	Vizient Clinical Database	Categorical

Secondary Data Analysis Methodology

I obtained the pre- and post-implementation data for the rural health care organization from the Vizient Clinical Database, which collects and benchmarks 30-day readmission rates for heart failure and COPD Medicare patients, among other core measures. According to Areco et al. (2021), secondary health data sources support the development of preventive and therapeutic services, strategies, programs, and various health policies. The data sets selected for this study were conducive to completing an effective statistical analysis.

Statistical Analysis

I used the Statistical Package for Social Sciences (SPSS), Version 25, to analyze the secondary data set from the Vizient Clinical Database for this rural health care organization. The pre-implementation of an integrated care transitions team included data from 2016, 2017, and 2018. The post-implementation of an integrated care

transition team data included the years 2019, 2020, and 2021. The data categories included

- the total number of heart failure and COPD discharges per month

- the number of 30-day Medicare heart failure and COPD readmissions

- the calculated monthly readmission rate for the 30-day Medicare heart failure and COPD patients.

The data sample included other diagnoses that were excluded from this study; acute myocardial infarction, pneumonia, post-coronary artery bypass graft surgery, and elective primary total hip and/or total knee arthroplasty. The data set was specific to this rural independent health care organization located in Middle America, and the data were not benchmarked to other health care systems using the Vizient Clinical Database. The independent and dependent variables were not adjusted for use in this study. The analyzed data included patients who had been discharged from the organization with a primary diagnosis of heart failure or COPD who were readmitted within 30 days of the index admission. The data sets were compared for the two times periods defined as pre- and post-implementation of the integrated care transitions program.

The data analysis was completed using two statistical tests: cross-tabulation with chi-square X^2 and multiple logistic regression without manipulation of the variables. The chi-square test allowed the cross-tabulation of the data while providing the frequency distribution of each variable. The logistic regression detailed the relationship between the dependent and independent variables.

Research Questions and Hypotheses

RQ1: What is the relationship pre- and post-implementation of an integrated care transitions program on the heart failure 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America?

$H_0$1: There is no correlation pre- and post- implementation of an integrated care transitions program on the heart failure 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America.

$H_1$1: There is a correlation pre- and post- implementation of an integrated care transitions program on the heart failure 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America.

RQ2: What is the relationship pre- and post- implementation of an integrated care transitions program on the chronic obstructive pulmonary disease 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America?

$H_0$2: There is no correlation pre- and post- implementation of an integrated care transitions program on the chronic obstructive pulmonary disease 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America.

$H_1$2: There is a correlation pre- and post-implementation of an integrated care transitions program on the chronic obstructive pulmonary disease 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America.

Threats to Validity

External Validity

The data for this study were procured from the secondary database of the Vizient Clinical Database. The database was blinded and was not accessible to the public. However, the data reported to the Vizient Clinical Database populates the CMS HRRP dataset. Participating organizations within the Vizient Improvement Network are numerically identified and are grouped according to rural, academic, large community designation. Hospitals are classified according to their location and service area despite possibly being part of a more extensive health care system. The dependent variables for 30-day readmission rates are uniformly reported in accordance with the CMS guidelines and therefore should be consistent amongst all health care organizations. According to Areco et al. (2021), secondary data sets should be structured, consolidated, anonymized, and include operational manuals and variable dictionaries.

Internal Validity

Heart failure or COPD readmissions within 30-days of the initial hospitalization could be omitted by the rural health care organization and pose a validity threat to the data available through the Vizient Clinical Database. A patient may be readmitted with a primary diagnosis of heart failure, COPD, or both. If the patient is readmitted and expires within 30 days of the initial index admission, the patient will be counted in both categories of readmission and mortality. In accordance with the definition of a readmission, per the CMS, a patient that is readmitted with a diagnosis other than heart failure or COPD, such as pancreatitis, was included in this data set. Therefore, there may

be a limited number of readmissions included in this data set that would not be impacted by the implementation and interventions of an integrated care transitions program.

Ethical Procedure

The Vizient Clinical Database is a database accessible to members of the Vizient community. The data reported in the Clinical Database is also publicly reported to the CMS. The data set does not contain information specific to the patient; therefore, there were no risks for nondisclosure utilizing this data set. The data were deidentified and the data set did not contain information that identifies the health care organization. A patient may be readmitted multiple times during the reporting periods and therefore would be represented numerous times in the data. This study was completed without the use of a primary data set. The downloaded data set was limited to a private computer and was deleted after the study was completed.

Written permission to utilize the organization's data were obtained from the President/Chief Executive Officer of the organization (Appendix A). Written approval to conduct the study using data from the organization was also obtained from the hospital's Institutional Review Board (Appendix B). A formal written request was submitted to Vizient, Inc. requesting access to the specific data required for completion of this study (Appendix C). Vizient Inc., requires written approval from the organization's Clinical Data Base specialist which was obtained (Appendix D). The following forms were completed to obtain permission to the Vizient Clinical Data Base (Appendix E-I):

- Exhibit A: Vizient Data Request Application
- Terms and Conditions for Data Use Agreement

- Public Use of Vizient Data for Research or Publication

The Walden University Institutional Review Board reviewed the data, and permission was requested and granted to use this data set specific to this rural health care organization.

Summary

Throughout Section 2, the foundation was outlined for the utilization of a quantitative, correlational, cross-sectional design to explain the relationship between the pre- and post-implementation of an integrated care transitions program in this rural health care organization in Middle America and the dependent variables of the research questions. The Vizient Clinical Database was an appropriate secondary dataset as it represents over 8.5 million inpatient visits per year and includes data from more than 800 hospitals to integrate quality and cost data to drive improvement (Vizient, Inc., n.d.). The statistical tests examined the relationship between the independent and dependent variables. While there are threats to the validity of this study, the research design limited the impact when possible. The external threats were minimal because the dataset was limited to the rural health care organization. The results of this study will inform health care administrators and executives regarding the relationship of an integrated care transitions program on 30-day Medicare readmission rates for heart failure and COPD. In Section 3, the statistical findings of the data analysis and the results of the study are provided.

Section 3: Presentation of the Results and Findings

The primary purpose of this quantitative study was to determine if the implementation of an integrated care transitions model in a rural health care organization, located in Middle America, impacts the 30-day readmission rates for heart failure and COPD patients. The Donabedian framework of structural input measures, processes, and outcomes was used for this study. The data set was obtained from the Vizient Clinical Database and contained both the dependent and independent variables to analyze the relationship between an integrated care transitions model and readmission rates within the rural health care setting. The timeframe for the study was 2016-2021.

The dependent variable for the study was the 30-day readmission rates for heart failure and COPD disease, pre- and post-implementation of the integrated care transitions program, while the independent variable was the implementation of an integrated care transitions program. Excessive readmission rates result in poor patient outcomes and management, decreased quality of life for the patient, increased cost for both patient and health care organization, and a potential for financial penalty for the organization. The need to understand the relationship between an integrated care transitions program and readmission rates for heart failure and COPD could influence the strategic plan of health care administrators to reduce readmission rates in these populations. The research questions and hypotheses directed this study:

RQ1: What is the relationship pre- and post-implementation of an integrated care transitions program on the heart failure 30-day readmission rate for Medicare patients in a rural health care organization located in Middle America?

$H_0$1: There is no correlation pre- and post- implementation of an integrated care

transitions program on the heart failure 30-day readmission rate for Medicare

patients in a rural health care organization located in Middle America.

$H_1$1: There is a correlation pre- and post- implementation of an integrated care

transitions program on the heart failure 30-day readmission rate for Medicare

patients in a rural health care organization located in Middle America.

RQ2: What is the relationship pre- and post- implementation of an integrated care

transitions program on the chronic obstructive pulmonary disease 30-day readmission

rate for Medicare patients in a rural health care organization located in Middle America?

$H_0$2: There is no correlation pre- and post- implementation of an integrated care

transitions program on the chronic obstructive pulmonary disease 30-day

readmission rate for Medicare patients in a rural health care organization located

in Middle America.

$H_1$2: There is a correlation pre- and post-implementation of an integrated care

transitions program on the chronic obstructive pulmonary disease 30-day

readmission rate for Medicare patients in a rural health care organization located

in Middle America.

Section 3 of this study contains the statistical analysis completed utilizing the data

set from the Vizient Clinical Database set, namely the Mann-Whitney U and Kruskal-

Wallis tests. In this section, I provide the timeframe for data collection, the total number

of readmitted patients for the specific disease entities, any anomalies observed in the data

set, descriptive statistics, and the various populations studied. Within this section, there

is a discussion of the analysis of the sample population, followed by a summary of the results.

Data Collection of Secondary Data

Time Frame of Collection and Discrepancies in Secondary Data

I collected the data for this study from the Vizient Clinical Database containing submitted admission and readmission data for a rural health care organization in Middle America. The data included the medical record numbers of patients, the admission diagnosis, the readmission diagnosis, and the rate of readmission. No discrepancies were observed in the data except for readmissions excluded for other diagnoses. All variables from the data set that were not relevant in this study were excluded. The G*Power analysis of sample size was 94 patients, processing enough statistical power which identified small effects. The examination of the differences between small and medium patients resulted in 80% power to detect a $d = 0.6$ with an alpha level of 0.05.

Descriptive Characteristics of Sample and Population

The data consisted of 8,932 patients admitted with a diagnosis of congestive heart failure and or COPD during the years of 2016-2021 at a rural community hospital located in Middle America. The independent variable was pre- implementation of an integrated care transition program during the years 2016 and 2017 and post-implementation during the years 0f 2018, 2019, 2020, and 2021. The subset of data included 1,099 patients enrolled in the integrated care transitions program with the discharge diagnosis of either heart failure, COPD, or both diseases. The most appropriate statistical analysis method specific to this data set was identified through a test of normality assumption. Table 3

shows the frequency of readmission pre- and post-implementation of an integrated care

transitions program in a rural hospital in Middle America, as well as the frequency of

readmission per component of the integrated care transitions program (supportive care,

complex care manager, remote patient monitoring, and multiple visit patient program).

Pre- and Post-Frequency of Readmission

Table 3

Frequency Distributions Between the Groups

	Readmission status	Frequency	Percentage	Valid percentage	Cumulative percentage
Pre-implementation	No readmit	3835	83.1	83.1	83.1
	Readmit	782	16.9	16.9	100
	Total	4617	100	100	
Post-implementation	No readmit	3638	84.3	84.3	84.3
	Readmit	675	15.7	15.7	100
	Total	4313	100	100	
Supportive care program	No readmit	3676	85.2	85.2	85.2
	Readmit	637	14.8	14.8	100
	Total	4313	100	100	
Complex care manager program	No readmit	4229	98.1	98.1	98.1
	Readmit	84	1.9	1.9	100
	Total	4313	100	100	
Remote monitoring program	No readmit	4183	97	97	97
	Readmit	130	3	3	100
	Total	4313	100	100	
Multiple visit program	No readmit	4311	100	100	100
	Readmit	2	0	0	100
	Total	4313	100	100	

Test of Normality Assumption

Table 4 demonstrates that the *p* values for the Kolmogorov-Smirnov and Shapiro-Wilk test for all variables are less than a 0.05 level of significance ($p = 0.000$). These results indicate the data were not normally distributed for the pre-implementation period (2016-2018), post-implementation period (2019-2021), and the integrated care transition programs (supportive care, complex care managers, remote monitoring, and multiple visit patient). The data specific to the COPD patients enrolled in the multiple visit patient program did not result in a statistical analysis due to sample size. I used the Mann-Whitney U and Kruskal-Wallis nonparametric tests for the readmission status and the four components of the integrated care transitions program. The Kruskal-Wallis test was also used to examine the differences among both diagnoses of heart failure and COPD and the four components of the integrated care transitions program. The nonparametric statistical test reduces the risk of inaccurate conclusions as assumptions are not made about the population (Nahm, 2016). The normality test in Table 4 was used to justify the use of a nonparametric test for this study.

Table 4

Normality Test for Readmissions Between the Groups

Program	Diagnosis	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	*df*	*p*	Statistic	*df*	*p*
Supportive care program	Heart failure	0.494	2006	.000	0.482	2006	.000
	COPD	0.528	2306	.000	0.357	2306	.000
Complex care manager	Heart failure	0.536	2006	.000	0.113	2006	.000
	COPD	0.537	2306	.000	0.121	2306	.000
Remote monitoring	Heart failure	0.541	2006	.000	0.21	2006	.000
	COPD	0.535	2306	.000	0.106	2306	.000
Multiple visit patient	Heart failure	0.512	2006	.000	0.012	2006	.000
	COPD	.	2306	.000	.	2306	.000

Descriptive Statistics

The Vizient Clinical Database contains the readmission rates reported by a rural

community health care organization in Middle America through the years 2017-2021.

The results included 8,932 admitted patients with an initial diagnosis of heart failure or

COPD. All other diagnoses captured for the CMS and reported in the Vizient Clinical

Database were excluded for this study.

In the results of this study, 43% (n=3,865) of the patients admitted had an initial

diagnosis of heart failure, while 57% (n=5,067) of the patients had an initial diagnosis of

COPD. Of the heart failure patients admitted, 17% (n=663) were readmitted within 30 days, while 16% (n=793) of the COPD patients were readmitted within 30 days. The results of this study for the 30-day readmission rate pre-implementation of an integrated care transitions program for patients with an initial diagnosis of heart failure is 18%, while the overall readmission post-implementation rate is 16.4%. The results of this study for the 30-day readmissions pre-implementation of an integrated care transitions program for patients with an initial diagnosis of COPD is 16.2%, while the overall readmission post-implementation rate is 16.6%. The total results for the 30-day readmission rate of enrolled patients in the supportive care program for patients with an initial diagnosis of heart failure or COPD is 14.8%. The total results for the 30-day readmissions of enrolled patients in the complex care manager program for patients with an initial diagnosis of heart failure or COPD is 1.9%. The total results for the 30-day readmissions of enrolled patients in the remote monitoring program for patients with an initial diagnosis of heart failure or COPD is 3.0%. The total results for the 30-day readmissions of enrolled patients in the multiple visit patient program for patients with an initial diagnosis of heart failure or COPD is 0.0%. Table 5 outlines this data using a cross-tabulation Chi-Square statistical analysis.

Table 5

Cross-tabulation/ Chi-Square

			Readmit Status		
			No readmit	Readmit	Total
Supportive care					
	None	Count	3294	382	3676
		% within readmit status	90.5%	56.6%	85.2%
	Program	Count	344	293	637
		% within readmit status	9.5%	43.4%	14.8%
	Total	Count	3638	675	4313
		% within readmit status	100%	100%	100%
Complex care manager					
	None	Count	3593	636	4229
		% within readmit status	98.8%	94.2%	98.1%
	Program	Count	45	39	84
		% within readmit status	1.2%	5.8%	1.9%
	Total	Count	3638	675	4313
		% within readmit status	100%	100%	100%
Remote monitoring					
	None	Count	3570	613	4183
		% within readmit status	98.1%	90.8%	97.0%
	Program	Count	68	62	130
		% within readmit status	1.9%	9.2%	3.0%
	Total	Count	3638	675	4313
		% within readmit status	100%	100%	100%
Multiple visit patients					
	None	Count	3637	674	4311
		% within readmit status	100.0%	99.9%	100.0%
	Program	Count	1	1	2
		% within readmit status	0.0%	0.1%	0.0%
	Total	Count	3638	675	4313
		% within readmit status	100%	100%	100%

Study Results

The remaining part of Section 3 encompasses the statistical assumptions as well as the results of the statistical analysis. At the end of Section 3, the findings specific to this study related to the research questions and hypotheses will be delivered.

Statistical Assumptions

The assumption of a nonparametric test was met using the Mann-Whitney U analysis, which examined the correlation between heart failure and COPD readmissions pre- and post-implementation of an integrated care transitions program. In addition to the Mann-Whitney U, the assumption of a nonparametric test was also met using the Kruskal-Wallis test to determine the association between the four components of an integrated care transitions program and the readmission rate for heart failure and COPD patients. The Mann-Whitney test tests the null hypothesis and is the nonparametric equivalent to the 2-sample t test comparing two independent groups (Schober & Vetter, 2020). According to Schober and Vetter (2020), the Kruskal-Wallis test is the nonparametric equivalent to the one-way Anova and is used when the study involves greater than two groups. A normal population distribution was not obtained; therefore, I used the nonparametric test to determine the statistical differences of the study.

Results of Statistical Analysis for Research Question 1

I used the Mann-Whitney U test to examine the relationship between the 30-day readmission rate for heart failure pre- and post-implementation of an integrated care transitions program in a rural organization located in Middle America using a 95% confidence level. The sample size for the pre-implementation time period was 52%,

while that of the post-implementation time period was 48%. Table 6 outlines the result of

the Mann-Whitney U test of the pre-implementation time period. Table 7 demonstrates

the independent variable (implementation of an integrated care transitions program) was

statistically significant with the rate of heart failure readmissions. The result met the

determination that a significant difference is evident in the association between the

implementation of an integrated care transitions team and the 30-day readmission rate for

heart failure patients ($p < .001$) for the supportive care, complex care, and remote

monitoring programs and Mann-Whitney U test (U) = 164435.500, 262512.0, and

247269.0 respectively. The p value is less than the customary threshold of .05; therefore,

there is a valid association between the implementation of an integrated care transitions

program and the 30-day readmission rate for heart failure patients in this rural hospital

located in Middle America.

Table 6

Mann U Whitney Test- Heart Failure Readmissions Pre-implementation

	Readmit	n	%	Mean Rank	U	p
Supportive Care	None	1522	81.9	929.5	225696	1
	Readmit	336	18.1	929.5		
	Total	1858	100			
Complex Care	None	1522	81.9	929.5	225696	1
	Readmit	336	18.1	929.5		
	Total	1858	100			
Remote Monitoring	None	1522	81.9	929.5	225696	1
	Readmit	336	18.1	929.5		
	Total	1858	100			
Multiple Visit Patient	None	1522	81.9	929.5	225696	1
	Readmit	336	18.1	929.5		
	Total	1858	100			

Table 7

Mann U Whitney Test- Heart Failure Readmissions Post-implementation 2019-2021

	Readmit	*n*	*%*	Mean Rank	*U*	*p*
Supportive Care	None	1679	83.7	937.94	164435.5	<.001
	Readmit	327	16.3	1340.14		
	Total	2006	100			
Complex Care	None	1679	83.7	996.35	262512	<.001
	Readmit	327	16.3	1040.21		
	Total	2006	100			
Remote Monitoring	None	1679	83.7	987.27	247269	<.001
	Readmit	327	16.3	1086.83		
	Total	2006	100			
Multiple Visit Patient	None	1679	83.7	1003.1	273840.5	0.197
	Readmit	327	16.3	1005.57		
	Total	2006	100			

The independent sample, Mann Whitney U test displays the sample size for the pre- and post-implementation period, the frequency, and the mean ranks for the programs. Pre-implementation data has a sample size of 1,522 non-readmitted CHF patients with 336 patients readmitted. The mean rank is 929.5 for both groups. Figure 2 shows the sample size of 388 readmitted patients enrolled in the supportive care program after the implementation of an integrated care transitions program with a mean rank of 2462.43. Figure 3 demonstrated the results for the other components of the program. These results reveal that the rate of 30-day CHF readmissions was greater in the pre-implementation period than the post-implementation period.
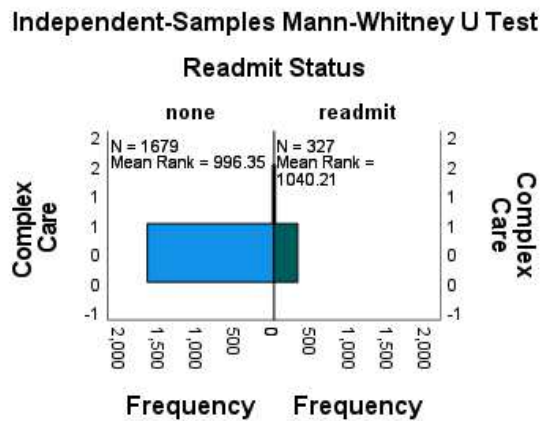
Figure 2

Independent- Samples Mann-Whitney U Test for Readmissions Supportive Care
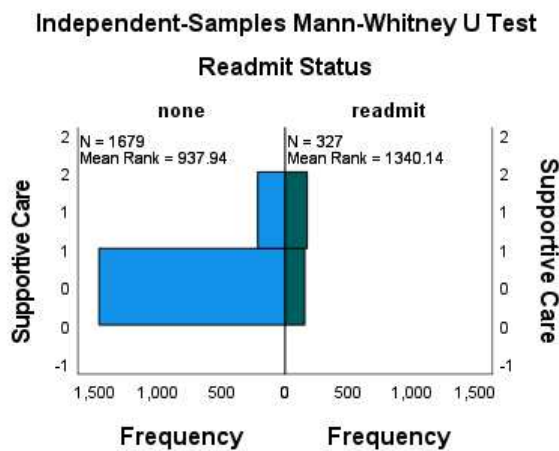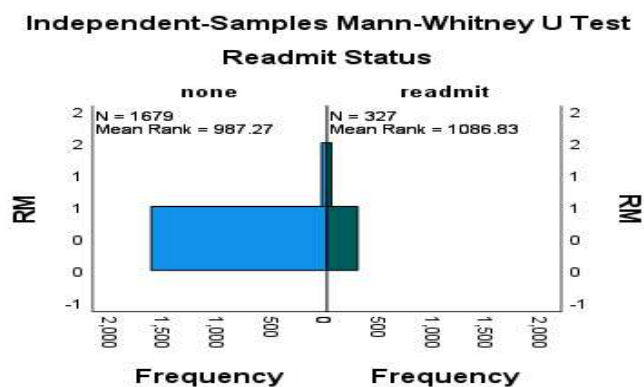

Figure 3

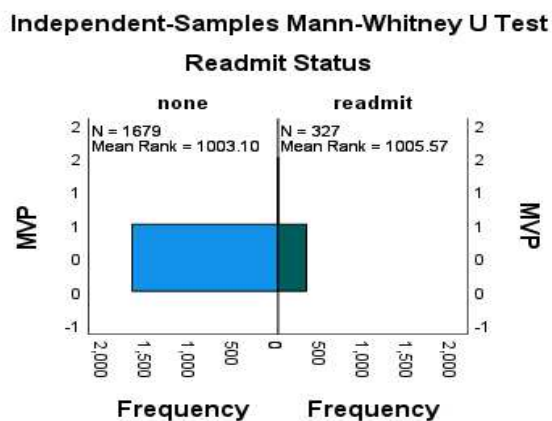*Independent- Samples Mann-Whitney U Test for Readmissions Complex Care Manager*

Figure 4

Independent- Samples Mann-Whitney U Test for Readmissions Remote Monitoring

Note: RM = remote monitoring

Figure 5

Independent- Samples Mann-Whitney U Test for Readmissions Multiple Visit Patient

Note: MVP = multiple visit patient

Summary Results of Research Question 1

Research Question 1 attempted to determine if there was a relationship between the implementation of an integrated care transitions program and the 30-day heart failure readmission rate in a rural hospital located in Middle America. The Mann-Whitney U test completed with a 95% confidence level showed the independent variable of the implementation of an integrated care transition program was statistically significant in association with the 30-day heart failure readmission rate in this location. The p value of <.001 for three of the four components of the program is statistically significant and is less than the standard of 0.05. When the four components are combined, the p value is less than 0.05. The p value for the multiple visit program is not statistically significant on its own, however, the sample size is limited. The results indicated a statistically significant difference between the implementation of an integrated care transitions program (supportive care, complex care manager, remote monitoring, and multiple visit patient) and the 30-day heart failure readmission rate for this rural hospital in Middle America; therefore, the alternative hypothesis was met, and the null hypothesis was rejected. From the analysis, I concluded that the rate of readmissions was greater in the pre-implementation period than the post-implementation period. These results align with various previous studies, such as Hardman and Newcomb (2016), who identify that fragmented care and a lack of handover amongst caregivers leads to a higher rate of readmissions.

Results of Statistical Analysis for Research Question 2

I utilized the Mann-Whitney U test to examine the relationship between the 30-day readmission rate for COPD pre- and post-implementation of an integrated care transitions program in a rural organization located in Middle America using a 95% confidence level. The sample size for the pre-implementation time period was 52%, while that of the post-implementation time period was 48%. Table 8 outlines the result of the Mann-Whitney U test of the pre-implementation time period. Table 9 demonstrates the independent variable (implementation of an integrated care transitions program) was statistically significant with the rate of COPD readmissions, except for the multiple visit program. The result met the determination that a significant difference is evident in the association between the implementation of an integrated care transitions team and the 30-day readmission rate for COPD patients ($p < .001$) for the supportive care, complex care, and remote monitoring programs and Mann-Whitney U test (U) = 164435.5, 262512, and 247269.0 respectively. The p value is less than the conventional threshold of .05; therefore, there is a valid association between the implementation of an integrated care transitions program and the 30-day readmission rate for COPD patients in this rural hospital located in Middle America.

Table 8

*Mann U Whitney Test- COPD Readmissions Pre-implementation*

	Readmit	*n*	*%*	Mean Rank	*U*	*p*
Supportive Care	None	2314	83.8	1380.5	516022	1
	Readmit	446	16.2	1380.5		
	Total	2760	100			
Complex Care	None	2314	83.8	1380.5	516022	1
	Readmit	446	16.2	1380.5		
	Total	2760	100			
Remote Monitoring	None	2314	83.8	1380.5	516022	1
	Readmit	446	16.2	1380.5		
	Total	2760	100			
Multiple Visit Patient	None	2314	83.8	1380.5	516022	1
	Readmit	446	16.2	1380.5		
	Total	2760	100			

Table 9

Mann U Whitney Test- COPD Readmissions Post-implementation

|	Readmit	*n*	*%*	Mean Rank	*U*	*p*
Supportive Care	None	1959	84.9	937.94	164435.5	<.001
	Readmit	348	15.1	1340.14		
	Total	2307	100			
Complex Care	None	1959	84.9	996.35	262512	<.001
	Readmit	348	15.1	1040.21		
	Total	2307	100			<.001
Remote Monitoring	None	1959	84.9	987.27	247269	1
	Readmit	348	15.1	1086.83		
	Total	2307	100			
Multiple Visit Patient	None	1959	84.9	1003.1	273840.5	0.197
	Readmit	348	15.1	1005.57		
	Total	2307	100			

The independent sample, Mann Whitney U test displays the sample size for the pre- and post-implementation period, the frequency, and the mean ranks for the programs. Pre-implementation data has a sample size of 2,760 non-readmitted COPD patients with 446 patients readmitted. The mean rank is 1380.5 for both groups. Figures 6, 7, 8 and 9 demonstrate the sample size of 1,959 non-readmitted patients after the implementation of an integrated care transitions program with a mean rank of 937.94 – 1,003.1, while the readmit sample size was 348 patients with a mean rank of 1005.57 – 1,340.14. These results reveal that the rate of 30-day COPD readmissions was greater in the pre-implementation period than the post-implementation period.
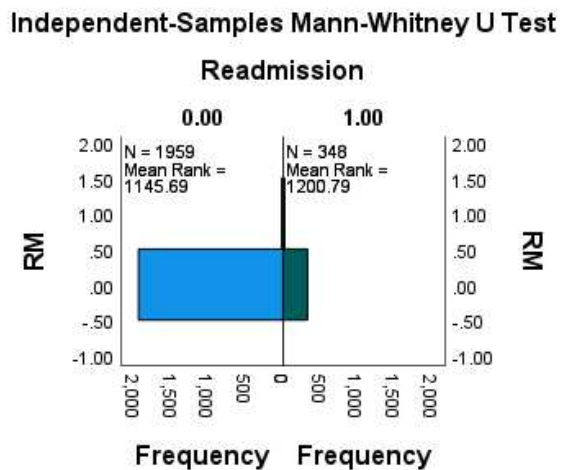
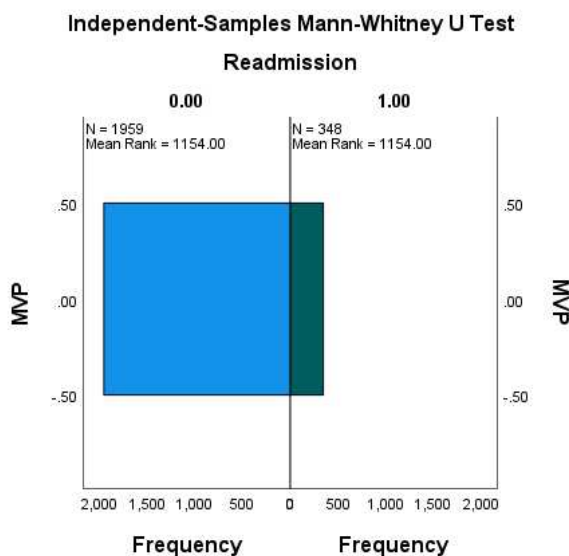**Figure 6**
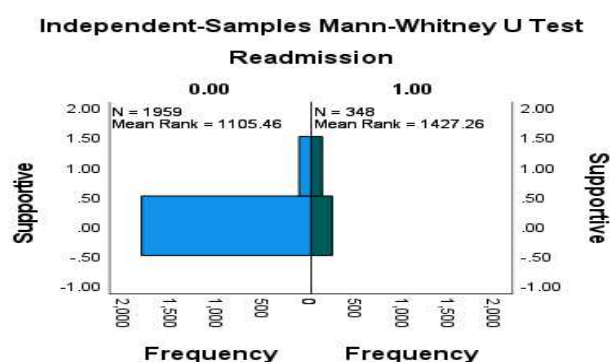
Note: Supportive = supportive care

Figure 7
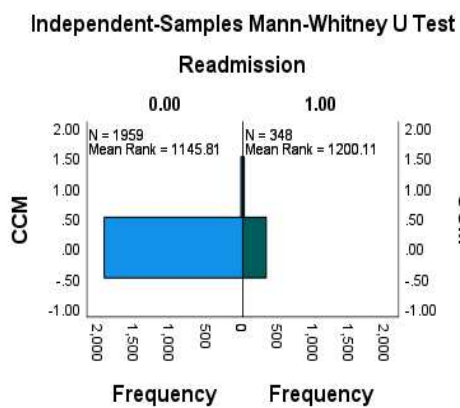
Note: CCM = complex care manager

Figure 8

Note: RM = remote monitoring

Figure 9

Independent-Samples Mann-Whitney U Test
Readmission

Note: MVP = multiple visit patient

Summary Results of Research Question 2

Research Question 2 attempted to determine if there was an association between the implementation of an integrated care transitions program and the 30-day COPD readmission rate in a rural hospital located in Middle America. The Mann-Whitney U test, 95% confidence level, revealed the independent variable, implementation of an integrated care transition program, was statistically significant in association with the 30-day COPD readmission rate in this location. The p value of <.001 for three of the four components of the program is statistically significant. When each of the four components are combined, the p value is less than 0.05. The results indicated a statistically significant difference between the implementation of an integrated care transitions program (supportive care, complex care manager, remote monitoring, and multiple visit patient)

and the 30-day COPD readmission rate for this rural hospital in Middle America; therefore, the alternative hypothesis was met, and the null hypothesis was rejected. From the analysis, I concluded that the rate of readmissions for patients with COPD was greater in the pre-implementation period than the post-implementation period. These results align with various previous studies, such as Hardman and Newcomb (2016), regarding the complexity of care coordination within the health care arena.

Results of Statistical Analysis for Covariates

The association between the implementation of an integrated care transitions program (supportive care, complex care manager, remote monitoring, and multiple visit patient) and the rate of 30-day readmission for heart failure and COPD was completed through the completion of a Bayesian Regression to identify if one component of the program was more effective than the others. The confidence level was 95% in the SPSS test. A linear relationship was established between the implementation of an integrated care transition program and the prevention of 30-day heart failure and COPD readmissions. Table 10 demonstrates the difference in results of participating in a component of an integrated care transitions program versus non-participation through Bayesian Estimates of Coefficients. The Bayesian Estimates of Error Variants and F-test Table, Table 11, found the mean score was significantly different between the pre- and post-implementation groups (p = 0.000, 95% C.I. = [.111, 0.121]. A one-way Anova, Table 12, revealed that there was a statistically significance difference between pre- and post-implementation 30-day readmission rates for both diseases (F (5,4307) = [119.6], p = 0.000). Therefore, there is a statistically significant difference in the 30-day

readmission rate in the post-implementation of an integrated care transitions program data set versus the pre-implementation data for both heart failure and COPD.

Table 10

Bayesian Estimates of Coefficients

	Mode	Posterior Mean	Variance	95% Credible Interval Lower Bound	95% Credible Interval Upper Bound
Intercept	0.482	0.482	0.058	0.009	0.954
Supportive Care None	-0.351 d	-0.351 d	0 d	-0.382 d	-0.319 d
Complex Care None	-0.04 d	-0.04 d	0.002 d	-0.135 d	0.055 d
Remote Monitoring None	-0.21 d	-0.021 d	0.002 d	-0.101 d	0.059 d
Multiple Visit Patient None	0.004 d	0.004 d	0.06 d	-0.474 d	0.483 d

Table 11

Bayesian Estimate of Error Variance and F-test Table

Parameter	Mode	Posterior Mean	Variance	95% Credible Interval Lower Bound	95% Credible Interval Upper Bound
Error Variance	0.116	0.116	0	0.111	0.121

F	df1	df2	*P*
149.25	4	4307	0

Table 12

Anova

Source	Sum of Squares	df	Mean Square	F	Sig
Regression	69.445	5	13.889	119.6	.000
Residual	499.915	4307	0.116		
Total	569.36	4312			

The results using the Bayesian Regression Model show very consistent predictions among the four components of the integrated care transitions program and readmission rates for both heart failure and COPD. The certainty of the model is demonstrated by the prior and posterior distribution remaining consistent throughout the integrated care transitions programs, Figures 10,11,12, and 13.
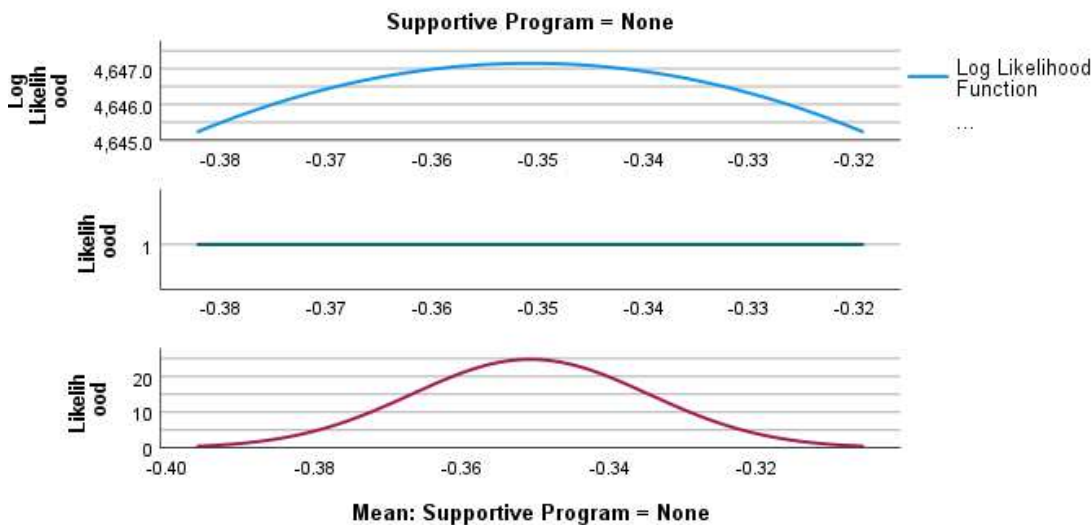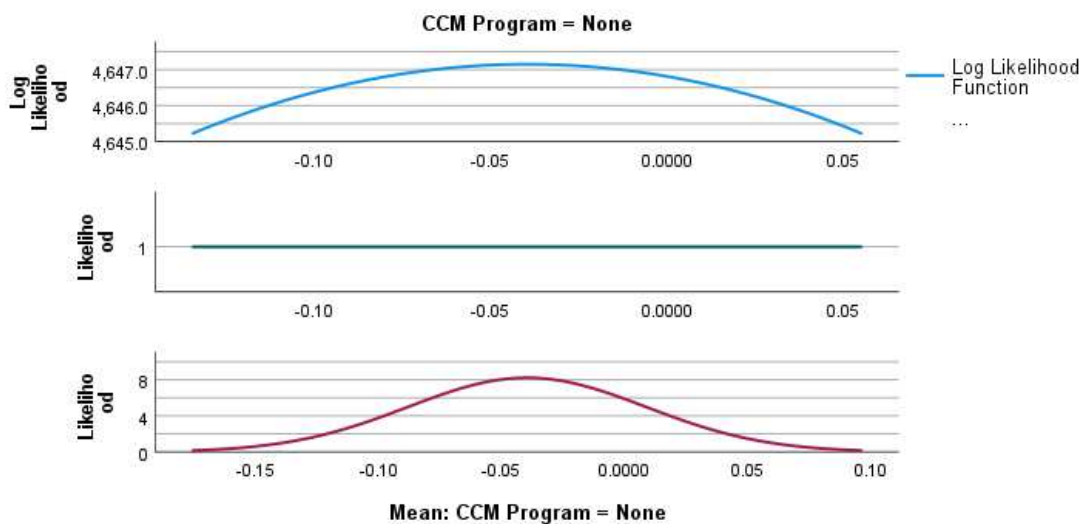
Figure 10

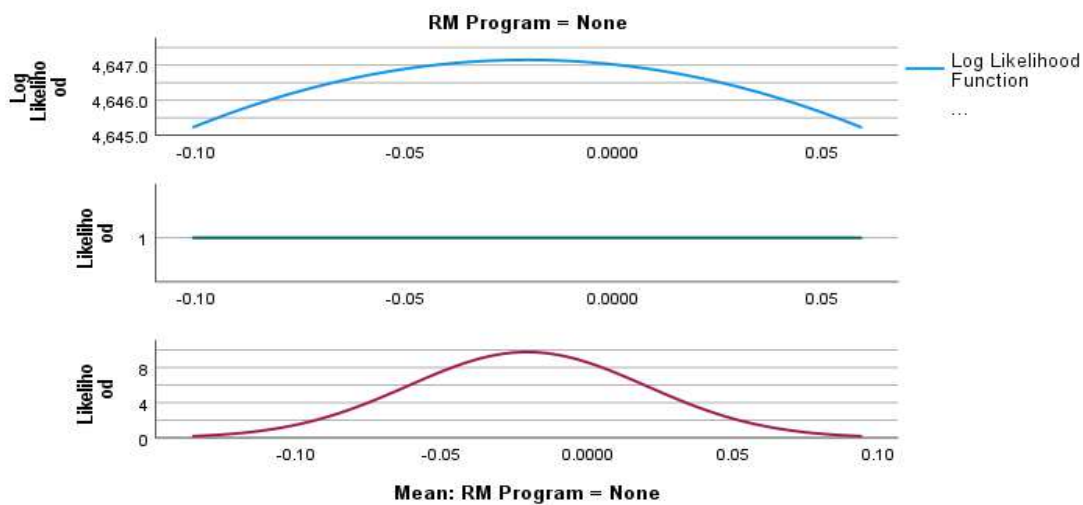*Bayesian Regression Supportive Care*

Figure 11

Bayesian Regression Complex Care Manager

Note: CCM = complex care manager
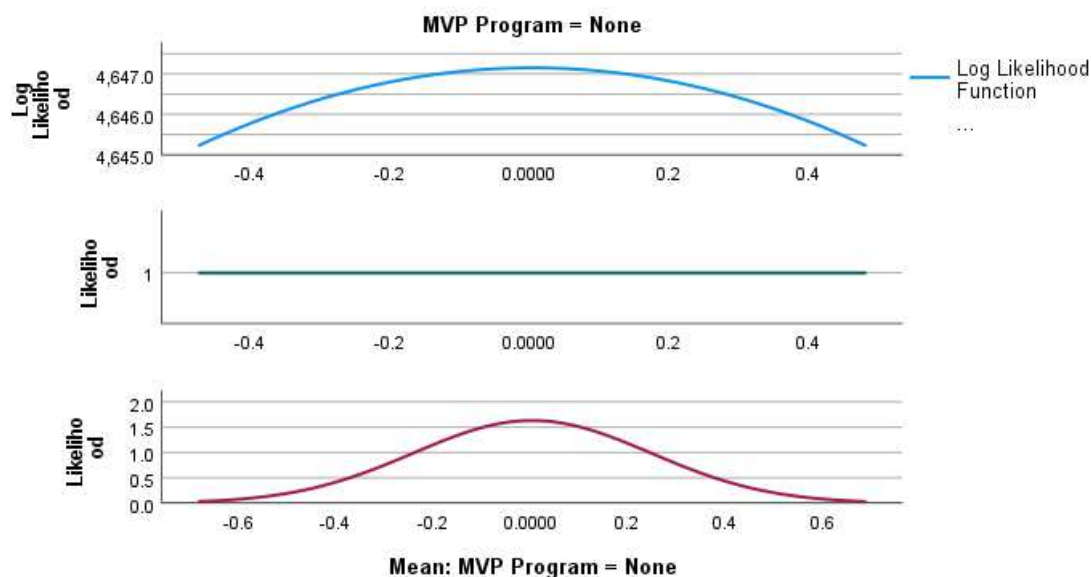
Figure 12

Bayesian Regression Remote Monitoring

Note: RM = remote monitoring

Figure 13

Bayesian Regression Multiple Visit Patient

Note: MVP = multiple visit patient

Summary Results of the Covariates

The results of the covariates answered the question of the association between the implementation of an integrated care transitions program (supportive care, complex care manager, remote monitoring, and multiple visit patient) and the rate of 30-day readmission for heart failure and COPD. A Bayesian Regression Analysis was completed, including a One-way Anova, with a 95% confidence level that demonstrated the independent variable, implementation of an integrated care transitions program, was statistically significant in association with the 30-day readmission rates for heart failure and COPD in this rural hospital located in Middle America. The *p* value of 0.000 is statistically significant. The results indicated a statistically significant correlation

between the implementation of an integrated care transitions program and the 30-day readmission rate for both diseases; therefore, the alternative hypothesis was met for both the heart failure and COPD research questions, and the null hypothesis was rejected.

Summary of Research Questions Results and Hypotheses

The results of Research Question 1, which attempted to establish a correlation between the implementation of an integrated care transitions program and the 30-day readmission rates for heart failure, in a rural hospital located in Middle America, showed that the *p*-value = .000 is statistically significant. The results indicated a statistical significance between the two variables; therefore, the alternative hypothesis was accepted, and the null hypothesis was rejected. The results of Research Question 2, which attempted to establish a correlation between the implementation of an integrated care transitions program and the 30-day readmission rates for COPD, in a rural hospital located in Middle America, showed that the *p*-value = .000 is statistically significant, less than 0.05. Once again, the results indicated a statistical significance between the two variables; therefore, the alternative hypothesis was accepted, and the null hypothesis was rejected.

Summary

Section 3 included the results and the findings of this study while outlining the data collection process, the results from various descriptive statistics, and the Mann-Whitney U statistical method and Chi-square utilized to determine the association of an integrated care transitions program in a rural hospital in Middle America and the 30-day readmission rate for heart failure and COPD patients. This section also examined and

displayed the results and determined the association between the implementation of an integrated care transitions program and heart failure and COPD 30-day readmissions through a Bayesian Regression Analysis, including a one-way Anova. This doctoral study helped to establish the consistency of results in the covariates, showing the decrease in heart failure and COPD readmissions after the implementation of an integrated care transitions program in a rural hospital located in Middle America.

In Section 4, the examination, interpretation, and findings specific to the research questions and results is provided. Section 4 is the incorporation and interpretation of the Donabedian conceptual framework on the findings of this study. The section includes the limitations, recommendations, and concluding parts of this doctoral study.

Section 4: Presentation of the Results and Findings

The main objective of this quantitative study was to address the gap in research regarding the correlation between the implementation of an integrated care transitions program (supportive care, complex care manager, remote monitoring, and multiple visit patient) and the 30-day readmission rates for heart failure and COPD patients in a rural community hospital located in Middle America. The results from the Mann-Whitney U and Bayesian Regression analyses, including one-way Anova, indicated a statistically significant difference in the rate of readmission pre- and post-implementation of an integrated care transitions program. The results demonstrated that the multiple-visit patient program was not as impactful on the readmission rate as the other components of the integrated care transitions program. The findings reaffirmed that the rate of 30-day readmission for heart failure and COPD is predicated on implementing an integrated care transitions program.

I provided in Section 4 the interpretation of the study's findings, limitations, and my recommendations for future research. The concluding part of this section discusses the study's relevance regarding an organization's approach to readmission prevention and social change. I focused on the incorporation of the Donabedian framework for quality care: structure, process, and outcome.

Interpretation of Findings

Research Question 1 Analysis

The study findings showed a significant association between the implementation of an integrated care transitions team (supportive care, complex care manager, remote

monitoring, multiple visit patient) and the 30-day readmission rate for heart failure

patients in this rural community hospital located in Middle America. The results reveal *p*

= <.001except for the multiple visit patient component where *p* = .197. The combined

results demonstrated that the 30-day readmission rate for heart failure patients in this

rural community hospital located in Middle America was reduced after implementing an

integrated care transitions program; therefore, the null hypothesis was rejected.

The data set results demonstrated that there was a significant association between

the implementation of an integrated care transitions program and the reduction in 30-day

readmission for heart failure patients. Although no previous studies indicated an

association in the reduction of 30-day heart failure readmissions after implementing an

integrated care transitions program, other studies have demonstrated the association

between poor care transitions and the negative impact on readmission rates. A variation

exists in the 30-day readmission rates for heart failure patients based on length of stay,

comorbidities, size of the hospital, and access to post-discharge care (Arora et al., 2017).

The results of this study align with the research of Arora et al. (2017), which affirmed

that the rate of readmissions requires strategic intervention to identify the determinants of

readmission and to develop practical approaches to deliver quality care across the

transitions of care. Douthit et al. (2015) identified the specific challenges in rural areas

that require enhanced provision of services, comprehensive care delivery, enhanced

insurance coverage, and health care providers committed to health promotion. Efforts to

reduce readmission rates specific to heart failure require post-discharge support, access to

resources, and assistance for the patient and family in navigating the health care system

(Geiger et al., 2021). The current study revealed that the 30-day readmission rate for heart failure patients was reduced after implementing an integrated care transitions program.

Research Question 2 Analysis

The study findings showed a significant association between the implementation of an integrated care transitions team (supportive care, complex care manager, remote monitoring, multiple visit patient) and the 30-day readmission rate for COPD patients in this rural community hospital located in Middle America. The results reveal $p =$ <.001except for the multiple visit patient component where $p = .197$. The combined results demonstrate the 30-day readmission rate for COPD patients in this rural community hospital located in Middle America is reduced after the implementation of an integrated care transitions program; therefore, the null hypothesis was rejected.

The data set results demonstrate that there was a significant association between the implementation of an integrated care transitions program and the reduction in 30-day readmission for COPD patients. According to Herzig et al. (2016), the patient is most vulnerable during transitions of care, requiring effective communication and care coordination among all disciplines. Although no other researchers have attempted to indicate an association in the reduction of 30-day COPD readmissions after implementing an integrated care transitions program, other studies have demonstrated the association between health care disparities, poor care transitions, and the negative impact on readmission rates. The research conducted by Naylor et al. (2017) identified eight components of a care transition program: patient education, caregiver education,

medication management, patient engagement, caregiver engagement, accountability, patient and caregiver wellbeing, and care continuity. In contrast, the integrated care transitions program I used for this study included four areas of concentration: supportive care, complex care management, remote monitoring, and multiple-visit patient programs, which resulted in a reduction in the 30-day readmission rate for COPD patients.

Analysis of Covariates

The results demonstrated a correlation between the implementation of an integrated care transitions team and the reduction in the readmission rate for heart failure and COPD patients, with $p = 000$, which is less than the accepted threshold of 0.05. The covariates revealed that the 30-day readmission rate for heart failure and COPD patients was higher in the multiple-visit patient component of the integrated care transitions program. The other components of the integrated care transitions program (supportive care, complex care manager, remote monitoring) demonstrated lower 30-day readmission rates for heart failure and COPD patients in this rural community hospital in Middle America. The results indicated a statistically significant relationship between the implementation of an integrated care transition program and the 30- day readmission rates for heart failure and COPD; therefore, the null hypothesis was rejected.

However, exploring the differences among the four components of the integrated care transition program at this rural community hospital in Middle America revealed a difference in the results specific to the multiple-visit patient program. This program also had the fewest participants within the data set. I observed no significant difference on 30-day readmission rates for heart failure or COPD patients enrolled in the multiple-visit

patient program ($p =$.197); therefore, the null hypothesis failed to be rejected. A

significant difference in the 30-day readmission rate for heart failure and COPD was

established when the program's four components were combined, $p = $ .000; therefore, the

null hypothesis was rejected.

Findings of the study

The findings of this study reiterated the need for hospitals to embrace evidence-

based practices and operational processes to minimize the 30-day readmission rates for

heart failure and COPD patients. The results demonstrated a significantly reduced

readmission rate post-implementation of an integrated care transitions program in a rural

community hospital in Middle America, which may be attributed to patient population,

demographics, or the organization's size. These topics were outside of the scope of this

study. The findings demonstrated that the collective data for all components of the

program enhanced the reduction of readmission, which calls for further expansion of the

program to reduce the overall readmission rate in this rural community hospital in Middle

America. Incorporating additional quality metrics specific to the integrated care

transitions program would allow health care professionals to incorporate additional

strategies to address the Quadruple Aim of reducing cost, improving the health of the

population, enhancing the patient experience, and caregiver well-being. Furthermore,

examining the disease processes with a high rate of 30-day readmission rates is

imperative to implementing necessary components of an integrated care transitions

program. The following subsection is dedicated to the findings of the independent

variable concerning the pre-and post-implementation of an integrated care transitions program in a rural community hospital in Middle America.

Foundational Theory

Numerous researchers have explored various approaches to reduce readmissions for heart failure and COPD, but few have attempted to determine the association between components of a care transitions program within rural community hospitals in Middle America. The framework for this study was based on the Donabedian model, which incorporates structure, process, and outcomes specific to improving the quality of care. Throughout my literature review, I was not able to identify any similar approach to the reduction of readmissions. According to Binder et al. (2021), applying the Donabedian model concept demonstrates the synergistic relationship of structure, process, and outcome in health care quality.

Improving the quality of care by reducing the 30-day readmission rates for heart failure and COPD patients is critical for patient-centered care and the reduction of costs for patient and health care organization. The structure variables (supportive care, complex care manager, remote monitoring, multiple patient visit programs) employed to determine the results of this study may be used to yield process improvements leading to the attainment of quality of care. This analysis suggested that the rate of 30-day readmissions for heart failure and COPD patients in this rural community hospital located in Middle America was reduced post-implementation of an integrated care transitions program, which provides information to health care administrators to apply when examining the various process and approaches to reduce readmissions in these settings.

Limitations of the Study

I identified limitations regarding using the data set from the Vizient Clinical Data Base which impacted the study finding's generalizability, reliability, and validity. I used data sets containing the 2016-2021 heart failure and COPD admissions and 30-day readmissions from the Vizient Clinical Database for this rural community hospital located in Middle America. Within the prospectus and proposal, the independent and dependent variables for this study were outlined. The data set for the rate of readmissions in this rural community hospital located in Middle America for the years 2016-2021 were not assessed before the study began; therefore, I proposed using cross-tabulation, chi-square, and multiple regression. After the appropriate steps of submitting and receiving approval from the Walden University IRB, the data set was downloaded, and the initial statistical analysis was conducted. The variables were not evenly distributed; therefore, I used a nonparametric test, Bayesian Regression, for the study.

The 30-day rate of readmissions in health care facilities is a reporting requirement per the CMS requirements, under the auspices of the Deficit Reduction Act of 2005 and the HRRP under the Affordable Care Act. One limitation identified in this study was the exclusion of the other required 30-day readmission diagnoses of acute myocardial infarction, pneumonia, coronary artery bypass graft, total hip arthroplasty, and total knee arthroplasty. Many health care organizations are questioning the accuracy and validity of the CMS HRRP due to incomplete documentation and fundamental flaws (Clements, 2019).

Another limitation of the study was that this rural community organization's integrated care transitions program comprises six programs (community outreach, complex care managers, remote monitoring, multiple-visit patients, supportive care, and hospice). Data were not accessible for the community outreach component of the integrated care transitions program. According to DeAngelis and Lowry (2021), the philosophy of hospice care and the patient goals do not align with admission or readmission into the hospital setting. Therefore, the study did not include the data from this organization's hospice patients.

The results of the current study were based on the 2016-2021 heart failure and COPD 30-day readmission rates within this rural health care organization located in Middle America; therefore, the results may not represent the rate of readmissions in all hospitals in other locations. I also only explored the association between the 30-day readmission rates for heart failure and COPD and the integrated care transitions program at this rural health care organization. Data were not incorporated from the other readmission diagnoses, outside health care organizations, including those within urban settings, which may skew the results.

Recommendations

The limitations of this study highlighted the need for future researchers to explore various issues related to the prevention of readmissions, such as other successful components of care transitions programs and readmission rates specific to all 30-day readmission diagnoses reported to CMS. Further studies may also limit the data set to those patients readmitted within 30-days for the same diagnosis versus any diagnosis or

condition, as CMS defines readmission. Furthermore, I recommend that future research expands the scope of the research to other health care organizations across the United States to determine the feasibility and impact of the implementation of an integrated care transition program on their 30-day readmission rates. This research expansion may highlight similarities or different practices within care transition programs that reduce readmission rates.

My recommendations for future research include a blinded study across the members of the Vizient Clinical Database to identify trends in data or best practices. As a company focused on health care performance and improvement, the results could be disseminated across the member base to impact patient care across many health care populations positively.

Implications for Professional Practice and Social Change

The negative impact on the patient's life (physically, socially, mentally, and financially) and the financial penalty associated with readmission rates demands strategic approaches to minimize the 30-day readmission rate for heart failure and COPD patients. The need for health care administrators to implement strategies to reduce readmissions, improve patient-centered care, reduce the financial burden for patients and organizations, and to address health care disparities is imperative. The impact on quality care, financial burdens, and the impact of fragmented care are incentives for health care organizations to identify care transition programs to reduce readmission rates (Pugh et al., 2021). According to Pugh et al. (2021), it is essential for health care organizations to

consistently implement evidence-based practices and multiple care transition processes, with an emphasis on bridging care from the inpatient unit to the home.

Professional Practice

Readmissions are a substantial challenge in health care, and the need to adopt the necessary strategies to reduce the readmission rate across all disease entities and patient populations is important. According to Yu and Rouse (2017), 30-day readmission rates are frequently impacted by patient demographics, socio-demographics, comorbidities, available resources, location and size of health care setting, and patient engagement. It is critical for health care administrators to understand the risk factors associated with 30-day readmission rates specific to their patient population to determine the most appropriate strategies the organization should utilize to minimize the rate of readmissions. A collaborative approach between the frontline clinical staff and providers, all members of the care transitions team, health care administrators, and community agencies is needed to reduce 30-day readmission rates in health care facilities.

Positive Social Change

Readmissions are a significant concern for hospitals due to associated factors, such as financial penalties, increased use of resources (staff, equipment), and increased risk for health care-acquired conditions. In this study, I discovered an association between the 30-day readmission rates for heart failure and COPD patients and the implementation of an integrated care transitions program in this rural health care organization in Middle America; therefore, health care administrators should identify and

implement the needed resources to address the prevalence of readmissions in other communities and disease specific populations. According to Wan et al. (2017), the following attributes are associated with readmission rates: demographics, discharge status, health care system factors, access, and geographical distance to the hospital. This study's results could lead to additional interest in conducting studies that explore the differences in the various components of a care transition program, tactics to prevent readmissions in various geographical settings and different health care organization sizes, and if an integrated care transitions program is appropriate for their organization. Further research may lead to patient-centered approaches to improve health care through the reduction of 30-day readmissions for heart failure and COPD.

Conclusion

This study revealed a statistically significant association between implementing an integrated care transitions program and the reduction of 30-day heart failure patients in a rural community hospital located in Middle America. The study also demonstrated a statistically significant association between the implementation of an integrated care transitions program and the reduction of 30-day COPD patients in a rural community hospital located in Middle America. An examination of the covariates in the study revealed an association between the four components of the integrated care transitions program (supportive care, complex care manager, remote monitoring, and multiple-visit patient) and the 30-day readmission rate for both heart failure and COPD patients in this rural health care organization located in Middle America.

The study did have limitations, such as the data set being limited to one health care organization and two disease processes. Further research is recommended to examine the association of integrated care transition programs within other health care organizations to comprehensively determine the association between the program and the rate of 30-day readmissions for heart failure and COPD. Determining the association between the implementation of an integrated care transition program and all disease processes outlined in the HRRP may identify gaps in practices to address the prevention of readmissions.

The current study may guide health care administrators and leaders of care transition programs to understand the importance of an integrated care transitions program and the rate of 30-day heart failure and COPD readmissions. As health care administrators incorporate readmission prevention and integrated care transition models into their strategic plan, the factors contributing to 30-day readmission rates will be identified and addressed, leading to improved quality of care, reduction in the financial burden to the patient and organization, and enhance patient-centered care.

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Appendix A: Letter of Approval to Access Data From Organization's President/CEO

March 2, 2022

Walden University
Center for Research Quality for the DHA Program

To whom it may concern,

I, President/CEO, give Walden student permission to access and utilize data collected and submitted to the. database specific to 30-day readmissions at health care organization to utilize for her capstone project with Walden University in partial fulfillment of her Doctorate of Healthcare Administration.

If you have any questions or need additional information, please do not hesitate to contact me at the number listed below.

Sincerely,

Appendix B: Letter of Approval From Organization's Institutional Review Committee

<div align="right">Institutional Review Board</div>

3/2/2022

Study Title: The Impact of an Integrated Care Transition Program on 30-day Readmission Rates for Heart Failure and Chronic Obstructive Pulmonary Disease

The Institutional Review Board (IRB) reviewed your application to utilize secondary data specific to hospitalized patients from 2015-2021 to perform a statistical analysis to determine the impact of the implementation of an integrated care transitions program specific to this healthcare organization. The study complies with the proper consideration of the rights and welfare of human subjects and the regulatory requirements for the protection of human subjects.

Any revisions in the study must be submitted to IRB for approval. Upon completion of the study, the findings should be reported out at an IRB meeting.

Sincerely,

Appendix C: Letter of Approval to Access to Vizient Data as Requested

March 11, 2022

To whom it concerns,

I, Quality Analyst, give authorization for Walden student to utilize data submitted to the data base.

Quality Analyst

Appendix D: Letter Requesting Vizient Data Access

March 1, 2022

Walden University
Center for Research Quality for the DHA Program

To whom it may concern,
I am requesting permission to utilize the data submitted by our organization into the database to complete my capstone as a partial requirement to the Doctorate of Healthcare Administration program at Walden University. The data for the study is specific to 30-day readmissions and will include data from 2015-2021 which will allow for statistical analysis of data pre and post-implementation of an integrated care transitions program. The data to be accessed is only specific tour organization and will not include any comparison data from other organizations participating in the clinical database.
I have previously obtained permission from our CEO/President to utilize the data.

Thank-you for your consideration,

Appendix E: Vizient Data Request Application

EXHIBIT A
VIZIENT DATA REQUEST APPLICATION

Section A: Principal Investigator and Data User Information:

Principal Investigator (PI) (Data Requestor) Name & Title: Walden Student
PI's Employing Organization & Department: Administration
PI's Telephone Number:
PI's E-Mail Address:
Data User (Sponsoring Organization, Database Licensee) if different from PI's employing organization:
Data User's Officer (VP or higher) who will approve the project:
Data User's **contact** who is authorized to receive data uploads from VIZIENT:
Contact's E-Mail Address:

Date Requested: 03/10/2022	Date Desired: 03/24/2022

File Format: □ SAS   □ ASCII   ☐ Excel   □ Word   □ Text

Section B: Reason for Data Request:

☐   Research interest within organization

☐   Research interest among multiple organizations

X   Other (Please Describe) Capstone project in partial fulfillment of Doctor of
Health Care Administration

Appendix F: Section C: Description of Project

<u>Section C: Description of Project</u>:

1. Description/title of the project: The Impact of an Integrated Care Transitions Program on 30-day Readmission Rates for Heart Failure and Chronic Obstructive Pulmonary Disease

2. Purpose and significance of the project: The purpose of this study is to examine the impact of an integrated care transitions program on the 30-day readmission rates for heart failure and chronic obstructive pulmonary disease within an independent rural community healthcare organization. The two research questions include: What are the relationships pre- and post-implementation of an integrated care transitions program on the heart failure 30-day readmission rate for Medicare patients in this organization? What are the relationships pre- and post-implementation of an integrated care transitions program on the chronic obstructive pulmonary disease 30-day readmission rate for Medicare patients in this organization? The independent variables include pre-and post-implementation of an integrated care transitions program at a rural community hospital. The dependent variables include the readmission rates for heart failure and chronic obstructive pulmonary disease during the specified time frame. Multivariate multiple regression will be utilized to analyze the data. For this study, the Donabedian Model will be used to examine structure, process, and outcomes. The key results will be identified and outlined at the end of this study. This study promotes social change by providing a care transitions framework that may reduce readmission rates of heart failure and chronic obstructive pulmonary disease patients while decreasing cost and providing patient-centered care in the rural community settings.

3. Proposed Study Period: 1/1/2016- 12/31/2021

4. Proposed Study Cohort:

-   Inclusions: CHF and COPD readmission patients

- Exclusions: AMI, pneumonia, post-CABG, elective primary total hip and/or total knee arthroplasty readmission patients

5. Personnel – Please list all persons (e.g., staff, subcontractors, affiliated agencies) who will have access to the confidential data.

6. A condition of the license agreement between database (CDB/RM, CPSC) participants and Vizient regarding the use of the data for research (and publishing) is that authors must submit all abstracts and manuscripts to Vizient for review PRIOR to submission for consideration for presentation or publication.

   In addition to Vizient staff reviewing your manuscript, how else do you anticipate VIZIENT staff participating in this study?
   (VIZIENT will provide a description of any VIZIENT fees to support the project.)
   X Provide data
   □ Provide study design expertise
   □ Support analysis
   X Other (Please describe: Offer any suggestions on different data sets if applicable)

7. IRB approval received   □Yes   □No X Not required
   If YES: Please include the current documentation of the IRB approval for the project.

8. Attach letter of support from an officer of the data user (VIZIENT member licensee).

9. If applicable, list source(s) of funding and duration of funding for the project. NA

Section D:
VIZIENT DATA USE POLICIES & DATA DESTRUCTION:
X   I/We have read and understand VIZIENT policy governing the public use of data and information in research (Exhibit B).
X   I/We have read and understand VIZIENT policy governing public use of VIZIENT data and information for promotional use (Exhibit B).

X   I/We agree to only use the data requested for the sole purposes of the project outlined above.

X   I/We agree to provide a copy of the finished product (e.g. posters, slides, published materials) to Vizient.

REQUESTOR CHECKLIST:

☐ Data request application

☐ IRB Documentation if required

☐ Letter of support from data user's officer

☐ Funding documentation

Appendix G: Terms and Conditions for Data Use Agreement

vizient

Terms and Conditions for Data Use Agreement

The terms of this Agreement are consistent with the Vizient's expert determination regarding the use of data. Please note that the language contained in this Agreement cannot be altered in any form.

This agreement (Terms and Conditions, or Agreement) is being entered into by and between Vizient, Inc., on its own behalf and on behalf of Vizient Inc., and FHN ("Data User")(Heather Spengler), and is being provided to the individual named below on behalf of the Member.

RECITALS

A. Data User has requested data, for the purpose of, and in the form of the data elements set forth in Exhibits A and A-1, attached and incorporated into this Agreement (the "Data").

B. Data User is an existing member under license with Vizient for Vizient's Clinical Data Base and/ or the AAMC/Vizient Clinical Practice Solutions Center.

C. Vizient and Data User acknowledge that the Data, which is proprietary to Vizient, has been expert determination de-identified within the meaning of 45 CFR 164.512(b) pursuant to an opinion which imposes terms and conditions upon the use, maintenance and disclosures of said data under the federal Health Insurance Portability and Accountability Act of 1996 and its implementing regulations (45 C.F.R. §§160–164) ("HIPAA").

In consideration of the foregoing, and for the release of the Data to Data User, Data User agrees as follows:

1. Data User agrees to limit its use of the Data to the purpose provided on Exhibit A, attached to this Agreement and incorporated into the Agreement, and for no other purpose.

2. Data User agrees that the purpose described on Exhibit A is limited to public health, health care operations, and/or research as those terms are defined under HIPAA.

3. Data User represents that the individual Data User accessing the Data named below is authorized to access data under Vizient's license agreement(s) with Data User, and agrees to all of the terms of this Agreement.

4. The Data is confidential, and its use and disclosure is subject to Data User's license agreement(s) with Vizient as well as applicable law.

5. Data User shall not, nor shall it permit any other person or entity, to identify or re-identify, or attempt to identify or re-identify, any specific physician(s), patient(s) or individual(s) in the Data (other than Data User's own physicians or patients or family or household member(s) of its patient(s) as permitted by law and Data User's policies).

6. Data User agrees that it will not link any other data elements to the Data, (other than with respect to User's own data) without obtaining an expert determination that the Data, which has been statistically de-identified pursuant to an expert determination, will remain de-identified consistent with all of the conditions imposed by 45 CFR Part 164.514(b).

7. Data User will implement and maintain appropriate data security and privacy policies and procedures and associated physical, technical and administrative safeguards as needed to

assure that the Data is accessed only by authorized personal and will not be used or disclosed other than as permitted by this Agreement or as otherwise required by law.

8. Data User will immediately notify Vizient in writing of any use or disclosure of the Data that is in violation of this Agreement, or in violation of any federal or state privacy laws or regulations, including but not limited to HIPAA.

9. Third party access to the Data is restricted as provided under Vizient's license agreement(s) with Data User. Any third party consultant permitted access to the Data under the license with Vizient must be properly informed of the data use conditions found in this Agreement in writing, and must execute agreements that include the restrictions found in this Agreement and any license with Vizient.

10. Publication of materials is subject to Vizient's Public Disclosure Policy Statement Governing the Public Use of Vizient Data and Information in Research, attached as **Exhibit B** to this Agreement. Publication can include any written or verbal materials presented inside and outside its membership, posters, electronic materials, Internet publication, as well as articles for publications in journals, etc. All publications must be reviewed by Vizient prior to submission in accordance with the attached Policy Statements.

11. This Agreement shall terminate no later than 6 months after date of publication or presentation of the results of research. Upon termination, Data User shall return all Data, including copies, in its possession and and/or in the possession of any third parties via a secure process approved under HIPAA current guidance for data in motion, or at Vizient's option, destroy the Data in accordance with HIPAA guidance as to destruction of Protected Health Information.

12. The Data may include content licensed from the American Medical Association (AMA), including CPT codes ("AMA Content"). AMA Content is copyrighted by the AMA and CPT© is a registered trademark of the AMA. The license to use AMA Content granted under this Data Use Agreement is a nontransferable, nonexclusive license for the sole purpose of internal use. Data User is prohibited from publishing, distributing via the Internet or other public computer based information system, creating derivative works, transferring, selling, leasing, licensing or otherwise making available to any unauthorized party any AMA Content, unless such rights are obtained by the Data User outside of this Data Use Agreement.

Each of the undersigned, Data User, and the individual authorized by Data User to access data, agree to all of the above terms as of the dates signed below.

Data User (Member name)

EXHIBIT A

Use of /Purpose for Data:

Capstone project in partial fulfillment of DHA

_____

_____

_____

Data Elements of Data Set (attached as exhibit A):

The purpose of this study is to examine the impact of an integrated care transitions program on the 30-day readmission rates for heart failure and chronic obstructive pulmonary disease within an independent rural community healthcare organization. The two research questions include: What are the relationships pre- and post-implementation of an integrated care transitions program on the heart failure 30-day readmission rate for Medicare patients in this organization? What are the relationships pre- and post-implementation of an integrated care transitions program on the chronic obstructive pulmonary disease 30-day readmission rate for Medicare patients in this organization? The independent variables include pre-and post-implementation of an integrated care transitions program at a rural community hospital. The dependent variables include the readmission rates for heart failure and chronic obstructive pulmonary disease during the specified time frame.

Appendix H: Public Use of Vizient Data for Research or Publication

EXHIBIT B

Public Use of Vizient Data for Research or Publication (as of 5/1/2020)

Appendix I: Approval of Data Access from Vizient, Inc

Walden University
Center for Research Quality for the DHA Program

To whom it may concern,

Through license agreement with the healthcare organization and company, Walden student has permission to access and utilize data specific to 30 day heart failure and chronic obstructive pulmonary disease readmissions, collected by organization and submitted to data organization to use for her capstone/dissertation project with Walden University in partial fulfillment of her DHA degree.

Student has submitted to organization the following documents:
- Data Request Application
- Public disclosure Policy Statement- Research Use
- Final terms and conditions to be used with data use agreement

If you have any questions, please contact me at the number provided below.

Sr. Research Analytics Director