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Hospital Readmission Reduction Penalties and Chronic Obstructive Pulmonary Disease Readmissions

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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Anthony Aduro

MCOM, Barkartulah Khan University, 1990

BCOM, Bhopal University, 1988

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Healthcare Administration

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Abstract

Chronic obstructive pulmonary disease (COPD) is a serious disease that affects the respiratory system, creating poor patient outcomes. Additionally, persons with COPD have higher hospital readmission rates than other patient populations. Not only is hospital readmission indicative of poor patient outcomes, but hospital readmissions are costly to healthcare organizations as well. High readmission rates are associated with wasted resources and money, and negatively impact organizational performance. The Centers for Medicaid and Medicare Services (CMS) implemented the Hospital Readmissions Reduction Program (HRRP) to reduce the rate of avoidable hospital readmissions for diseases including COPD. However, how HRRP penalties have impacted readmission rates for COPD was unknown in some states. Using the expectancy theory as a theoretical framework, the purpose of this quantitative retrospective comparative analysis study was to examine if HRRP penalties in the fiscal year 2020 were correlated with reducing COPD readmissions at Indianapolis metropolitan hospitals in the fiscal year 2021. Data were collected from CMS' Fiscal Year 2020 HRRP Supplemental Data File and CMS' HRRP data and analyzed using linear regression analysis. Findings showed that HRRP penalties were a successful method for reducing COPD readmission in 2021, reducing healthcare costs, and promoting quality, which could help guide future policy decisions within the respective hospitals. Results could lead to positive social change as they provide more information about how to reduce unnecessary COPD U.S. hospital readmissions to increase patient quality of life and decrease costly and unnecessary readmissions.

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Dedication

I dedicate my dissertation work to my family. A special feeling of gratitude to my late parents, Ebun, and Dorcas Aduro whose words of encouragement and push for tenacity in higher academic achievement ring in my ears.

I dedicate this dissertation and give special thanks to my niece Morayo Olaitan for her bravery in donating her kidney to my late sister Aduke Aduro. Aduke died during the kidney transplant procedure. I will always appreciate your benevolence and heroism.

I dedicate this dissertation and give special thanks to my wonderful children, Vanessa, Michael, and Michelle Aduro for being there for me throughout the entire doctorate program. My nephew, Maena Ochieng for your thoughtfulness and that special note of encouragement. All of you have been my best cheerleaders.

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Table of Contents

List of Tables

List of Figures

Section 1: Foundation of the Study and Literature Review

Chronic obstructive pulmonary disease (COPD) is a serious disease that affects an individual's respiratory system (Portillo et al., 2018). Currently, COPD is the third leading cause of death worldwide (Portillo et al., 2018). In the United States, approximately 23% of patients hospitalized for COPD are readmitted to the hospital within 30 days of their hospital release (Puebla-Neira et al., 2021; Portillo et al., 2018). High hospital readmission rates for COPD patients are linked to poorer patient outcomes, including death and increased treatment costs (Puebla-Neira et al., 2021). In addition, the treatment cost for each COPD patient in the United States is $9,800 annually (Portillo et al., 2018), showing that COPD extracts a severe toll in lives loss, disease burden, and financial cost in the United States.

The Centers for Medicaid and Medicare Services (CMS, 2021a) implemented the Hospital Readmissions Reduction Program (HRRP) to reduce the rate of avoidable hospital readmissions for diseases, such as COPD. This program penalized the Medicare reimbursement rate of hospitals that had exceeded allowable readmission rates for diseases included as part of the program. However, it had yet to be examined if hospitals that received the HRRP penalty for COPD readmission reduced their rates of COPD readmission the following year.

Background

CMS (2021a) implemented the HRRP in 2012 to reduce the costs associated with high hospital readmission rates. HRRP incentivized hospital performance by reducing payments to hospitals that report excess readmissions for preventable conditions, such as COPD (CMS, 2021a). For example, Buhr et al. (2020b) found that the inclusion of COPD

into the HRRP's list of preventable conditions in 2014 was associated with reducing COPD readmissions in 2016. Similarly, Puebla-Neira et al. (2021) found that individual hospitals' rate of COPD readmission decreased after CMS announced that COPD would be included in the HRRP program. Furthermore, Press et al. (2020) found that the application of certain preventative measures created as a response to having COPD in the HRRP had reduced rates of COPD readmission at specific hospitals.

However, these researchers did not examine if hospitals that received the HRRP penalty for COPD readmission reduced their rates of COPD readmission the following year. Instead, the researchers examined if the inclusion of COPD in the HRRP had decreased COPD readmission rates overall (Buhr et al., 2020b) and at facilities that had implemented new quality improvement measures (Press et al., 2020; Puebla-Neira et al., 2021). Moreover, these researchers examined COPD readmission rates shortly after the inclusion of COPD was announced in 2014, meaning that the long-term effects of the HRRP had not been specifically examined concerning COPD readmission rates (Buhr et al., 2020b; Press et al., 2020; Puebla-Neira et al., 2021). Thus, it is currently unknown if the application of the HRRP penalty for excess readmissions of COPD patients in the fiscal year 2020 reduced rates of COPD readmission at facilities in the fiscal year 2021 (Buhr et al., 2020b; Puebla-Neira et al., 2021). This study is needed as it is currently not understood if HRRP penalties correlate with reducing COPD readmissions at individual hospitals.

Problem Statement

Researchers have associated high rates of COPD readmission with adverse patient outcomes, increased costs, and lost resources for healthcare systems, costing hospitals an

estimated $9,800 per patient annually (Portillo et al., 2018; Puebla-Neira et al., 2021). Because COPD readmission is preventable, HRRP penalties were introduced to improve patient outcomes and reduce organizational waste. The specific research problem addressed through this study was that it was not understood if HRRP penalties were correlated with reducing COPD readmissions at Indianapolis Metropolitan hospitals (Press et al., 2020; Puebla-Neira et al., 2021).

There was little literature on whether the application of the HRRP penalty for excess readmissions of COPD patients in the fiscal year 2020 reduced rates of COPD readmission at facilities in the fiscal year 2021 (see Buhr et al., 2020b; Puebla-Neira et al., 2021). Further, the impact of HRRP penalties on reducing COPD readmission rates was not well understood among individual hospitals. Thus, the gap in the literature was focused on the correlation of HRRP penalties, with a change in readmission rates for COPD patients the following fiscal year in Indianapolis-based hospitals.

Purpose of the Study

The purpose of this quantitative retrospective comparative analysis study was to examine if HRRP penalties in the fiscal year 2020 were correlated with a reduction of COPD readmissions at Indianapolis metropolitan hospitals in the fiscal year 2021. The dependent variable was the rate of COPD readmissions to Indianapolis metropolitan hospitals, and the independent variable was the application of the HRRP penalty.

Research Questions

This study was guided by the following research questions:

Research Question 1 (RQ1): Is there a difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

$H_0$1: There is no difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

H_a1: There is a difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

Research Question 2 (RQ2): Is there a difference in COPD readmission rates in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

$H_0$2: There is no difference in COPD readmission in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

H_a2: There is a difference in COPD readmission rates in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

Research Question 3 (RQ3): Is there a difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

$H_0$3: There is no difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

H_a3: There is a difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

Theoretical Framework

The theoretical framework grounding this study is the expectancy theory developed by Vroom (1965). The expectancy theory posits that people or organizations take action to maximize their expected satisfaction with outcomes (Vroom, 1965, 2005). Vroom (1965) claimed that individuals would behave in a particular manner as their expectations were motivated by a reward or outcome for such behavior. The premise is that the expected result may cause an individual to behave in a specific manner, thereby motivating the choice one can make regarding behavior. The processes an individual takes to make a particular behavioral or actionable choice incorporate the reasons behind such actions, meaning the motivating facets to promote the behavior (Vroom, 1965). Vroom's (1965) expectancy theory comprises three variables: valence (V), expectancy (E), and instrumentality (I; see Figure 1). Valence includes an individual's values, morals, and belief system (Osafo et al., 2021). Expectancy and instrumentality are established based on cognition (Osafo et al., 2021).

The three variables forming expectancy theory are significant for an individual's choice. The variables are clearly defined as "effort-performance expectancy (E>P expectancy), performance-outcome expectancy (P>O expectancy),” and the following:

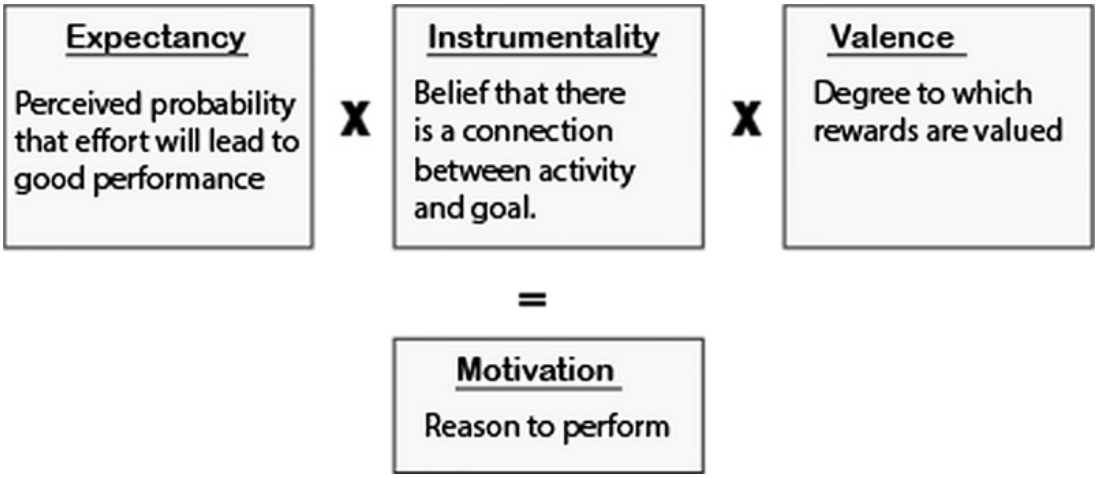
"Expectancy: effort → performance (E→P)

Instrumentality: performance → outcome (P→O)

Valence: V(R) outcome → reward" (Isaac et al., 2001, p. 20).

Figure 1

Vroom's Expectancy Theory



Note. Adapted from *Work and Motivation*, by V. H. Vroom, 1965, Wiley. Copyright 1965 by Wiley. In public domain.

All three of these variables interact together, prompting cognitive thought before acting out behavior and expecting a reward in the end.

Expectancy

Expectancy is the effort that equals performance. An individual's behavior results from conscious choices based on a perceived reward (Mehboob & Othman, 2020; Stouten et al., 2018). The reward or valence occurs through expectancy, prompting an effort to act a specific way equaling the individual's performance or instrumentality (Vroom, 1965). Self-efficacy, goal difficulty, and perceived control focus on expectancy, with individuals recognizing their desired goals can only be attained through desired

performances or actions. For example, receiving past rewards from specific behaviors prompts self-efficacy, as an individual has previously received such a goal for a recognized behavior. Understanding that a certain behavior produced the expected goal and the individual received the valence (reward), they remember and repeat the behavior in hopes for the same result (Fielding et al., 2017).

Experts have claimed that children learn reward and punishment constructs in this manner (Bosmans et al., 2019; M. H. Kim et al., 2017). Expectancy is an individual's understanding that the effort will prompt intended performance goals, resulting in a reward or valence (Bartz, 2020). Expectancy illustrates the idea that the individual's motivation for behavior will succeed in meeting an expected goal (Min et al., 2020). This idea is centered on an individual's self-confidence, perceived difficulty, and past experiences of a performance standard or goal. The associated facets established through an individual's expectancy perception are competence, goal difficulty, and control (Bartz, 2020; Min et al., 2020).

Instrumentality

The second variable of the expectancy theory is instrumentality. This variable posits that an individual is rewarded based on their expected behaviors (Porter & Lawler, 1968). Vroom (2005) claimed that instrumentality was based on an individual's belief that they would receive the expected reward if they perform as expected. Porter and Lawler (1968) suggested that instrumentality was affected if the individual who wanted this reward had the same experience in the past, where they had acted in a particular expected manner to receive a reward. Instrumentality is the belief that individuals' actions affect a rewarding outcome (Osafo et al., 2021).

For example, if hospital staff work to reduce their readmission rates, they may expect to receive a financial reward; conversely, they expect a financial penalty if they do not reduce this rate. Instrumentality in the expectancy theory is low if all performances are rewarded the same (Osafo et al., 2021). The factors that make up instrumentality include trust, control, and understanding. Trust is evaluated based on how well individuals believe in those who decide on the outcome or reward given based on performance. Control is associated with how those in charge make such reward decisions, with understanding focused on the correlation between behavior and reward or outcome (Osafo et al., 2021).

Valence

Vroom (1965) defined valence as an individual's belief that the outcome equals a reward. Therefore, valence forms the source of motivation regarded as the reward. The reward may come as financial, personal acquisition, self-accomplishment, or recognition; if the individual believes there will be such a reward, the level of expectancy can be high or low. Valence is often subjective, demonstrated by the extent to which an individual values the respective reward. It is not considered a level of satisfaction but an expectation of the pleasure a reward may give that individual (Osafo et al., 2021). Valence is a behavioral alternative, where the decision is measured on the value of the reward. The valence is only positive when the individual wishes to achieve the reward instead of not achieving it. When choosing between behavior options, an individual may select a goal that necessitates the most significant amount of motivational force (MF; Motivational Force = Expectancy x Instrumentality x Valence; Porter & Lawler, 1968).

The expectancy theory relates to how willing an individual is to perform a certain way to receive an expected reward. Vroom (1965) developed this theory to show that a person would be motivated to exert a high level of effort when they believed that effort would lead to a good performance appraisal (Mehboob & Othman, 2020; Porter & Lawler, 1968). A good assessment will lead to organizational rewards, satisfying their personal goals. With a high level of expectancy, a reward becomes attractive, motivation becomes generally high, and behavior is motivated by the anticipated results. Vroom (1965) suggested that an individual would behave in a certain way based on the expected outcome of a chosen behavior (Song et al., 2020).

Connecting Theory to Research

There are logical connections between Vroom's (1965) expectancy theory and the themes of the current study. The applicability of this theory includes the expectation that HRRP penalties in a fiscal year are correlated with reducing COPD readmissions. The expectancy theory posits that people or organizations take action to maximize their expected satisfaction with outcomes (Song et al., 2020). The expectancy theory's foundation is that people are motivated by (a) what they think the payment for a particular behavior is, and (b) how much they value the payment they are expecting to receive (Snead, 1991).

As applied to the HRRP and hospital rates of COPD readmission, the payment is a disincentive. Hospitals that do not exceed acceptable rates of COPD readmission will receive their total Medicare reimbursements. However, hospitals that exceed satisfactory COPD readmission rates may receive reduced Medicaid reimbursements (Rinne et al., 2018). When seen through the lens of expectancy theory, hospitals that value their total

Medicaid reimbursement rates will ensure they do not exceed acceptable COPD readmission rates. Based on the expectancy theory, the belief is that hospitals will act to ensure total Medicaid payouts because people or organizations have acted to maximize their expected satisfaction with outcomes (Rowley & Harry, 2011; Snead, 1991). People or organizations can take action to maximize their expected satisfaction with outcomes (Montiz, 2010; Rinne et al., 2018; Snead, 1991).

Literature Search Strategy

I searched for existing research in several databases using specific keywords and phrases. The databases included CINHAL, CHBD, Cochrane Library, Google Scholar, JSTOR, PubMed, PubMed Central, Research Gate, and Science Direct. The keywords and phrases used for this literature search included *COPD readmissions, COPD Hospital Readmission Reduction Penalties, hospital readmission, HRRP penalties influenced COPD readmissions among Medicare, Medicaid, privately insured patients, HRRP penalties*, *Medicare reimbursement with hospital readmissions*, and *readmissions reduction programs*.

I used inclusion criteria to determine those sources appropriate for the current review of literature that included resources (a) published in a peer-reviewed journal, (b) focused on themes central to this research, (c) with 85% or more of the selected literature had a publication date after 2017, and (d) written or translated in English. The first search extracted 9,682 resources evaluated first by article/resource title, with those not meeting the inclusion criteria disregarded. Then, I read the abstracts and removed several that did not meet the requirements. Finally, the entire articles were read, and those that met the inclusion criteria were selected, with 143 resources reviewed in this section.

Literature Review Related to Key Variables and Concepts

The purpose of the current quantitative retrospective comparative study was to examine if HRRP penalties in the fiscal year 2020 were correlated with reducing COPD readmissions at an Indianapolis metropolitan hospital in the fiscal year 2021. The rate of COPD readmission was the dependent variable, and the independent variable was the HRRP penalty. This purpose was derived from the problem of hospital readmission for COPD remaining high. Even though most COPD readmissions were preventable, it was currently not understood if HRRP penalties were correlated with reducing COPD readmissions (Press et al., 2020; Puebla-Neira et al., 2021).

Whereas there was research on the success or failure of the HRRP, there was limited research on whether applying the HRRP penalty for excess readmissions of COPD patients in the fiscal year 2020 reduced rates of COPD readmission at those same facilities in the fiscal year 2021 (Buhr et al., 2020a; Puebla-Neira et al., 2021). In addition, although past studies had shown the effectiveness of policy changes hospitals made in anticipation of CMS implementing HRRP penalties, little research had shown if receiving a penalty correlated with a change in the readmission rate in the following year. Although no data would determine whether programs had been created to improve COPD practice, the data would indicate if HRRP penalties were correlated with changes in readmission rates for this population.

Historical Context of Hospital Readmissions Reduction Program

The Affordable Care Act (ACA) recognized a need to increase quality measures in U.S. hospitals. The CMS (2021b) implemented quality measures in healthcare to ensure excellence in patient care. Standards for excellence were part of a quality

measures tool used that assisted those in the healthcare industry in measuring healthcare practices, systems, and outcomes related to delivering high-quality health care. Hospitals established efficient, effective, and patient-centered care (CMS, 2021b). The efficiency with patient care included reducing the potential for patients being readmitted, resulting in increased costs for most hospitals, particularly those readmissions within 30-days after discharge. Together with the CMS (2021b), the ACA established a program to help hospitals reduce readmissions called the HRRP. CMS (2021a) rolled out this program and defined it as the following:

> A Medicare value-based purchasing program that encourages hospitals to improve communication and care coordination to better engage patients and caregivers in discharge plans and, in turn, reduce avoidable readmissions. The program supports the national goal of improving health care for Americans by linking payment to the quality of hospital care. (para. 1)

This program was established to reduce hospital readmissions, with CMS penalizing hospitals that showed excessive readmission rates (Joshi et al., 2019; McIlvenan et al., 2015; Sun et al., 2018). Readmissions were often problematic for Medicare and private insurance companies, which would lose money with each readmission. The HRRP was developed to reduce the high Medicare and Medicaid readmissions, as 20% of Medicare discharges were readmitted within 30 days (McIlvenan et al., 2015). Because of the early positive responses from hospital administrations, the program was expanded in 2013 to include targeted surgical diagnoses focusing on reducing readmissions from certain DRGs associated with these surgical diagnoses (Chhabra et al., 2019).

Hospital staff use the number of readmissions divided by the number of discharges to determine the expected readmission rate. Each readmission is counted only once to avoid skewing the rate with multiple counts. The 30-day risk-standardized readmission measures are used to assess certain factors that affect a patient's well-being. The CMS (2021a) include six specific readmission measures when determining readmission penalty. These include acute myocardial infarction, heart failure, coronary artery bypass graft surgery, pneumonia, total arthroplasty for the knee or hip, and COPD. The payment reductions are determined by CMS using four steps: (a) for each of the six measures, CMS calculates an excess readmission ratio (ERR), where ERR = Predicted divided by Expected; (b) CMS stratifies hospitals into peer groups based on the dual proportion then calculates the median ERRs for each peer group; (c) CMS compares the performance of a hospital with the peer group median ERR for each measure; and (d) CMS calculates the hospital-specific payment reduction (Khouri et al., 2017; Zuckerman et al., 2017).

The calculated payment adjustment factor determines the penalty (Khouri et al., 2017). The payment adjustment factor relates to a hospital's payment percent, a weighted average of a hospital's performance across the six HRRP measures during the HRRP performance period. The payment adjustment factor is adjusted for all discharges in the same fiscal year, no matter the condition (Pedersen et al., 2017). Thus, if the rate does not go down from the previous year, the hospital is fined up to 2% of their Medicare dollars (Pedersen et al., 2017; Zuckerman et al., 2017).

Previously, hospital strategies to reduce readmissions were based on key measures from in-house implemented programs (Bradley et al., 2013). Hospital care

quality is one of these critical measures that administrators assess when looking at financial statements and reviewing cost-cutting measures. Readmissions are one of the most expensive costs for a hospital, often costing more than 14,000 dollars per readmission (Lahijanian & Alvarado, 2021; Warchol et al., 2019). Even before implementing the HRRP program, hospital management had recognized the need to decrease their readmission rates and had established specific methods. These strategies included early identification of high-risk patients with healthcare providers minimizing such patients' chances of readmission through post-discharge care instructions, providing referrals to a specialist for further care, and ensuring such resources as home health agencies were available (Kash et al., 2018; Zakaria et al., 2020).

Another strategy incorporated into many hospitals entailed ensuring adequate nursing coverage (S. J. Kim et al., 2016). Many administrators have relayed that reducing readmission rates should start with quality care during the first admission for any patient. In addition, many have agreed that appropriate nurse staffing levels are necessary to ensure proper and appropriate care was provided (S. J. Kim et al., 2016). Furthermore, studies have shown an association between the number of nursing staff at a hospital and its 30-day readmission rates (S. J. Kim et al., 2016).

Many hospital staff have previously implemented a program for reducing readmissions through improved transitional care (Kash et al., 2018). Experts have found that quality transitional care significantly decreased readmissions. Studies have shown that with such transitional care as rehabilitative services, skilled care, fall prevention measures, physical therapy, and restorative care, patients with complex or chronic conditions may increase their quality of life. However, many of these patients with

chronic conditions have continued to be readmitted to the hospital over time (Kash et al., 2018; Zakaria et al., 2020).

These earlier strategies might have helped decrease readmissions; however, CMS (2021a) considered hospital efforts not to reduce these rates enough and developed the HRRP. This program reduced Medicare payments to hospitals with an excessive 30-day readmission rate, representing 3% of the total Medicare payments the facilities would otherwise receive (Silvers & Rogers, 2018). Consequently, hospital staff had to develop different strategies further to reduce hospital readmissions. Experts explored such a new strategy put into place after HRRP was implemented. Hospital staff added case management and social workers while offering enhanced medication reconciliation (Silvers & Rogers, 2018). Even with these new strategies to reduce readmission, many hospital staff faced revenue reduction because of excessive readmission, with rates above the 3% target. Silvers and Rogers (2018) reported that between 2012 and 2015, 79% of hospitals in the United States faced financial penalties for 30-day readmissions.

This problem had prompted healthcare institution leaders to find ways to reduce the frequency of 30-day readmission for patients with such conditions as heart failure and COPD. Such initiatives revealed that a significant number of readmissions resulted from poor symptom management in patients with chronic conditions (Alshabanat et al., 2017). Researchers indicated that patients with chronic diseases, such as COPD, were frequently discharged prematurely, creating further medical issues with comorbidities (Saunders et al., 2019). Experts also argued that these patients receiving care in numerous settings, from acute care hospitals to nursing homes or private homes, did not help with recovery (Saunders et al., 2019).

Researchers conducted quantitative and qualitative studies focused on reviewing the efficacy of HRRP programs, with a significant percentage of experts finding that hospitals had limited success in reducing readmission rates (Dharmarajan et al., 2013; McIlvenan et al., 2015). When the HRRP was implemented in hospitals, an increase in 30-day, 90-day, and 1-year risk-adjusted heart failure mortality in the United States occurred (Albritton et al., 2018; Bradley et al., 2013). As heart failure was one of the leading causes for hospital readmission, this condition tended to have distressing symptoms that continued to progress after discharge.

It was not uncommon for a patient admitted with heart failure to be readmitted before 30-days after discharge expires (Albritton et al., 2018; Ziaeian & Fonarow, 2018). Experts noted the trends in 30-day readmission rates for heart failure patients were higher after implementing HRRP due to such reasons as most heart failure patients had comorbidities that would exacerbate heart conditions and increase the likelihood for heart failure (Hughes & Witham, 2018; Khan et al., 2021). Such a mortality increase was in opposition to a decade-long trend of declining heart failure mortality. Experts found that this program had failed effectiveness and unintended consequences to decrease readmissions.

The HRRP program's provisions prompted hospital participation based on payments received from CMS. The failure to include postdischarge care or other interventions created more of a problem and offered no financial incentive to reduce the incidence of readmission (Ody et al., 2019; Pedersen et al., 2017). Even though CMS promoted the HRRP as an incentive program, after implementation, many experts considered it a negative penalty program rather than the positive incentive program it was

advertised (Buhr et al., 2020a; Puebla-Neira et al., 2021). Readmission is considered a second or subsequent admission, and most hospital staff track such rates, particularly those within a 30-day timeframe (Ody et al., 2019).

Scholars noted that, under HRRP, readmission risks were considered a means for inferring a hospital's quality (Bradley et al., 2013; Khera & Krumholz, 2018). Although specific short-term health declines had resulted in necessary readmission, evidence showed that 30-day readmission risk was reduced by providing higher quality care (Gai & Pachamanova, 2019; Upadhyay et al., 2019). In addition, researchers found that with a higher standard for quality in care, many medical conditions would have better after-discharge outcomes, reducing the need for further hospitalization (Pugh et al., 2021; Zakaria et al., 2020).

Further investigations showed experts finding success in the HRRP for certain conditions (Agana et al., 2020; Hong & Halm, 2021). Most common were those conditions considered to have potentially preventable readmissions. The potential for readmission has much to do with the patient's age, the condition, and the quality of care found within the hospital environment (Glans et al., 2020; Wadhera et al., 2019). Experts examined potentially preventable readmission PPRs finding that readmission rates would rise with increasing severity of illness and lengthened the time between admission and readmission, varying based on the type of prior admission and the patient's mental state regarding recovery (Glans et al., 2020).

Chronic Obstructive Pulmonary Disease

COPD refers to a progressive lung disease characterized by limited airflow and long-term respiratory symptoms (American Lung Association, 2021a; Centers for

Disease Control and Prevention, 2020). Shortness of breath, coughing, and progressively worsening as everyday activities, such as dressing or walking a short distance, are difficult (de Oca et al., 2021). Chronic progressive shortness of breath is a primary symptom of COPD accompanied by wheezing, tightening of the chest following any exertion, lack of energy, unintended weight loss, frequent respiratory infections, and a chronic cough. Although COPD does increasingly worsen, it is treatable (American Lung Association, 2021a).

Statistically, COPD was the third leading cause of death globally, with the associated treatment cost close to ten thousand dollars for a single patient hospitalization. Each COPD patient had a rehospitalization risk of 44% after their first admission and within the first 5 years after the initial discharge. These patients had a 55% prevailing mortality rate (American Lung Association, 2021a).

The Centers for Disease Control and Prevention (2020) stated, “Smoking accounts for as many as 8 out of 10 COPD-related deaths" (para. 9). In addition, the American Lung Association (2021a) claimed that cigarette smoking was the cause of COPD in 85% to 90% of all cases. However, other factors, such as exposure to air pollutants, respiratory factors, having the genetic condition, Alpha-1 deficiency, working around chemical dust and fumes, suffering from breathing disorders such as asthma throughout childhood, and breathing secondhand smoke, can cause COPD (American Lung Association, 2021b).

Complications associated with COPD include activity limitations, staying connected to an oxygen tank; experiencing increased memory loss or confusion, depression, and anxiety; being highly susceptible to frequent hospitalizations; and having

associated comorbidities (McCarthy & Pandey, 2018; Miravitlles & Ribera, 2017). Two conditions known to contribute to COPD include chronic bronchitis and emphysema (Kiani & Ahmadi, 2021). However, COPD has associations with multiple comorbidities based on the systematic inflammation being induced by such actions as smoking tobacco. As a contributing factor to COPD, experts claimed that such comorbidities with COPD could include chronic heart disease, stroke, cancer, diabetes, and lung diseases (Kiani & Ahmadi, 2021). Experts also stated that COPD was no longer considered a disease only of the lungs because healthcare providers had found it associated with a wide variety of systemic consequences, such as chronic respiratory infections (National Institutes of Health, 2021). Such consequences have shown that hospital administrators should consider the HRRP to decrease readmission rates with such chronic conditions as COPD.

The concern with increased readmission rates leading to CMS implementing the HRRP suggests that hospital staff should control readmissions of newly discharged patients, examine the causes, and adjust measures to decrease those unnecessary readmissions (Franssen et al., 2018; Portillo et al., 2018). However, most hospital administrators have claimed that readmissions could not be predicted, even though experts studying this phenomenon have shown methods that impact increased readmission rates, particularly with those rates associated with COPD (Portillo et al., 2018). Experts have found reasons for COPD-associated readmissions include the length of stay, poor follow-up healthcare after discharge, and being discharged without home care (Alqahtani et al., 2020). Also noted, experts have found that depression and alcohol use are associated with an increased readmission rate of COPD patients (Kerahrodi et al., 2019; Ronaldson et al., 2021).

Readmission Rates for Multiple Diseases, Ailments, and Health Conditions

Hospital administrators do not typically understand patterns of readmissions for multiple chronic diseases (Mihailoff et al., 2017; Sukul et al., 2017). However, experts have found that the most common among readmitted patients are those with multiple chronic conditions and comorbidities, increasing total hospital financial losses by over eight hundred dollars per readmission (Aubert et al., 2019; Guisado-Clavero et al., 2018; Mihailoff et al., 2017). The financial margin per admission can vary based on diagnosis and length of stay. However, due to high admission rates, the most common chronic conditions related to hospitals' financial loss include heart failure, pneumonia, chronic renal disease, and COPD (Fudim et al., 2018; Sukul et al., 2017).

Previous research indicates that hospital financial health may increase by investing in strategies to reduce chronic illness hospitalizations in patients and high-risk groups for readmission potential (Fudim et al., 2018; Mihailoff et al., 2017). Nevertheless, other professionals claimed that such findings were in opposition to the common claim that hospitals should fill beds to make money instead of reducing rehospitalizations (Gjeka et al., 2021; Richardson et al., 2020). Experts investigated reasons for the same hospital readmissions, claiming factors of chronic conditions caused the most prominent reasons for high readmittance rates (Brunner-La Rocca et al., 2020; Gjeka et al., 2021). Researchers found heart failure was a leading cause of readmission for patients over 65 years (Fudim et al., 2018; Gupta & Fonarow, 2018).

Focusing on a holistic pattern of care based on a patient having comorbidities was examined as most patients were noted having multiple conditions associated or alongside their primary and chronic disease. Scholars commented that due to standard interactions

between disease and treatment, the hospital staff must recognize and understand the patterns of readmissions related to these different chronic diseases (Brunner-La Rocca et al., 2020; Fudim et al., 2018). Others claimed that using new treatment modalities based on holistic care for patients with multiple conditions was needed but had yet been examined (Brunner-La Rocca et al., 2020). Experts concluded that reducing readmissions should focus on the primary condition and understanding all the patient's comorbidities (Brunner-La Rocca et al., 2020; Fudim et al., 2018; Richardson et al., 2020).

Readmission Rates for Chronic Obstructive Pulmonary Disease

Although readmissions rates are high for many chronic conditions, COPD has one of the highest number of patients readmitted within 30-days of a U.S. hospital discharge (Euceda et al., 2018; Portillo et al., 2018). In addition, experts examined the risk factors associated with an all-cause readmission rate following COPD exacerbation, showing that patients experiencing frequent infection and aggravation of the lungs showed a susceptibility for increased length of stays in their first hospital admission (Echevarria et al., 2017; Hurst et al., 2018). As previously stated, such readmission reasons for COPD include the length of stay, poor follow-up healthcare after discharge, being discharged without home care, increased depression, and increased alcohol use (Alqahtani et al., 2020; Kerahrodi et al., 2019; Ronaldson et al., 2021).

Readmission Reasons for Chronic Obstructive Pulmonary Disease

COPD hospitalizations impair quality of life, high health care utilization, and poor prognosis and result in an economic and a social burden that is both substantial and increasing (Alshabanat et al., 2017; Kong & Wilkinson, 2020). Harries et al. (2017) aimed to determine readmission risk for COPD, factors influencing that risk, and

variation in readmission risk between hospitals. Recent financial penalties for high-risk-adjusted COPD readmissions are causing hospitals to search for ways to reduce COPD readmissions. Although some have advocated for increasing length of stay to decrease readmissions, the association between length of stay and readmission is unclear (Agana et al., 2020; Taylor & Davidson, 2021). Therefore, experts examined the primary objective associated with length of stay and readmission among patients admitted for COPD (Alshabanat et al., 2017; Andreas et al., 2019; Echevarria et al., 2017; Rinne et al., 2017a). On a patient level, the longer length of stay for COPD hospitalizations was associated with a higher risk for readmission, which is likely confounded by the severity of the illness (Alshabanat et al., 2017; Rinne et al., 2017a). However, experts suggested that length of stay was not associated with readmission (Andreas et al., 2019; Echevarria et al., 2017). These findings imply that independent of other transitional care practices, altering hospital length of stay may not influence the risk of readmission.

Length of Stay

Increased length of stay associated with COPD readmissions was typical and was considered a significant issue with financial penalties for many hospitals. However, scholars examining these correlations found that patients with longer lengths of stay and hospitalizations were likely at a higher risk for readmission because of their confounded severity of the disease (Loh et al., 2017; Rinne et al., 2017b). However, other experts showed that length of stay was not associated with such risks of readmission at the hospital level. These findings implied that independent of other transitional care practices, altering hospital length of stay may not influence the risk of readmission for

COPD patients unless there were confounding factors or comorbidities (Iacobucci, 2017; Vogelmeier et al., 2017).

Experts measuring for an association of length of stay with readmission rates for multiple chronic diseases were divided with opinions varied when discerning if the length of stay predicted COPD readmissions when associated with confounding comorbidities (Kong & Wilkinson, 2020; Rachoin et al., 2020; Samsky et al., 2019). Studies showed that a shorter stay after hospitalization and discharge to home increased readmission rates, particularly for patients admitted for the first time with either heart failure or COPD (Rachoin et al., 2020; Samsky et al., 2019). Furthermore, these same scholars claimed that length of stay did not correlate with readmission rates (Rachoin et al., 2020; Samsky et al., 2019). Rachoin et al. (2020) claimed that having a longer length of stay had shown to be predictive of readmissions for general medical patients, while Samsky et al. (2019) suggested that the HRRP had limited benefits for lowering readmission rates when measured against a longer length of stays. A shortened length of stay was the likely cause for increased readmission rates in heart-related diseases, while rates for non-cardiovascular were seen to decrease (Samsky et al., 2019).

Behavioral and Social Risks

However, other scholars claimed that COPD readmissions were independent of other transitional care practices; therefore, altering the hospital LOS did not influence or increase readmission (Goto et al., 2017; Press et al., 2019). In addition, scholars noted that behavioral and social risk factors were linked to increased COPD readmission risk (Alqahtani et al., 2020; Press et al., 2019). Such factors included smokers as compared to those who never smoked, unmarried patients, patients who were found underweight and

patients who were classified as obese, alcohol or substance abuse, and patients with low socioeconomic status (Alqahtani et al., 2020; Gershon et al., 2019; Goto et al., 2017). In addition, findings from Cousse et al. (2019) and Michas et al. (2020) showed that discharge destinations, such as a home with no assistance or long-term care, were associated with 30-day readmission for COPD patients, particularly in patients who experienced reoccurring exacerbations.

Cardarelli et al. (2018) validated that individuals living alone and unable to perform daily activities were at higher risk for readmission. Furthermore, Cardarelli et al. claimed that individuals with COPD were prone to hospital readmission within 30-days after discharge if they frequently visited their healthcare provider, had comorbidities, were prescribed more than five daily medications, and had multiple emergency department visits over the previous year. Additional research identified elderly age, people of color, and unemployment as predictors for increased hospitalization, often needing numerous hospitalizations (Coffey et al., 2019). Patients having graduated high school, married, employed, and having someone who helps with care were found as predictors of improved health outcomes in chronically ill patients such as those with COPD (Coffey et al., 2019).

Perceived barriers have been associated with at-home care for COPD patients from non-professional caregivers, including financial burden, high burnout rate, and poor symptom management skills (Kar & Zengin, 2019; Miravitlles et al., 2015). Experts found that caregiver burden was significantly associated with managing symptoms associated with readmission rates (Kar & Zengin, 2019; Karabekiroglu et al., 2018). However, the critical component of at-home caregiving for patients with no family

support was the considerable financial cost, the time needed to spend caring for the patient, and the necessary knowledge related to the illness or condition required for such care (Kar & Zengin, 2019; Karabekiroglu et al., 2018; Miravitlles et al., 2015). Strategies using discharge planning more productively suggested a means for decreasing readmission rates. Discharge planners who work with patients and families to ensure discharge success and the patient does not need readmission should be provided with tools that assist the patient care at home and defend against the patient having to return to the hospital (Karabekiroglu et al., 2018).

Strang et al. (2019) examined the barriers affecting symptom management among the family caregivers of cancer patients. The authors observed a relationship between symptom management barriers and the demographic variables that affected their patients' family caregivers associated with disease-related variables. For example, most COPD patients spent days with caregivers who were not receiving care from family members and away from formal caregiver services. Therefore, the various barriers that emerged affected the ability of family caregivers to manage patients' symptoms adequately. Hipolito et al. (2020) supported this notion, suggesting that cancer contributes to a wide array of physical, emotional, and psychological problems for cancer patients and their family caregivers.

Studies also showed that many at-home caregivers who were not professionals experienced financial instabilities (Matarese et al., 2021; Scheerens et al., 2018). However, the most significant difficulty was encountered when determining family caregivers' knowledge of COPD. Almost 98% of at-home participants and family member caregivers indicated that they did not possess any prior experience caring for a

patient with any chronic condition. Caregivers had close family ties with patients (e.g., they were the patient's spouse, sibling, or child). In addition, nearly all reported discontinuation of employment routines following the patient's hospitalization, leading to financial burdens (Hipolito et al., 2020; Matarese et al., 2021; Scheerens et al., 2018). Researchers argued the definitive need for educating both family caregivers and their patients concerning pain management at-home care of COPD patients to improve overall health outcomes and reduce the risk of readmission to the hospital (Hipolito et al., 2020; Matarese et al., 2021).

Studies also revealed that over 85% of family caregivers did not have adequate training or experience caring for COPD patients, especially in respiratory distress (Scheerens et al., 2018; Sigurgeirsdottir et al., 2020). Additionally, many family caregivers (86.8%) encountered challenges when deciding how and when to deliver care. These challenges included the education of family caregivers. The opportunities for practical implementation indicated a need to increase knowledge through the teaching of family caregivers regarding the management of cancer symptoms for patients within in-home care settings. Family caregivers also had psychological strains that had to be addressed. Sigurgeirsdottir et al. (2020) argued that improving caregiver education reduced the stress of both family caregivers and patients. Thus, education and instruction for COPD patients and their caregivers were crucial for managing symptoms.

Patients with chronic conditions were more prone to stressful situations affecting their health outcomes. Increased levels of anxiety and depression displayed by newly discharged patients indicated a need for mental health care before discharge (Hipolito et al., 2020; Matarese et al., 2021). Thus, identifying the factors affecting patients'

psychological and physical health helped reduce distress and stress (Hipolito et al., 2020). The prevalence of chronic conditions aggravated by depression and anxiety was high in many COPD patients, which may have prompted further health condition deterioration. Therefore, efficient intervention practices focused on their physical, mental, and psychosocial health needs were suggested as necessary to mitigate the risk (Matarese et al., 2021). Readmission into home care after discharge was found to help manage mental health symptoms by improving patients' overall well-being and reducing the number of hospital readmissions (Hipolito et al., 2020; Matarese et al., 2021).

Patients discharged with a chronic condition or disease must recognize the various barriers that limit their ability to manage their symptoms. Caregivers of such patients must be provided with the necessary information to care for their loved ones at home adequately. However, the challenges of a lack of knowledge, economic burdens, psychosocial issues, psychological issues, and increased stress levels often create further healthcare issues that lead to readmissions. All of which adversely affected care practices for such patients (Scheerens et al., 2018; Sigurgeirsdottir et al., 2020).

Infection and Comorbidities

Experts found certain bacterial *Pseudomonas aeruginosa* infections, which cause pneumonia and blood infections to exacerbate COPD readmissions (Choi et al., 2018; Shiroshita et al., 2021). In addition, it was noted as an antibiotic-resistant bacterium creating problems with newly discharged COPD patients who return for readmission within a 30-day window. These researchers claimed that when COPD patients were exposed to this specific bacterium during their hospital stay, once they were discharged home, they were significantly more likely to be readmitted within 30-days with lung

infections (Choi et al., 2018; Shiroshita et al., 2021). Additionally, the findings suggested that COPD patients who had been on a ventilator, a catheter, or had bedsores were significantly more likely to have conditions after discharge and needed readmittance within 30-days (Choi et al., 2018; Shiroshita et al., 2021).

Studies found that such issues creating an increase in hospital readmission rates for COPD patients were likely due to such infections (Couillard et al., 2017; Epstein et al., 2018). However, Epstein et al. (2018) disagreed, claiming an increased red blood cell distribution was more likely a predictor of adverse outcomes based on acute exacerbation in COPD patients. Other experts found similar results as Couillard et al. (2017), showing such factors as eosinophils in COPD exacerbations, early hospital readmission because of acute exacerbations, and blood-borne infections (Guerra et al., 2017; Jacobs et al., 2018).

Communication

Patients who had been discharged agreed that communication was necessary for increased health outcomes (Archer et al., 2017). Motivations for efficient communication surfaced between patients, family caregivers, and healthcare professionals, which reduced emotional and psychological barriers primarily associated with health and care issues of those patients with chronic conditions. Patients placed value on discussing their health, and the more communication between patient, caregiver, and provider, the less likely readmissions would occur. Therefore, patients require care professionals to discuss potential care plans and possible outcomes. Research on readmissions of patients with heart failure, COPD, and cancer found that patients who received inpatient consultations from a multidisciplinary, coordinated care team had lower 30-day hospital readmission

rates (Archer et al., 2017). These referrals to palliative care required communication with families and other healthcare providers (Archer et al., 2017).

Exacerbations and Clinical Assistance

For patients surviving hospitalization with COPD exacerbation, readmission to the hospital was significantly high. An exacerbation is defined as the worsening of COPD symptoms and consequently, in most cases, causes a need for hospitalization (Couillard et al., 2017). Identifying and mitigating exacerbations as a risk factor for readmission is therefore essential. Cost-effective interventions can include inhalers and pulmonary rehabilitation, and studies have shown these have reduced exacerbations and related hospitalizations (Ferdinand et al., 2019). However, issues with inadequate inhaler technique or poor adherence were often ineffective in preventing readmissions (Guerra et al., 2017).

Clinical management of COPD is complex. Because the clinical progression is a gradual impairment with episodes of acute exacerbation, COPD patients have increased readmissions, exponentially increasing demands on acute hospital services (Harries et al., 2017; LaBedz & Krishnan, 2020). In addition, experts explained that COPD patients were predisposed to getting fragmented care. Many patients were shuttled from one health care setting to another as they received multiple types of care from numerous providers, particularly with those COPD patients who have comorbidities.

Multiple treatments often cause adverse effects and poor outcomes (Harries et al., 2017). For example, Harries et al. (2017) found that 32.2% of patients had at least one COPD readmission within one year, 10.2% were readmitted within 30 days, and 17.8% were readmitted within 90 days. However, reducing fragmented care proved difficult for

COPD interventions. Many COPD patient caregivers failed to maintain and manage such rigorous schedules once the patient was discharged home, increasing hospital readmissions (LaBedz & Krishnan, 2020).

Programs and Strategies to Decrease Readmission Rates

Readmission rates have become a significant concern for CMS with healthcare reforms promoted and rising pressure to decrease unnecessary and preventable hospital readmissions while reducing costs (Ahmad et al., 2018). Experts considered numerous strategies to lower hospital readmission rates; some were found successful and others failing (Zakaria et al., 2020). Such methods included the early identification of patients at high risk for readmission.

For example, Pugh et al. (2021) and Warchol et al. (2019) showed such features and circumstances identifying patients at a higher risk of being readmitted, particularly within 30-days after previous discharge. Such preventative measures against readmissions suggested by the authors included recognition of certain medical conditions, patients having comorbidities alongside these conditions, mental health factors, history of readmissions, taking multiple medications, age, home support and if they have care, financial issues, and living conditions (Pugh et al., 2021; Warchol et al., 2019).

Scholars reviewed the effectiveness of structured planning for post-discharge support of COPD patients and reduced readmissions, with some stating positive changes while others claimed readmission rates were overstated (Ody et al., 2019; Pedersen et al., 2017). Experts considered the best practices and current innovations with a postimplementation of the CMS HRRP, showing findings that the application of specific preventative measures created as a response to including COPD in the HRRP reduced

rates of COPD readmission at specific hospitals (Jacobs et al., 2018; Press et al., 2019). Studies further showed that readmission rates were based on various diseases and conditions with the availability of at-home care for discharged patients (Demiralp et al., 2018; Ferro et al., 2019).

Vernon et al. (2019) and Mwachiro et al. (2019) made suggestions for improving discharge planning. Vernon et al. (2019) examined the propensity of older patients (> 65 years) to be readmitted to the hospital within 30-days after a previous hospital stay. The patients in the sample were discharged under the hospital's discharge planner's care. Still, many patients reported never receiving any follow-up from either the discharge planner, a social worker, or even their primary healthcare provider. The authors then implemented a thirty-day program for intervention with two groups of nurses assigned to contact these patients within 48 hours after discharge to ensure follow-up appointments were made and follow-up care was provided (Vernon et al., 2019). At the end of the 30-days, the authors reviewed the records of readmission, finding that the simple intervention program successfully reduced readmissions.

Other professionals discussed care strategies for reducing readmissions with varied outcomes (Bricard & Or, 2019; Lahijanian & Alvarado, 2021; Mwachiro et al., 2019). Such strategies included using a transition of care model that established improving patient care before discharge. Bricard and Or (2019) explained how the transition of care models provide multidisciplinary cooperation, necessary education, and reliable communication to guarantee that having quality inpatient care establishes a limiting need for readmissions after discharge. In addition, with this strategic program, patients were provided with higher quality ambulatory care that directly and positively

affected their health condition. The increased attention paid to hospitalized patients based on care decreased the chance of readmission (Bricard & Or, 2019).

Factors That Impact Readmission Rates

The most common factors that impact readmission rates include health conditions, insurance type, demographics and psychographics, and low patient engagement (Ferro et al., 2019; Horwitz et al., 2017). Of course, the patients' health constitutes an enormous role in readmissions. However, studies showed that other resolute factors associated with the patient's health conditions also impacted the prevalence of readmissions (Brewster et al., 2019; Horwitz et al., 2017). For example, patients with chronic diseases and conditions, such as COPD and heart failure, have a higher readmission prevalence than patients with ailments, such as diabetes and arthritis (Brewster et al., 2019). Furthermore, Brewster et al. (2019) found that aiding with basic meals and shopping, transportation to appointments, and emotional support needs to be considered when reviewing the factors that impact readmission rates.

The environment a patient resides in has a significant impact on their health outcome and can facilitate the number of hospital readmissions (Reid et al., 2021; Spatz et al., 2020). Spatz et al. (2020) examined the influence of environmental factors identifying the most prevalent variables associated with hospital readmission rates to determine if the rate of readmission was affected by community factors. The researchers indicated that elements having the most significant impact on readmissions were whether the patient had family or friend support within the community they lived (Spatz et al., 2020). Findings showed that patients discharged from the hospital needed convalescing

care, but those who did not have at-home provisions for care from family or friends were more likely to return to the hospital within a 30-day window (Spatz et al., 2020).

Reid et al. (2021) expanded Spatz et al.'s (2020) findings and explained that hospital social workers should be the first to improve performance measures with discharge planning. The authors used hospital discharge data to assess the exposure to predicators for readmitting the patient after leaving the hospital (Reid et al., 2021). The readmission rates contextualized through a community lens were found to assist hospital social workers in improving discharge planning and reducing hospital financial penalties while providing a higher quality of patient care.

Experts observed if a multicomponent COPD post-discharge integrated disease management program improved the care of patients with COPD and reduced readmissions (Coffey et al., 2019; Russo et al., 2017). The researchers found that in a sample of 160 patients with COPD, the readmission risk was lessened when exposed to and experiencing all the components of a care coordination model versus those patients who were exposed to only a few of the components during treatment (Coffey et al., 2019; Russo et al., 2017). Researchers supported Russo et al.'s (2017) findings, showing that a post-discharge integrated disease management program component was associated with a reduced 90-day readmission rate (Goto et al., 2017; Rice et al., 2021). However, other experts found certain risk factors that created the need for increased quality in treatment methods to assist in reducing readmission rates in hospitals (Glans et al., 2020; Werner et al., 2019).

Overdiagnoses increased the effect on 30-day hospital readmission rates for COPD patients (Goto et al., 2017; Portillo et al., 2018; Rice et al., 2021). Factors include

the belief in an individual's decision on who receives what outcome, the simplicity of deciding who gets what treatment, and the relationship between performance and outcomes. Rice et al. (2021) identified COPD patients as over-diagnosed. They were discharged, suggesting that most over-diagnosed patients having COPD were readmitted to the same hospital within 90-days. The sample included over 400 hospital discharges which, upon first hospital admission, were over-diagnosed with a greater than predicted limit of normal on a spirometry test (Rice et al., 2021).

Previous healthcare utilization of integrated disease management treatment was likely to lower readmission rates, particularly with COPD patients after discharge (Gruneir et al., 2018). Researchers found that reducing preventable readmissions among Medicare beneficiaries was an effective way to reduce the rising cost of healthcare and improve the quality of patient care (Daras et al., 2017; Yakusheva & Hoffman, 2020). Such methods were predicated on hospital administration and management either developing strategies for decreasing readmissions or taking an already proven strategy or methods and supporting its implementation. Experts explained that previous efforts to reduce the readmission rate of patients have not been very successful because of ill-defined quality measures, improper data collection methods, and a lack of effective strategies based on data-driven solutions (Hoffman & Yakusheva, 2020; Horwitz et al., 2017; Mittal et al., 2018).

Preventing and Decreasing Readmissions

Experts proved that comorbidity indices provided data that assisted in predicting readmission odds in COPD patients. Thus, using these comorbidity indices allows for a decrease in readmissions (Alshabanat et al., 2017; Buhr et al., 2019). In addition, the

efficacy of a comprehensive care management program (CCMP) in reducing the length of stay and risk of hospital admissions and readmissions in patients with COPD was associated with a significant reduction in hospital admissions & LOS (Alshabanat et al., 2017; Lu et al., 2021).

Alshabanat et al. (2017) examined the efficacy of a CCMP in reducing the length of stay (LOS) and risk of hospital admissions and readmissions in patients with COPD. The authors found that the disease management program reduced COPD-related hospitalizations by 30% and hospitalizations for all causes by 13.6%. Similarly, the readmission rate showed a significant decline (Alshabanat et al., 2017). However, multiple studies showed that reducing preventable readmissions among Medicare beneficiaries was an effective way to minimize the rising cost of healthcare and improve the quality of patient care (Facchinetti et al., 2020; Mittal et al., 2018). Unfortunately, many previous efforts to reduce patient readmission rates have not been successful because of ill-defined quality measures, improper data collection methods, and a lack of effective strategies based on data-driven solutions (Facchinetti et al., 2020; McCarthy & Pandey, 2018).

Readmission Rates and Efficacy Using Comprehensive Care Management Programs

Common in U.S. hospitals is implementing a CCMP. The CCMP offers healthcare and mental health providers a joint effort to assist patients with chronic conditions requiring help from newly discharged to home (Ahmadi et al., 2021; Wan et al., 2021). The elements of a CCMP include establishing a dedicated care team, which will develop a comprehensive care plan that consists of a medication regimen and care-management tools (Ahmadi et al., 2021). A CCMP also provides a hospital-to-home

program with patient education materials and ensures the expanded communication between patients and healthcare professionals in the community for care coordination of home-based provisions of healthcare services. Experts examining the benefits of a CCMP found improved clinical outcomes after discharge, reduced duplicative tests and procedures, and reduced high-cost acute care services, including readmissions (Wan et al., 2021). Implementing a CCMP requires a joint effort between the community and hospital resources, providing value-based care to improve outcomes and lower the cost of healthcare, and offering care coordination. This care coordination includes developing strategies for patient engagement and self-management after discharge (Ahmadi et al., 2021; Wan et al., 2021).

Ahmadi et al. (2021), Wan et al. (2021), and McCants et al. (2019) examined the effects of a CCMP on readmission rates for COPD and heart failure patients who were discharged using comprehensive case management services. These discharge strategies were particularly influential for COPD patients as they were diagnosed before discharge with multiple clinical and psychosocial risk factors associated with readmissions. These factors included anxiety, concern about not having assistance with transportation, medication management, and fear of their home being unsafe (Ahmadi et al., 2021).

Experts also found different results with case managers using integrated case management services to prevent high-risk patient readmissions who were discharged after surgery for heart failure (McCants et al., 2019; Wan et al., 2021). The authors recommended that specific case management approaches to reduce 30-day readmissions effectively reduce costs and improve outcomes through a program similar to CCMP that involved a health care team, including the patient. Evaluating specific case management

approaches utilized a comprehensive means to find researched and proven skills that assisted in decreasing readmission rates for high-risk patients (McCants et al., 2019).

The CCMP was examined as a preventative measure for COPD readmissions. Experts explained that acute exacerbations were a leading cause of COPD readmissions and had become a high priority for hospital reduction of these readmission rates. When the HRRP was implemented, many hospitals were penalized with high dollar amounts deducted from their monthly Medicare payments (Alshabanat et al., 2017). To prevent such reductions, some experts claimed that using a CCMP provided a means to reduce these high costing readmissions (Alshabanat et al., 2017; Ferdinand et al., 2019). Examining hospital interventions to reduce 30-day readmissions for specific diseases and populations found that continuity of care interventions was successful with older populations with chronic diseases such as heart failure and COPD (Ferdinand et al., 2019).

However, CCMP does have issues. Experts examined the barriers to using CCMP to lower readmission rates (Nayak et al., 2018; Park et al., 2018). The explored information produced results that CCMP barriers encompassed problematic symptom management after discharge, which resulted in readmission within the first 30-days post-discharge (Nayak et al., 2018). Experts assessed such relationships between symptom management barriers and the demographic variables that affected their patients' family caregivers associated with disease-related variables. Most patients with chronic disease who receive care from family members and are away from formal caregiver services often lack symptom management. Therefore, various barriers emerged that affected the ability of family caregivers to manage patients' symptoms adequately. Park et al. (2018)

supported this notion, suggesting that long-term chronic illness could contribute to many physical, emotional, and psychological problems for patients and their caregivers. A significant issue was with pain control.

The barrier of pain control presented a challenge since the pain was considered a significant symptom experienced by many patients with chronic conditions (Geng et al., 2018). Furthermore, depression symptoms experienced by family caregivers were influenced by unemployment issues that resulted from prolonged caregiving, a close relationship with the patient, challenges of caregiving, and the disturbance of personal space. Challenges faced by caregivers often lead to depression. The barriers that family caregivers believed were hindering the management of symptoms would positively correlate with demographic and disease-related variables, including education, age, duration of treatment, cancer stage and type, income, and length of illness (Carella & Monachesi, 2018; Nayak et al., 2018). These barriers indicated failing health, often causing the patient's return to the hospital (Barkley et al., 2019).

Hospital Readmissions Reduction Program Penalties Correlated To Change in Readmission Rates

The effect of an HRRP was associated with observed stay rates for COPD, HF, and CVS patients (Albritton et al., 2018; Taylor & Davidson, 2021). Multiple experts believed that the effect of the HRRP was productive, decreasing the rate of readmissions in many high-risk patients (Albritton et al., 2018; Taylor & Davidson, 2021). However, other experts were distinctly confident that using HRRP in hospitals only modestly reduced readmission rates (Gupta & Fonarow, 2018; Taylor & Davidson, 2021). Additionally, these same researchers found that the HRRP increased short-term (30-day

and 90-day) and long-term (1-year) mortality following hospitalization (Gupta & Fonarow, 2018; Sandhu & Heidenreich, 2019). Experts relayed that the impact of HRRP financial penalties was associated with a minor reduction in readmission (Thompson et al., 2017).

Researchers determined that HRRP penalties were significantly correlated with COPD readmission (Chen & Grabowski, 2019; LaBedz & Krishnan, 2020). Experts examined if HRRP penalties influenced COPD readmissions learning that the implementation of HRRP in a hospital decreased COPD readmission rates. However, this rate was only compared to on-HRRP controls and not versus other HRRP conditions (Buhr et al., 2020b; Joynt Maddox et al., 2019).

Researchers examined the association of HRRP with 30-day hospital readmission and 30-day post-discharge mortality rate in patients after discharge from COPD hospitalization (Joynt Maddox et al., 2019). These studies showed that hospital rates of COPD readmission decreased after CMS announced that COPD would be included in an HRRP program (Puebla-Neira et al., 2021). However, researchers questioned if implementing initial financial penalties for conditions other than COPD was associated with decreased hospital readmissions (Myers et al., 2020). Studies showed that in patients with COPD and any insurance status, there was an association between the initial phase of the HRRP and a decrease in both all-cause and COPD-related readmissions even before COPD became a target diagnosis (Puebla-Neira et al., 2021).

Effectiveness Centers for Medicare and Medicaid Services Hospital Readmissions Reduction Program Penalties

Even a near-decade after implementing HRRP penalties throughout U.S. hospitals, preventing readmissions still shows cause for concern (Ibrahim & Dimick, 2019; Kash et al., 2018). Much of the problem stems from the failure to lower readmission rates for high-risk conditions, and surveyed data showed that only one-fourth of U.S. hospitals could reduce their readmission rates by implementing HRRP (Kash et al., 2018; Psotka et al., 2020). Moreover, after a decade from its inception, experts questioned the changes in HRRP's success in lowering readmission rates and if the penalties associated with the HRRP assisted with such modifications (Ibrahim & Dimick, 2019; Kash et al., 2018).

In the beginning, the HRRP demonstrated significant reductions in readmission rates for targeted medical conditions, such as acute myocardial infarction, heart failure, and pneumonia. Later there were expansions to add other conditions such as knee replacements, hip replacements, and COPD, which also showed decreased readmission rates on a smaller scale. However, there was a notable spillover effect to nontargeted conditions, including surgical procedures. Later reports raised concerns about the unintended consequences of HRRP, including increased rates of mortality and abrupt changes in condition severity recorded (Psotka et al., 2020; Samarghandi & Qayyum, 2019). There has been a growing desire from payers, health care professionals, policymakers, and patients to understand better the influence of the HRRP, including its most recent iteration, which added surgical procedures.

Experts claimed that hospitals having the highest risk-standardized readmission rates also experienced the most significant improvement after the passage of the Medicare HRRP is unknown (Clement et al., 2017; Wasfy et al., 2017). Some experts claimed that HRRP developed the right incentives for reducing readmissions (Wasfy et al., 2017; Yakusheva & Hoffman, 2020). However, these same researchers suggested that reducing the rate of readmissions was inconsistent across patient and hospital groups; therefore, benefits of adjusting the policy according to the socioeconomic status of a hospital's patients would prove advantageous (Wasfy et al., 2017; Yakusheva & Hoffman, 2020). Furthermore, scholars examining the success or failure of an HRRP observed three main facets: (a) Is it a reliable quality metric that meets both content and face validity, (b) are the penalties levied in a manner that is fair and achieves meaningful quality improvement, and (c) has there been unintentional harm in the deployment of this process (Psotka et al., 2020; Wadhera et al., 2019)?

Conclusion

The existing literature reviewed in this chapter indicated that the expert consensus for the HRRP implementation was mixed, with several studies showing success in readmission rate decreases, while other scholars contended that the reductions were minor or non-existent (de Oca et al., 2021; McCarthy & Pandey, 2018; Miravitlles & Ribera, 2017). The literature review provided a comprehensive examination of the studies associated with HRRP, reasons for its implementation, what targeted diagnosis, illness, diseases, and conditions were most affected, how it was received by hospital administration, and the expert opinion on its success or failure (Joshi et al., 2019; McIlvenan et al., 2015; Samarghandi & Qayyum, 2019; Sun et al., 2018).

In explaining the symptomology and issues with COPD, past experts noted that this chronic condition was one of the most common readmitting diseases with such reasons for high readmission rates inclusive to the length of stay, poor follow-up healthcare after discharge, and being discharged without home care depression and alcohol use were associated with an increased readmission rate of COPD patients. (Alqahtani et al., 2020; Kerahrodi et al., 2019; Ronaldson et al., 2021). Scholars also pointed out that the increase in comorbidities with COPD increases the risk for readmission, mainly when the comorbidities remained untreated with COPD (Franssen et al., 2018; Kiani & Ahmadi, 2021; Portillo et al., 2018).

Readmission rates for other diseases, conditions, and ailments were found predominant in existing literature, with studies found exploring readmission rate risk for heart failure, pneumonia, chronic renal disease, acute myocardial infarction, coronary artery bypass graft, elective primary total hip arthroplasty, and total knee arthroplasty, and COPD. However, research was abundant for most of these conditions, with limited expert discussions on COPD and decreased readmission rates addressed explicitly at the hospital level. However, many studies focused on such reasons for COPD readmissions, such as length of stay, behavioral and social risks, infection risk, comorbidities, exacerbations, and clinical assistance (Alqahtani et al., 2020; Choi et al., 2018; Couillard et al., 2017; Iacobucci, 2017; Kong & Wilkinson, 2020; Loh et al., 2017; Press et al., 2019; Rachoin et al., 2020; Rinne et al., 2017b; Samsky et al., 2019; Shiroshita et al., 2021; Vogelmeier et al., 2017).

The research established how hospitals previously addressed high readmission rates found patients were being sent home instead of admitted if they were once admitted

to a hospital within the last 30-day. In addition, studies showed that high readmission rates for patients with chronic conditions, such as COPD, were inevitable before implementing HRRP. However, many other researchers suggested that while the HRRP decreased readmission rates, overall, this program increased health problems for many patients.

Studies that discussed methods of reducing readmissions were found, with researchers noting that offering a better quality of care prompted lower rates for such conditions as heart failure (Pugh et al., 2021; Zakaria et al., 2020). Researchers also recognized that even with penalties for high rates of readmissions, certain health conditions and diseases would continue to have high rates (Brunner-La Rocca et al., 2020; Fudim et al., 2018; Gjeka et al., 2021; Gupta & Fonarow, 2018). The research discussed such factors that impacted readmission rates and how these factors were associated with implementing preventive interventions. Much literature focused on case management, social workers, and discharge planning responsible for sending patients home with the appropriate care and follow up (Coffey et al., 2019; Glans et al., 2020; Rice et al., 2021; Russo et al., 2017; Werner et al., 2019). Programs such as CCMP and integrated case management services were discussed as intervention methods to prevent readmissions in high-risk discharged patients (McCants et al., 2019; Wan et al., 2021).

Although much previous literature examined reasons for high readmission rates, there was little discussion by experts observing the effectiveness of policy changes hospitals made in anticipation of CMS implementing HRRP penalties. In addition, a distinct gap focused on whether receiving a penalty correlates with a change in readmission rate in the following year (Demiralp et al., 2018; Ferro et al., 2019; Psotka et

al., 2020; Wadhera et al., 2019). This research was essential to the proposed study because it indicated that hospitals were influenced by the inclusion of COPD into HHRP penalties and supported the need for the current research to determine if the application of HRRP penalties was correlated with a change in COPD readmission at the hospitals.

Nature of the Study

The specific research design included retrospective comparative analysis to address the research questions in this quantitative study. Quantitative research is appropriate when the data explored are numerical or measurable (Johnson & Onwuegbuzie, 2004). Additionally, quantitative methods are appropriate if a researcher focuses on quantifying attitudes, behaviors, opinions, or other variables (Black, 1999; Johnson & Onwuegbuzie, 2004). Unlike qualitative research, quantitative research relies on convergent reasoning rather than divergent reasoning (Black, 1999). This process meant that I analyzed the observed data and discussed the demonstrated results. I did not observe data and extrapolate (Black, 1999). The goal of quantitative retrospective comparative analysis was to determine if a relationship existed between variables (Black, 1999; Fleiss et al., 2003). This goal was appropriate for the current study. I sought to determine if HRRP penalties impact COPD readmission rates.

I used the CMS' (2021b) Fiscal Year 2020 HRRP Supplemental Data File and CMS' (2021c) HRRP data for the state of Indiana. The region was for Indianapolis-based hospitals, but this information was deidentified for this study. There was no permission necessary to access these data, as the data were publicly available. CMS' (2021c) Fiscal Year 2020 HRRP Supplemental Data File was used to collect the HRRP penalty variable for the fiscal year 2020. The COPD rate of readmission variable for the fiscal year 2021

was collected from CMS' (2021c) HRRP data. Data points were from the Indianapolis, Indiana area but were deidentified for this study. Linear regression explained the relationship between HRRP penalties and readmission rates

Definitions

The following definitions were used in this study.

HRRP penalties: In this study, HRRP penalties referred to reducing a hospital's Medicare reimbursement rate the year following that hospital, exceeding allowing readmission rates for COPD (CMS, 2021a).

Indianapolis metropolitan area: Ten counties in central Indiana formed the Indianapolis metropolitan area. These counties included Boone, Brown, Hamilton, Hancock, Hendricks, Johnson, Marion, Morgan, Putnam, and Shelby (Indiana Business Research Center, 2021).

Readmission rate: In this study, readmission rate or hospital readmission rate referred to the rate of people being readmitted to the hospital for COPD treatment within 30 days of being released from the hospital for COPD treatments (Portillo et al., 2018).

Assumptions

Assumptions are aspects of a study that a researcher understands to be self-evident and must be true for the study to have meaning (Theofanidis & Fountouki, 2018). As a quantitative study using secondary data, I assumed that the data collected in both CMS databases were factual and appropriate for addressing the purpose of this study. The credibility of the data bolstered this assumption. As a federal administration, CMS was unlikely to release inaccurate data. I also carefully assessed the appropriateness of the

data before data analysis to ensure the data being leveraged in this study were appropriate for addressing the purpose of the study and research questions.

Scope and Delimitations

Delimitations are deliberate choices made by a researcher to establish the parameters or scope of respective research (Theofanidis & Fountouki, 2018). This research was delimitated in the following ways. First, I used the CMS' (2021b) Fiscal Year 2020 HRRP Supplemental Data File and CMS' (2021c) HRRP data for Indianapolis, Indiana, meaning that all hospitals included in these databases were used in the study. However, hospitals not included in both databases were thus not included in the study.

Additionally, hospitals outside of the Indianapolis metropolitan area were not included. This delimitation was necessary to support the purpose of this study, which was to examine if HRRP penalties in the fiscal year 2020 were correlated with a reduction of COPD readmissions at Indianapolis metropolitan hospitals in the fiscal year 2021. Including hospitals outside of the Indianapolis metropolitan area would not support this purpose.

Limitations

Limitations are unavoidable aspects of a study that occur because of the delimitations made by a researcher (Theofanidis & Fountouki, 2018). There was one expected limitation to conducting the current study. This limitation was inherent to conducting research using secondary data. Both CMS (2021b, 2021c) databases leveraged in this study were publicly available online and contained large sample sizes sufficient for quantitative analysis. Neither database had fees associated with the data, and both databases were publicly accessible. However, the normal limitations of

secondary data analysis did apply. As I did not collect the data in this study, I could not confirm ethical and valid data collection measures. To combat this limitation, I selected data published by reliable sources. In this case of this study, the reliable source was the CMS (2021b, 2021c).

Significance

This study is significant for various reasons. First, this study is significant because it will inform current health administration practice. Findings address a gap in the literature as it is currently unknown if the application of the HRRP penalty for excess readmissions of COPD patients in the fiscal year 2020 reduced rates of COPD readmission at facilities in the fiscal year 2021 (Buhr et al., 2020b; Puebla-Neira et al., 2021). Addressing this gap may lead to information that incentivizes improved hospital performance and reduces practices that do not result in fewer COPD readmissions. In addition, validating HRRP penalties as a successful method for reducing COPD readmission may confirm that this Medicaid/Medicare incentive program reduces healthcare costs and promote quality, which may help guide future policy decisions within the respective hospitals.

In addition to potentially contributing to practice and policy changes, the results of this study may provide data significant for social change. Addressing this problem may lead to positive social change as it can provide more information about how to reduce unnecessary COPD hospital readmissions in the United States. Thus, the goal is improving outcomes for COPD patients.

Summary

COPD is a serious disease that affects an individual's respiratory system (Portillo et al., 2018). In the United States, approximately 23% of patients hospitalized for COPD are hospitalized within 30 days of their hospital release (Portillo et al., 2018; Puebla-Neira et al., 2021). This high rate of hospital readmission for COPD patients is linked to poorer outcomes for that patient, meaning the rate of COPD death and treatment costs are both linked to COPD readmission. Therefore, CMS (2021a) implemented the HRRP to reduce the rate of avoidable hospital readmissions for diseases, such as COPD.

HRRP penalizes the Medicare reimbursement rate of hospitals that exceed allowable readmission rates for diseases included as part of the program. However, it had yet to be examined if hospitals that had received the HRRP penalty for COPD readmission had reduced their rates of COPD readmission the following year. The specific research problem addressed through this study was that it was currently not understood if HRRP penalties were correlated with reducing COPD readmissions at Indianapolis Metropolitan hospitals. The purpose of this quantitative study was to examine if HRRP penalties in the fiscal year 2020 were associated with a reduction of COPD readmissions at Indianapolis metropolitan hospitals in the fiscal year 2021.

Addressing this problem could lead to positive social change as it would provide more information about how to reduce unnecessary COPD hospital readmissions in the United States. This research was guided by the expectancy theory (Vroom, 1965). The specific research design included retrospective comparative analysis to address the research questions in this quantitative study. As a quantitative study using secondary data, I assumed that the data collected in both CMS databases were factual and

appropriate for addressing the purpose of this study. I used the CMS' (2021b) Fiscal Year 2020 HRRP Supplemental Data File and CMS' (2021c) HRRP data for the state of Indiana. In the following section, Section 2, I discuss the methodology used in this study.

Section 2: Research Design and Data Collection

The purpose of this quantitative retrospective comparative analysis study was to examine if HRRP penalties in the fiscal year 2020 were correlated with a reduction of COPD readmissions at Indianapolis metropolitan hospitals in the fiscal year 2021. The dependent variable was the rate of COPD readmissions to Indianapolis metropolitan hospitals, and the independent variable was the application of the HRRP penalty. Thus, the following research questions were asked:

RQ1: Is there a difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

RQ2: Is there a difference in COPD readmission rates in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

RQ3: Is there a difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

In this section, the research design and rationale are discussed. The study's methodology is presented, including a description of the population, sampling procedures, instrumentation, and data analysis plan. Threats to validity are considered, and the ethical procedures are described. The section ends with a summary.

Research Design and Rationale

This study was a quantitative retrospective comparative analysis study. The quantitative method was appropriate in this case, as the purpose of the study was to

determine the relationship between quantifiable variables rather than the lived experiences or observations of participants (Brannen, 2017). Unlike qualitative research, quantitative research would rely on convergent reasoning rather than divergent reasoning. This process meant that I analyzed the observed data and discussed the demonstrated results, rather than observing data and extrapolating to create new meaning as is done in qualitative research (see University of Southern California, 2019). Quantitative methodology was appropriate for the current study, as I sought to determine the relationship between several independent and dependent variables as described in the research questions.

This study was retrospective. Retrospective designs are useful when examining a phenomenon that has already happened instead of a phenomenon in progress (Goldberg et al., 2014). A quantitative retrospective research design was consistent with research designs needed to advance knowledge related to the relationship between HRRP penalties and COPD readmission rates. There was insufficient data to determine the relationship between these three variables during this study. I used the methodology and design to contribute to the current literature by exploring the relationship between these quantifiable variables (e.g., Brannen, 2017) captured and recorded in the CMS databases.

Finally, this study was comparative. A comparative study design was appropriate as this study sought to compare findings from 2020 to findings from 2021. Other research designs, such as an experimental or case-control study, would not be correct. An experimental design was inappropriate as an experimental design was a clinical design that involves manipulating an independent variable to affect a dependent variable. A case-control study examines the differences between cases (individuals exposed to the

independent variable) and control groups or individuals not exposed to the independent variable (Esser & Vliegenthart, 2017). Although a case-control study could examine the relationship between HRRP penalties and COPD readmission rates, it could not examine the differences between 2020 and 2021. Thus, a comparative study design was more appropriate in the case of the current study.

Methodology

This section discusses the details related to the methods used in this research. First, I discuss the population of interest and the operationalization of variables. Then, the data analysis plan is presented.

Population

The population for this study was hospitals in Indianapolis, Indiana that received Medicare reimbursement in 2020 and 2021. In 2021, the total population was 486 hospitals (CMS, 2021a). These hospitals were all captured in the CMS' (2021b) Fiscal Year 2020 HRRP Supplemental Data File and CMS' (2021c) HRRP data. Therefore, the study population included 100% of the hospitals receiving Medicare reimbursement in Indiana in 2020 and 2021 (n = 486). No sampling methods were used in the study, as no samples were taken.

Operationalization of Variables

The following variables were considered in this study:

Hospital Readmissions Reduction Program Penalties for 2020

This variable was an independent variable in the study. CMS' (2021b) Fiscal Year 2020 HRRP Supplemental Data File was used to collect this variable. This variable was binomial.

Chronic Obstructive Pulmonary Disease Rate of Readmission for 2020

This variable was a dependent variable in the study. It was collected from CMS' HRRP data (2021c). This variable was continuous.

Hospital Readmissions Reduction Program Penalties for 2021

This variable was the second independent variable in the study. CMS' (2021b) Fiscal Year 2020 HRRP Supplemental Data File was used to collect this variable. This variable was binomial.

Chronic Obstructive Pulmonary Disease Rate of Readmission for 2021

This variable was the second dependent variable in the study. It was collected from CMS' HRRP data (2021c). This variable was continuous.

Data Analysis Plan

Once the data were collected, the analysis involved a linear regression in testing the relationship between HRRP penalties and COPD readmission rates for 2020 and 2021. Finally, a *t* test was conducted to determine if the difference between 2020 and 2021 readmission rates was statistically significant. Before running the regression, I checked the assumptions of linear regressions to ensure the criteria were met. These assumptions included a linear relationship between the variables, that variance-covariance matrices were homogeneous, and that there was multicollinearity (Laerd Statistics, 2019).

As there was only one independent variable for each year of data examined (HRRP penalties), I did not need to evaluate the possibility of multicollinearity. Multicollinearity occurrs when two or more of the independent variables in the regression are strongly correlated with each other (see Christensen, 1997). If so, I might not

determine which variable contributed to the relationship with the dependent variable (see Christensen, 1997). However, that situation did not apply in this study.

I also conducted the descriptive statistical analysis, including an analysis of descriptive statistics, such as mean, medians, and rate. These descriptive analyses determined the involvement of HRRP penalties on COPD readmission rates. For example, I presented the mean rate of COPD readmission for hospitals that did and did not receive HRRP penalties in the previous year. I also presented the mean change in COPD readmission rates in hospitals that had received the HRRP penalty in the prior year.

Threats to Validity

There were a few threats to the external validity of the study. First, the CMS (2021a) databases leveraged in this study were almost certain to be comprehensive and nonbiased due to the necessary reporting requirements for CMS. For example, all hospitals leveraging Medicare funding were required to report COPD readmission rates to CMS (2021a). Therefore, it would be illegal for hospitals to misreport this information, and any errors would likely be caught. Furthermore, it was unlikely CMS (2021a) would not include any hospitals in the database due to the standardized nature of data collection.

There were several threats to the internal validity of the study. These assumptions included a linear relationship between the variables, that variance-covariance matrices were homogeneous, and that there was multicollinearity (Laerd Statistics, 2019). I ensured that these assumptions were accurate and reflective of the data before the analysis. I accounted for these threats by checking the assumptions of the linear regressions before running them and transforming the data as appropriate (e.g.,

Christensen, 1997) or selecting a new test if the transformation of the data cannot account for these issues in the data.

Ethical Procedures

I followed several ethical procedures to ensure the study was completed ethically. This process entailed seeking Institutional Review Board (IRB) approval from the Walden review board before beginning data collection. (IRB approval number is 02-28-22-0998590). In addition, I reported all study findings accurately and clearly to ensure that results were factually represented and could not be misinterpreted. Because all data used were already deidentified, there was no need to ensure further confidentiality of participants. However, I discussed all findings in aggregate, so individual participants were not unduly singled out.

Summary

The purpose of this quantitative study was to examine if HRRP penalties in the fiscal year 2020 were correlated with a reduction of COPD readmissions at Indianapolis metropolitan hospitals in the fiscal year 2021. This study was a quantitative retrospective comparative analysis study. A quantitative study was appropriate in this case, as the purpose of the study was to determine the relationship between quantifiable variables rather than the lived experiences or observations of participants (see Brannen, 2017).

Retrospective designs were useful when examining a phenomenon that has already happened instead of a phenomenon in progress (Goldberg et al., 2014). Further, a comparative study design was appropriate as this study sought to compare findings from 2020 to findings from 2021. The population for this study was hospitals in Indiana that had received Medicare reimbursement in 2020 and 2021. In 2021, the total population

was 486 hospitals (CMS, 2021a). These hospitals were all captured in the CMS' (2021b) Fiscal Year 2020 HRRP Supplemental Data File and CMS' (2021c) HRRP data.

The study population included 100% of the hospitals receiving Medicare reimbursement in Indiana in 2020 and 2021 (n = 486). Therefore, no sampling methods were used in the study, as no sample was taken. Once the data were collected, the analysis entailed performing a linear regression to test the relationship between HRRP penalties and COPD readmission rates for 2020 and 2021. Finally, a t test was conducted to determine if the difference was statistically significant between 2020 and 2021 readmission rates.

Before conducting the regression or the t test, I checked the assumptions to ensure both were met. External threats to validity were unlikely due to the reliability of the data. Internal threats were minimized by selecting appropriate statistical tests for the data. I followed several ethical procedures to ensure the study was operated ethically, such as seeking IRB approval from the Walden review board before beginning data collection. I reported all study findings accurately and clearly to ensure that results were factually represented and could not be misinterpreted. Because all data used were already deidentified, there was no need to ensure further confidentiality of participants. In the following section, Section 3, I discuss the data collection methods and the data collected.

Section 3: Presentation of the Results and Findings

The purpose of this quantitative retrospective comparative analysis study was to examine if HRRP penalties in the fiscal year 2020 were correlated with a reduction of COPD readmissions at Indianapolis metropolitan hospitals in the fiscal year 2021. The dependent variable was the rate of COPD readmissions to Indianapolis metropolitan hospitals, and the independent variable was the application of the HRRP penalty. The following research questions guided the analyses for this study:

RQ1: Is there a difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

$H_0$1: There is no difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

H_a1: There is a difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

RQ2: Is there a difference in COPD readmission rates in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

$H_0$2: There is no difference in COPD readmission in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

H_a2: There is a difference in COPD readmission rates in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

RQ3: Is there a difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

H_03: There is no difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

H_a3: There is a difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

This chapter includes a discussion of the procedures used for data collection from a secondary data set. Then, I discuss the results of the descriptive analysis, assumptions testing, and hypothesis testing conducted to address the research questions of this study. Finally, the chapter ends with a summary of the key findings for this study.

Data Collection and Secondary Data Set

As described in Section 2, the data for this study were gathered from the CMS' (2021b) Fiscal Year 2020 HRRP Supplemental Data File and CMS' (2021c) HRRP data. I downloaded data from the HRRP electronic databases into a Microsoft Excel sheet. Data from 2020 and 2021 were gathered to compare the difference between the 2 years.

The CMS Hospital Readmission Data (2021b, 2021c) included hospital readmission data from 100s of hospitals from different states. However, the focus of this

study was on Indianapolis hospitals, exclusively. I cleaned the data to remove any incomplete entries in each data sheet to remove extraneous data. Then, I compared hospitals' CMS certification numbers (CCN) against the data to ensure all data collected were from Indianapolis hospitals only. All other data points were removed from consideration in the data analysis. Therefore, the data were isolated to Indianapolis hospitals.

From the data set, only nine hospitals were from Indianapolis, but one hospital had incomplete data when the 2020 and 2021 data sets were compared. The analysis for this study only included eight hospitals. All available data for Indianapolis were gathered for the study. Thus, the sample was representative of the hospitals in Indianapolis.

Results

Descriptive Statistics

Data for this study were from Indianapolis metropolitan hospitals. A total of nine hospitals from Indianapolis were included. However, among the nine hospitals, one did not have data on COPD readmission rates for both 2020 and 2021. Therefore, only eight hospitals were included in the analyses. Table 1 presents the descriptive statistics of the COPD readmission rates for 2020 and 2021. Based on the results presented in Table 1, 2021 had a higher mean COPD readmission rate (M = .9759, SD = .046) compared to 2020 mean COPD readmission rate (M = .9521, SD = .051).

TABLE 1

DESCRIPTIVE STATISTICS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE READMISSION RATES

	Mean	*N*	Std. deviation	Std. error mean
2020 ERR for COPD	0.9521	8	0.05053	0.01787
2021 ERR for COPD	0.9759	8	0.04619	0.01633

Table 2 presents the frequencies and percentages of the penalty for excess COPD patient readmissions in 2020 and 2021. In 2020, only one hospital had implemented the HRRP penalty for excess COPD patient readmissions, and seven hospitals had not implemented the HRRP penalty for excess COPD patient readmissions. The mean COPD readmission rate for the hospital implementing the HRRP penalty for excess COPD patient readmissions was 1.0060. The mean COPD readmission rate for the hospitals that did not implement the HRRP penalty for excess COPD patient readmissions was .9444 (*SD* = .049). In 2021, two hospitals had implemented the HRRP Penalty for excess COPD patient readmissions, and six hospitals had not implemented the HRRP Penalty for excess COPD patient readmissions. The mean COPD readmission rate for the hospital that had implemented the HRRP Penalty for excess COPD patient readmissions was 1.0292 (*SD* = .0289). The mean COPD readmission rate for the hospitals that did not implement the HRRP Penalty for excess COPD patient readmissions was .9581 (*SD* = .036).

TABLE 2

FREQUENCIES AND PERCENTAGES OF HOSPITAL READMISSIONS REDUCTION PROGRAM PENALTY FOR EXCESS CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENT READMISSIONS

		N	Mean	Std. deviation
2020 ERR for COPD	Yes	1	1.006	
	No	7	0.9444	0.04926
2021 ERR for COPD	Yes	2	1.0292	0.02892
	No	6	0.9581	0.03612

Statistical Assumptions

The data gathered for this study only included eight hospitals. The statistical tests for this study included an independent samples *t* tests and dependent samples *t* test. For the independent samples *t* test, assumptions were independence of observations and normality. The observations for this study were independent because the hospitals were either classified as implemented penalties or did not implement penalties. For the normality of data, Shapiro-Wilk's tests were conducted. Based on the Shapiro-Wilk test results, the data were normally distributed for 2020 (Shapiro-Wilk's = .912, p = .371) and 2021 (Shapiro-Wilk's = .879, p = .182). However, an independent samples *t* test required a minimum of 64 samples for each independent group. This study involved a small sample size of eight samples. Therefore, nonparametric tests were conducted to address the research questions.

Nonparametric tests were used when the data did not follow the normal distribution or when the sample size was small. Nonparametric tests focused on

comparing the medians rather than the mean. Thus, the number of samples did not affect the results of nonparametric tests.

TABLE 3

NORMALITY TEST RESULTS

	Shapiro-Wilk		
	Statistic	*df*	Sig.
2021 ERR for COPD	0.912	8	0.371
2020 ERR for COPD	0.879	8	0.182

Findings

Research Question 1

The 2020 COPD readmission rates were compared based on implementing the HRRP Penalty for excess COPD patient readmissions. THE Mann-Whitney U test was conducted, the nonparametric counterpart of the independent samples *t* test. Table 4 shows the result of the Mann-Whitney U test. The result showed that the mean rank of COPD readmission rates for hospitals with no implementation of HRRP penalty for excess COPD patient readmissions group was 4.00. The mean rank of COPD readmission rates for hospitals with implementation of HRRP penalty for excess COPD patient readmissions group was higher at 8.00. However, the Mann-Whitney U test determined that there was no significant difference in the mean ranks of the COPD readmission rates for hospitals that had implemented and did not implement the HRRP Penalty for excess COPD patient readmissions (Z = -1.528, p = .127). There was insufficient evidence to reject the null hypothesis that there was no difference in COPD readmission in 2020 after

implementing the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

TABLE 4

MANN-WHITNEY U TEST OF 2020 CHRONIC OBSTRUCTIVE PULMONARY DISEASE READMISSION RATES

2020 Penalty indicator for COPD		*N*	Mean Rank	Sum of Ranks	Mann-Whitney U	*Z*	*p*-value
2020 ERR for COPD	No	7	4.00	28.00	.000	-1.528	.127
	Yes	1	8.00	8.00			
	Total	8					

Research Question 2

The 2021 COPD readmission rates were compared based on implementing the HRRP Penalty for excess COPD patient readmissions. THE Mann-Whitney U test was conducted, the nonparametric counterpart of the independent samples *t* test. Table 5 shows the result of the Mann-Whitney U test. The result showed that the mean rank of COPD readmission rates for hospitals with no implementation of HRRP penalty for excess COPD patient readmissions group was 3.50. The mean rank of COPD readmission rates for hospitals with implementation of HRRP penalty for excess COPD patient readmissions group was higher at 7.50. Based on the Mann-Whitney U test result, there was a significant difference in the mean ranks of COPD readmission rates for hospitals that had implemented and did not implement the HRRP Penalty for excess COPD patient readmissions (Z = -2.000, p = .046). There was sufficient evidence to reject the null hypothesis that there was no difference in COPD readmission in 2021 after implementing

the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

TABLE 5

MANN-WHITNEY U TEST OF 2021 CHRONIC OBSTRUCTIVE PULMONARY DISEASE READMISSION RATES

2021 Penalty indicator for COPD		*N*	Mean Rank	Sum of Ranks	Mann-Whitney U	*Z*	*p*-value
2021 ERR for COPD	No	6	3.50	21.00	.000	-2.00	.046
	Yes	2	7.50	15.00			
	Total	8					

Research Question 3

A Wilcoxon Signed-Rank test, the nonparametric counterpart of the paired-samples *t* test or dependent samples *t* test, was conducted to compare the mean ranks of COPD readmission rates for 2020 and 2021. Based on the result in Table 6, data in 2021 had a higher mean than 2020 for seven samples, with a mean rank of 5.00. Data in 2021 had a lower mean than 2020 for one sample, with a mean rank of 1.00. The Wilcoxon Signed-Rank test showed that the 2020 and 2021 COPD readmission rates were significantly different ($Z = -2.380$, $p = .017$). Therefore, there was sufficient evidence to reject the null hypothesis that there was no difference in COPD readmission rates between 2020 and 2021 after implementing the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

TABLE 6

WILCOXON-SIGNED RANK TEST OF 2020 AND 2021 CHRONIC OBSTRUCTIVE PULMONARY DISEASE READMISSION RATES

		N	Mean Rank	Sum of Ranks	*Z*	*p*-value
2021 ERR for COPD - 2020 ERR for COPD	Negative Ranks	1[a]	1.00	1.00	-2.38	0.017
	Positive Ranks	7[b]	5.00	35.00		
	Ties	0[c]				
	Total	8				

Note. a = 2021 ERR for COPD < 2020 ERR for COPD.

b = 2021 ERR for COPD > 2020 ERR for COPD.

c = 2021 ERR for COPD = 2020 ERR for COPD.

The data on payment adjustment factor and ERR for 2020 are presented in Table 7. The range of payment adjustment factors for the nine hospitals was from .9904 to 1.0000. The range of ERR for the nine hospitals was from .86 to 1.01. The highest payment adjustment factor was observed for hospitals 150024 and 150153 while the highest ERR is observed for hospital 150169.

TABLE 7

PAYMENT ADJUSTMENT FACTOR AND ERR FOR 2020

Hospital	Payment Adjustment Factor	ERR
150024	1	0.86
150056	0.9972	0.98
150074	0.9908	0.98
150084	0.9999	0.9
150128	0.9946	0.98
150153	1	0.99
150160	0.9927	-
150162	0.9983	0.92
150169	0.9904	1.01

The data on payment adjustment factor and ERR for 2021 are presented in Table 8. The range of payment adjustment factors for the nine hospitals was from .9889 to 1.0000. The range of ERR for the nine hospitals was from .92 to 1.05. The highest payment adjustment factor was observed for hospitals 150024 and 150153 which is similar to 2020 data. However, the highest ERR was observed for hospital 150074 followed by hospital 150169.

TABLE 8

PAYMENT ADJUSTMENT FACTOR AND ERR FOR 2021

Hospital	Payment Adjustment Factor	ERR
150024	1	0.92
150056	0.9979	0.99
150074	0.9897	1.05
150084	0.9997	0.92
150128	0.9954	0.99
150153	1	0.99
150160	0.9889	-
150162	0.999	0.93
150169	0.992	1.01

Summary

A total of eight Indianapolis Metropolitan Hospitals were included in the analysis. Data were gathered from secondary data of CMS' (2021b) Fiscal Year 2020 and 2021 HRRP Supplemental Data File and CMS' (2021c) HRRP data. Eight samples were insufficient to conduct the independent and paired/dependent samples *t* tests. Therefore, nonparametric tests were conducted to address the research questions. The analyses determined that there was no difference in COPD readmission rates of hospitals that had implemented and did not implement the HRRP Penalty for excess COPD patient

readmissions for 2020. There was a difference in COPD readmission rates of hospitals that had implemented and did not implement the HRRP Penalty for excess COPD patient readmissions for 2021. There was also a significant difference in the COPD readmission rates between 2020 and 2021.

This section included the findings of data analysis and a discussion of the data collected. Section 4 is the concluding section. Information in Section 4 includes a discussion of conclusions, interpretations, limitations, and recommendations for future studies and practices.

Section 4: Application to Professional Practice and Implications for Social Change

The purpose of this quantitative retrospective comparative analysis study was to examine if HRRP penalties in the fiscal year 2020 were correlated with a reduction of COPD readmissions at Indianapolis metropolitan hospitals during the fiscal year 2021. This study addressed the preventable rates of COPD readmissions, which had increased over the past decade (Portillo et al., 2018; Puebla-Neira et al., 2021). Higher preventable readmission rates triggered CMS (2021a) to impose financial penalties implemented through the HRRP, thereby reducing the costs associated with high readmission rates in hospitals. Secondary data were analyzed to observe if Medicare penalties decreased these readmission rates based on comparative data extracted from a CMS (2021b, 2021c) database.

The following research questions, with associated hypotheses tested, guided this study:

RQ1: Is there a difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

$H_0$1: There is no difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

H_a1: There is a difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

RQ2: Is there a difference in COPD readmission rates in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

$H_0$2: There is no difference in COPD readmission in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

H_a2: There is a difference in COPD readmission rates in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

RQ3: Is there a difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals?

$H_0$3: There is no difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

H_a3: There is a difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

The dependent variable was the rate of COPD readmissions to Indianapolis metropolitan hospitals, and the independent variable was the application of the HRRP penalty. The theoretical framework was Vroom's (1965) expectancy theory. This framework provided a lens to understand that hospitals that had implemented the HRRP

penalties through CMS requirements were expected to decrease COPD patients' readmission rates.

Section 4 interprets the findings based on analyzing the collected retrospective data exploring the correlation between the COPD readmission rates and applying this HRRP penalty. A discussion of the limitations and the recommendations are included in this chapter. Subsequently, Section 4 consists of presenting information on the implications for professional practice and social change, with descriptions of the potential impact the results of this study may have on future practices with COPD readmission rates affected by the HRRP penalty. Finally, this section concludes with a summary of key findings.

Interpretation of the Findings

The findings were based on the analysis of CMS (2021b, 2021c) retrospective data incorporated from nine hospitals, with one hospital having no data on COPD readmission rates in 2020 and 2021. The eight hospitals that did have reported data on 2020 to 2021 COPD readmission rates were included in the current study. The descriptive statistics on these hospital data sets showed a higher readmission rate after implementing the HRRP, with readmission of COPD rising from an average of 0.95 in 2020 to an average of 0.98 in 2021.

Research Question 1

RQ1 was the following: Is there a difference in COPD readmission rates in 2020 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals? Data showed that during 2020, the eight hospitals that had reported readmission rates for COPD after implementing the HRRP penalty were

no different from the rates of those who did not implement this penalty. The interpretation of these findings suggested that even though the hospitals, on average, had followed the CMS (2021a) rules for implementing the HRRP, there was no change in COPD readmission rates. Therefore, the results indicated insufficient evidence to reject the null hypothesis. Thus, there was no statistically significant difference in COPD readmission in 2020 after implementing the HRRP for excess COPD patient readmissions in Indianapolis metropolitan hospitals.

These findings were congruent with previous literature discussing readmission reduction rates for all chronic illnesses. Previous efforts to examine the use of HRRP to reduce readmissions of chronic conditions suggested there was no consistency across patient and hospital populations, even to determine if a significance in decreased readmission rates was apparent (Clement et al., 2017; Wasfy et al., 2017; Yakusheva & Hoffman, 2020). When statistically significant results were ascertained, the results indicated that HRRP only modestly reduced readmission rates for most illnesses and conditions (Gupta & Fonarow, 2018; Taylor & Davidson, 2021), with only one-fourth of U.S. hospitals establishing minor reductions (Ibrahim & Dimick, 2019; Kash et al., 2018; Psotka et al., 2020). Additionally, Gupta and Fonarow (2018) and Sandhu and Heidenreich (2019) found that the application of HRRP had increased short-term and long-term mortality following hospitalization.

Research Question 2

RQ2 was the following: Is there a difference in COPD readmission rates in 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals? The findings associated with the data extracted for

2021 from these same eight hospitals showed a significant difference in the mean ranks of COPD readmission rates between those two hospitals that had implemented the HRRP versus those that did not. The results indicated significant evidence to reject the null hypothesis, which stated no difference in COPD readmission in 2021 after implementing the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals. The interpretation of these findings suggested that those hospitals that had followed the CMS rules for implementing the HRRP had produced a decrease in COPD readmission rates during this year.

Current literature showed that HRRP penalties were significantly correlated with decreased COPD readmissions, claiming that these penalties had influenced COPD readmissions by learning that implementing HRRP in a hospital had decreased COPD readmission rates (Chen & Grabowski, 2019; LaBedz & Krishnan, 2020). These researchers claimed the HRRP financial penalties had created a minor reduction in readmission (Gupta & Fonarow, 2018; Sandhu & Heidenreich, 2019; Thompson et al., 2017). Studies further showed that HRRP implementation was correlated with 30-day hospital readmission and 30-day post-discharge mortality rates in COPD patients after discharge (Joynt Maddox et al., 2019). In addition, the COPD readmission rates showed a decrease after CMS announced that COPD would be included in an HRRP program (Puebla-Neira et al., 2021).

Research Question 3

RQ3 was the following: Is there a difference in COPD readmission rates between 2020 and 2021 after implementation of the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals? The data collected and analyzed

based on retrospective data from these eight hospitals showed that the mean of these healthcare facilities that did not implement the HRRP for excess COPD patient readmissions in 2020 failed to lower their readmission rates for COPD. However, in 2021, two hospitals showed an implementation of the HRRP, with a decrease in COPD readmission rates. The findings showed that the COPD readmission rate did not decrease without implementing this penalty. Therefore, the results supported the null hypothesis, which stated that there was no difference in COPD readmission rates between 2020 and 2021 after implementing the HRRP Penalty for excess COPD patient readmissions in Indianapolis Metropolitan hospitals.

The current literature showed mixed results for using HRRP implemented in the hospital environment to decrease readmission rates for COPD patients. The mixed results increased the applicability of expectancy theory in Indianapolis-based hospitals, which expected their staff to provide care that reduced readmissions, thereby maximizing an expectation of satisfaction with outcomes (e.g., the reimbursement rate from Medicaid; Rowley & Harry, 2011; Snead, 1991). The expectancy theory considers the motivation of an individual based on the presence and value of a reward (Snead, 1991). The current study's findings suggested that payment was a disincentive, as hospitals with higher readmission rates had received decreased Medicaid reimbursement rates.

Researchers have examined readmission rates, the HRRP, and CMS requirements for hospital reimbursements in the current literature (Buhr et al., 2020a; Ody et al., 2019; Pedersen et al., 2017; Puebla-Neira et al., 2021). The literature further showed that readmission risks were considered a means for inferring a hospital's quality, and using the HRRP had prompted regulatory information for CMS (2021a; Bradley et al., 2013; Khera

& Krumholz, 2018). Although specific short-term health declines resulted in necessary readmission, evidence showed that 30-day readmission risk was reduced by providing higher quality care (Gai & Pachamanova, 2019; Upadhyay et al., 2019). In addition, researchers found that with a higher standard for quality of care, many medical conditions would have better after discharge outcomes, reducing the need for further hospitalization (Pugh et al., 2021; Zakaria et al., 2020).

The findings from the current study agreed with this research showing that after implementing the HRRP in the eight hospitals, two showed a significant decrease in readmission rates with the second year examined. However, the data did not include other mediating factors, such as standards of care, nurse-to-patient ratios, care after discharge, or specific differences in health conditions. All significantly impacted readmission rates (Aubert et al., 2019; Guisado-Clavero et al., 2018; Mihailoff et al., 2017).

Past researchers have examined the hospital strategies used to reduce readmission rates only to determine the basis of critical measures from data on in-house implemented programs (Bradley et al., 2013). Nevertheless, many researchers have agreed that hospital quality care critically impacts patient readmitting (S. J. Kim et al., 2016; Zakaria et al., 2020). Researchers have claimed that the method or strategy most often used is the hospital focusing on adequate nursing coverage (S. J. Kim et al., 2016; Vernon et al., 2019; Zakaria et al., 2020). Many administrators have relayed that reducing readmission rates should start with quality care during the first admission for any patient. Suitable nurse staffing levels are necessary to ensure quality care is provided to all patients (S. J. Kim et al., 2016; Vernon et al., 2019). Researchers have found that two specific influences associated with readmission rates, including the number of nursing staff at a

hospital and a higher number of RNs on staff, produced lower readmission rates (S. J. Kim et al., 2016; Vernon et al., 2019).

Previous researchers have agreed on one specific item: Readmissions are one of the most expensive costs for a hospital, often costing thousands of dollars per readmission (Lahijanian & Alvarado, 2021; Warchol et al., 2019). Studies have further shown that before implementing the HRRP program, healthcare leaders have acknowledged the constant increase in readmission rates, noting a need to establish strategies to reduce such. Noted strategies are found in multiple studies, with experts positing that identifying high-risk patients with healthcare providers has minimized patients' chances of readmission. The minimization through post-discharge care instructions has provided referrals to a specialist for further care and ensured such resources as home health agencies remain available (Kash et al., 2018; Zakaria et al., 2020). Many current researchers have discussed preventing readmission rates through increased quality of care, methods of discharge planning, and length of stay for high-risk patients (Coffey et al., 2019; Glans et al., 2020; McCants et al., 2019; Pugh et al., 2021; Rice et al., 2021; Russo et al., 2017; Wan et al., 2021; Werner et al., 2019; Zakaria et al., 2020).

Previous researchers have suggested that preventive interventions should be examined based on the lack of literature directly related to COPD readmission rates (Buhr et al., 2020a; Ody et al., 2019; Pedersen et al., 2017; Puebla-Neira et al., 2021). The current study showed that implementing the HRRP made a significant difference by lowering readmission rates for COPD patients but only in the second year of data

extraction. However, the answer to why the decrease occurred in the second year only remained unknown.

Limitations of the Study

The current study's limitations were inherent to conducting research using secondary data. One limitation was the possible lack of accuracy in this secondary data, which might be incomplete depending on the data source and collection method. In addition, the data were unconfirmed as having ethical or valid data collection methods, nor was the accuracy of the data ascertained independently. Thus, any errors in the secondary data set could be reflected in the findings of this current research. These data were collected from reputable sources, the CMS (2021b, 2021c) database, to mitigate this limitation. The CMS databases are widely used for healthcare data and have been used to collect data for decades. As such, I assumed these data were reliable.

Recommendations

Based on the current research results and the associated reviewed literature, the findings of this study facilitated recommendations for future research. Future researchers should continue to complete studies on high readmission rates for COPD patients. This current researcher examined and compared 2 years of data. However, examinations of longer periods may yield novel results. Furthermore, qualitative research is needed to determine the perceptions of healthcare leaders and the implemented prevention programs currently employed.

Further recommendations include examining all preventative measures for readmission rates to determine which methods are most assistive in decreasing these high rates, particularly in patients with high-risk medical conditions. For example, research

suggesting HRRP in reducing heart failure patients' readmission rates was presented because those researchers noted heart failure as a leading cause of high hospital readmission rates (Albritton et al., 2018; Dharmarajan et al., 2013; Khan et al., 2021). The current researcher focused on COPD readmission rates, with little research directly vested in COPD patients. Therefore, the recommendation for further research is to include a direct connection to COPD patients and their readmission rates.

Public health measures implemented during the COVID-19 pandemic may be associated with decreased COPD admissions. These physical and behavioral measures taken during this period to limit transmission of COVID-19 are plausible explanation that may requires further studies to explain COPD admissions phenomenon.

Current literature did not compare differences between prevention strategies. Thus, another recommendation is to compare the success and failure of these strategies among hospitals. It may also be beneficial to determine the perspectives of those directly affected by readmission and readmission rates. Finally, recommendations include expanding the current research to have more than eight hospitals within other regions of the United States, as the number does not provide a comprehensive observation of readmission rate changes.

Implications for Professional Practice and Social Change

Although the HRRP application has occurred for years, it remains largely ineffective in reducing readmission rates, specifically for COPD patients. Although the information extracted from the current study's findings was limited to eight hospitals, the results provided a basis for understanding the significant need for information about reducing unnecessary COPD hospital readmissions in the United States. Healthcare

leaders' awareness of the need to lower their readmission rates was recognized as a crucial topic in the literature. The implications found with the results of this study should prompt and inform current health administration practice by researching for successful methods to decrease the readmission rates for all conditions and COPD.

The results of this study filled the gap in the literature, which claimed not to recognize if the application of the HRRP penalty for excess readmissions of COPD patients in the fiscal year 2020 reduced rates of COPD readmission at facilities in the fiscal year 2021 (e.g., Buhr et al., 2020b; Puebla-Neira et al., 2021)—addressing this gap provided information for healthcare leaders to use incentives for improved hospital performance and reduced practices resulting in fewer COPD readmissions. In addition, validating HRRP penalties as a successful method for reducing COPD readmission would confirm that this Medicaid/Medicare incentive program lowers healthcare costs and promote quality, which could help guide future policy decisions within the respective hospitals.

This information could be used to improve hospital resources, such as staffing to improve patient quality for the health outcomes for COPD patients. This study indicated a significant implication to social change, as providing effective care and reducing excess or unnecessary COPD readmittance would improve the lives of those who had suffered from COPD and the healthcare staff that cares for them. The results presented could be reviewed by healthcare leaders and might trigger changes in hospital policy for readmissions. Addressing this problem prompts a positive social change by offering an array of information about how to reduce unnecessary COPD hospital readmissions information.

Conclusion

Readmission rates for such chronic conditions as COPD will remain high without further investigation on methods to decrease these rates successfully. The results showed a noticeable difference in a readmission rate reduction between the 2 years of 2020 to 2021. However, the current studies' results could not definitively state that applying HRRP penalties for changing COPD readmission at the hospitals was effective long term. The continued examination of this CMS penalty application should be considered. However, the findings compared with the current literature noted that the lowering of such readmission rates constituted a combination of nursing and staffing rates, the type of care received at home, and a patient's condition. The critical analysis of the retrospective data from the CMS database only has provided context for the 2 years with eight hospitals; therefore, further research is needed. Future researchers may add to this knowledge and improve patient care and healthcare practice, especially for COPD patients.

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