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Effects of the Hospital Readmissions Reduction Program on COPD Readmissions and Costs.

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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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the review committee have been made.

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2022

Abstract

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MS, Southern New Hampshire University, 2016

BS, University of Central Florida, 2008

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Healthcare Administration

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Abstract

Readmissions for chronic obstructive pulmonary disease (COPD) are a major contributor to healthcare costs and patient outcomes. The Hospital Readmissions Reduction Program (HRRP) by the Centers of Medicare and Medicaid was implemented to decrease high rates of readmissions for serious medical problems, including COPD. The purpose of this study was to determine whether HRRP resulted in reductions in readmissions and costs for COPD patients. The Donabedian model was used as the theoretical framework to investigate three research questions concerning whether there are statistically significant differences in terms of readmission rates, total charges, and primary type of insurance payment before and after implementation of HRRP. The target population for this study was patients with a diagnosis of COPD who were seen in healthcare systems in Florida before and after implementation of HRRP. Secondary data for the years 2014 to 2017 were obtained through the Healthcare Cost Utilization Project. This secondary data were analyzed using a paired sample t-test and chi-square analysis with the dependent variables readmissions rates, primary payment method, and total charges. Results from this study revealed an increase in overall readmissions rates and average charges post implementation of HRRP in Florida for patients diagnosed with COPD. This information may be used for positive social change by improving the culture of patient care for this specific patient population in Florida. Also, healthcare administrators may find results informative and gain an understanding of effects of HRRP on patient care for COPD patients.

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Dedication

I want to dedicate this to my loving husband, Dan, and three children, Abigail, Madison, and Danielle, who have kept me motivated throughout this process. In addition, my mother and father have always encouraged me to continue with my education.

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      I want to thank my chair Dr. Miriam Ross for her extended support throughout the many life challenges that I have had between growing my family and working as a respiratory therapist during a pandemic that has significantly impacted my profession. I truly could not have done any of this without her support. I would also like to thank all of my committee members, Dr. Ondo and Dr. Mcdoniel, who have continued to encourage and challenge me to continue this process in my academic career.

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Section 1: Foundation of the Study and Literature Review

Introduction

Many disease processes, such as COPD, are being investigated for frequent readmissions within 30 days of discharge. In addition to COPD patients, other diagnoses such as pneumonia, congestive heart failure (CHF), and coronary artery bypass grafts also have high readmission rates (New England Journal of Medicine Catalyst, 2018). In 2010, due to increasing numbers of readmissions, the Centers for Medicare and Medicaid (CMS) implemented the Hospital Readmissions Reduction Program (HRRP). A primary purpose of HRRP is to track costs and numbers of readmissions for high-risk conditions, which may result in penalty payments for hospitals if readmissions are above the national average (Sjoding & Cooke, 2014). Press et al. (2018) said COPD is the third-highest diagnosis for readmissions, and frequency and costs continue to increase. Hospital administrators and healthcare leaders need to understand better ways to improve outcomes and decrease costs for COPD patients, and this study may provide information to facilitate this process.

Problem

Worldwide, the number of COPD patients is approximately 65 million, which affects costs in all countries (Thomas, 2018). According to Patel et al. (2014), COPD readmissions in 2008 cost between $7,242 and $44,909. The projected cost of caring for COPD patients in 2020 is estimated at 49 billion dollars (Thomas, 2018). As mentioned, HRRP was created to reduce readmissions for multiple diagnoses, including COPD. This

study was focused on whether HRRP had an impact on COPD readmissions in Florida and if there is a correlation between readmissions rates for COPD and primary type of insurance payment or patient total charges in Florida. Although there are studies that address readmissions, there is a research gap associated with studies concerning this specific state and comparisons before and after the implementation of HRRP. I addressed this research gap by focusing on a population with a high incidence of COPD. Results of this study may provide hospital administrators with information that could address COPD patients' specific needs and reduce readmissions.

Purpose of the Study

The purpose of this quantitative study was to investigate financial outcomes, primary types of insurance payment, and COPD readmission rates that occurred in the state of Florida before and after implementation of HRRP. Since I focused on COPD readmissions, it was essential to determine if HRRP practices had an effect on lowering readmission rates. The second focus of this study was total charges for patients suffering from COPD readmissions pre-and postimplementation of the HRRP. No other study has investigated the financial impact that occurred postimplementation of COPD readmissions in Florida. The independent variable is implementation of HRRP. Dependent variables were total charges for COPD patients, readmissions rates, and primary type of insurance payment for readmitted patients.

Because healthcare costs are continuing to increase and care of patients is becoming more complicated, evaluation of outcomes related to the HRRP program for

COPD patients in the state of Florida may lead to information about populations that are considered high risk due to their diagnoses. According to Patel et al. (2014), there is a negative financial impact for COPD patients due to frequent hospitalizations and community care needs. This study may contribute to healthcare administrators' understanding about whether or not HRRP has decreased readmissions and lowered healthcare costs, which could lead to information about screening and other healthcare programs. Administrators may also address whether new programs and patient services are needed.

<div align="center">**Significance**</div>

This research involved determining the financial and readmission significance for COPD patients after implementation of HRRP in Florida. Quality of treatment has improved since the 2012 enactment of HRRP, and this study addressed these aspects of care. This study may promote positive social change due to increased knowledge of readmission issues in healthcare, which may have positive outcomes for organizations and the communities they serve. It was important to determine if sustainable changes are evident as a result of HRRP implementation. HRRP has become an important process for healthcare leaders who focus on high-risk diagnoses such as COPD. Using this information, healthcare systems can determine if their methods meet those standards, which may or may not reduce healthcare costs for these patients. Positive outcomes of this study may include cost reductions and lower readmission rates for patients suffering from frequent COPD exacerbations within 30 days of their most recent discharge. This

information may be used to improve the culture of patient care for this specific patient population.

Research Questions and Hypotheses

RQ1: Is there a significant difference in readmission rates for COPD patients before and after implementation of HRRP in Florida?

$H_0 1$*:* There is no significant difference in readmission rates for COPD patients before and after implementation of HRRP in Florida.

$H_a 1$*:* There is a significant difference in readmission rates for COPD patients before and after implementation of HRRP in Florida.

RQ2: Is there a significant difference when comparing total charges for COPD readmissions before and after implementation of HRRP in Florida?

$H_0 2$*: There* is no significant difference when comparing total charges for COPD readmissions before and after implementation of HRRP in Florida.

$H_a 2$*:* There is a significant difference when comparing total charges for COPD readmissions before and after implementation of HRRP in Florida.

RQ3: Is there statistical significance when comparing primary type of insurance for readmitted patients to readmissions rates for COPD patients pre and post-implementation of HRRP in Florida?

$H_o 3$*:* There is no statistical significance when comparing primary type of insurance for readmitted patients to readmissions rates for COPD patients pre and post-implementation of HRRP in Florida.

Ha3: There is a statistical significance when comparing primary type of insurance for readmitted patients to readmissions rates for COPD patients pre and post-implementation of HRRP in Florida.

The independent variable was HRRP, and the dependent variables were total charges for COPD patients, readmissions rates, and the primary type of insurance payment method the patients used while admitted.

Theoretical Foundation for the Study

The Donabedian model was used as a foundation for this study to investigate COPD readmission and whether HRRP has made a difference in terms of costs and readmissions. The Donabedian model was created by Avedis Donabedian in 1966. It was used to look at structural and process measures, as well as healthcare system outcome measures (Agency for Healthcare Research and Quality [AHRQ], 2011). Using this theory and framework allowed the researcher to take a further look at processes that were involved during implementation of COPD readmission teams. This process may benefit healthcare leaders with responsibilities for restructuring medical support, implementing new protocols and medical management, and determining changes needed to improve quality and care. Results of this study may reveal whether restructuring, training, and penalties were beneficial or not for healthcare systems in Florida. The Donabedian model was appropriate for this study due to readmissions and costs associated with structural measures, processes, and outcomes which relates to this model.

Nature of the Study

A nonexperimental quantitative correlational research approach was used to evaluate the three research questions. A paired sample T-test was also used to determine relationships along with a chi-square analysis. This type of analysis was most appropriate when examining and analyzing this secondary data. Additionally, a correlational analysis was used to effectively explore relationships between variables, which was the main focus of this study. The three research questions involved determining differences in terms of costs and readmissions for COPD patients after implementation of the HRRP program. This program was authorized by the Centers for Medicare and Medicaid (CMS) in 2010 to encourage reductions in cost and improvements in quality for high-risk patients (LaPointe, 2019). Secondary data were obtained from the State Inpatient Database (SID) for the state of Florida through the HCUP project.

Literature Review Introduction

The purpose of this literature review was to research variables that may be influential when looking at readmission penalties post HRRP for COPD patients. The key variables for this study were implementation of HRRP, COPD readmissions, insurance coverage, 30-day readmissions, CMS readmissions, costs of readmissions, and COPD readmissions in Florida.

Search Strategy and Key Terms

A literature review was conducted using the following databases: PubMed, ProQuest, Medline, and EBSCO Host through the Walden University Library along with Google Scholar.

The following keywords were used for this literature search: *HRRP*, *Hospital Readmissions Reduction Program*, *COPD*, *chronic obstructive pulmonary disease*, *COPD treatment plan*, *insurance coverage*, *readmissions*, *Donabedian*, *30-day readmission*, *CMS readmissions*, *cost for readmissions*, and *COPD readmissions in Florida*. I used articles published between 2018 and 2022, although older literature was used when current literature did not meet study requirements.

Literature Review Related to Key Variables and/or Concepts

HRRP

The HRRP was created due to higher levels of readmission rates involving specific disease processes or medical procedures (Goto et al., 2017). These high levels of readmissions were due to poor quality of medical treatment and safety (Wasfy et al., 2016). To improve patients' quality of care and safety in the healthcare system, a program was passed to govern US healthcare systems. This came with the passage of the Affordable Care Act (ACA) in 2010. As part of the ACA, the HRRP was created in 2012.

Frequent readmissions to hospitals for chronic diseases can cost patients and healthcare systems millions of dollars every year. The Center for Medicare and Medicaid Services has developed programs such as the HRRP to hold these healthcare companies

responsible for providing sufficient healthcare to patients and prevent frequent returns to

hospitals for the same concerns. As part of the initiative to reduce costs, the HRRP

program was implemented in 2012 with the main focus on three disease processes:

pneumonia, acute myocardial infarction (AMI), and heart failure. Four other disease

processes were suggested and later included, which were "chronic obstructive pulmonary

disease (COPD), coronary artery bypass graph (CABG), percutaneous transluminal

coronary angioplasty (PTCA) along with other vascular conditions" (Gu et al., 2014, p.

821). COPD was not included until the fiscal year of 2015 (Goto et al., 2017). I looked at

unintended consequences due to implementation of the HRRP at hospitals that serve

underprivileged and lower socioeconomic status patients.

Carey and Lin (2016) said HRRP has some deficiencies when involving case

mixes and this affects some hospitals when looking at HRRP and penalties. There is a

need for some adjustments to how safety-net hospitals are being penalized due to the

HRRP due to the set-ups they use. These safety-net hospitals are considered to have a

higher number of low-income patients, which may lead to higher levels of readmissions

before passing of the HRRP (Carey & Lin, 2016). Wasfy et al. (2016) questioned whether

there was enough of a decrease in readmission rates post-implementation of HRRP to

justify means of penalizing healthcare systems.

When looking at positive outcomes due to implementing HRRP, there has been a

decrease in hospital readmissions ranging from 1-2% (Joynt et al., 2020). Other positive

outcomes that came from implementation of HRRP include using this method of

reimbursement for the Skilled Nursing Facility Value-Based Payment Program, Medicare

Shared Savings Program, and Physicians Value-Based Modifier Program. Overall, the

purpose of HRRP is to link consequences of payment to quality of healthcare that is

being provided for specific diseases which include COPD and readmission rates over a

30-day window.

COPD

Among the disease processes that are addressed by HRRP, COPD is ranked

highly in terms of readmission rates. With more than 16.4 million people suffering from

COPD in 2020, it is the third leading cause of death worldwide (American Lung

Association, 2021). COPD is a disease process that many people do not realize that they

have until they have been officially tested. It includes two different conditions:

emphysema and chronic bronchitis. With either of these conditions, patients develop

symptoms involving shortness of breath or congestion of the lower airways, which leads

to an event called an exacerbation. This disease process is not considered to be reversible,

but it can be managed to prevent reoccurring exacerbations (Muller et al., 2016).

Along with patients suffering from acute or frequent exacerbations of COPD, they

may also have other healthcare conditions that can lead to further complications of their

disease management. Patients who suffer from other comorbidities such as chronic renal

failure have a higher risk of affecting their COPD symptoms, making it more challenging

to manage them as whole patients (Terzano et al., 2017). Other conditions may include

diabetes, depression, and anxiety, which lead to poor prognoses for patients suffering

from COPD (Terzano et al., 2017). Patients end up in the hospital more frequently than those who are not suffering from the same comorbidities, which will in turn increase overall costs of patients' care (Terzano et al., 2017).

Exacerbations of COPD

Exacerbations of COPD can occur for many reasons. These reasons include having other comorbidities such as diabetes or heart failure. Buhr et al. (2020) said readmissions after an exacerbation were due to other comorbidities and not COPD symptoms among 55% of patients.

An exacerbation of COPD is determined when the patient is exhibiting symptoms involving flare-ups which can be attributed due to many different reasons. Factors that can cause exacerbation include increased airway swelling and increased mucous production due to an infection. Because many factors can cause exacerbation of COPD, there has been an increase in overall healthcare costs due to reoccurring readmissions from these exacerbations. Exacerbations account for 50-75% of the economic burden that comes from patients returning within the 30-day window (Dhamane et al., 2015). According to Press et al. (2018), these frequent readmissions lead to almost $15 billion in direct costs that Medicaid and Medicare can avoid.

30-Day Readmissions for COPD Patients

Frequent readmissions have been a significant concern for patients suffering from COPD. According to Press et al. (2018), hospitals have made many efforts to address patients suffering from frequent COPD readmissions. In many of these cases, with

patients suffering from acute exacerbations, healthcare systems are shifting money into other processes to help prevent these patients from returning (Press et al., 2018). This can present many challenges when trying to reduce 30-day readmissions. Issues such as low socioeconomic status, psychosocial issues, and comorbidities make it challenging to focus on true causes of 30-day readmissions due to COPD factors (Zhong et al., 2017). Other areas that raise concerns in terms of readmissions are clinical factors, quality and access, and socioeconomic resources (Prieto-Centurion et al., 2013). Hopefully, this will help reduce the readmission for COPD exacerbations and help avoid the penalties that the healthcare systems incur due to the frequent readmissions (Press et al., 2018).

Other factors, such as comorbidities and socioeconomic status, are considered by looking at patients' transitions throughout their hospitalization and discharge processes. Thus, I addressed discharge planning, follow-up care, pulmonary rehabilitation, and education for home care as part of the initiative to decrease COPD readmission rates.

Cost of Readmissions Rates for COPD Patients

Costs of frequent readmissions can become cumbersome on healthcare systems. Many of the costs for COPD patients are related to frequent readmissions (Molinari et al., 2016). In 2010, overall costs for COPD readmissions alone were about $50 billion dollars (Guarascio et al., 2013). This estimate includes direct care costs, including the hospital management side of treatment and care, as well as indirect costs involved when a patient has an exacerbation (Bogart et al., 2020). Indirect costs involve missing work or filing for disability or social security because patients are unable to work (Bogart et al., 2020).

Factors such as level of exacerbation (moderate or severe) influence how much medical treatment may cost overall (Bogart et al., 2020). According to Bogart et al. (2020), a moderate exacerbation requires use of antibiotics or systemic glucocorticoids without hospitalization. Bogart et al. (2020) said severe exacerbations resulted in patients being hospitalized.

Dhamane et al. (2015) said factors such as medications delivery, diagnostic testing or procedures, laboratory testing, and use of healthcare practitioners in and outside of hospital all present economic burdens on the healthcare system. Not only do many studies look at the topic areas such as medication delivery, diagnostic testing, laboratory testing, and the use of healthcare practitioners to examine cost, but they also look at the creation of programs such as smoking cessation and COPD management (Guarascio et al., 2013). Programs include smoking cessation programs which work with patients to help them stop smoking. The program takes patients through steps to guide them to a smoke-free lifestyle. COPD management is a different type of program. COPD management may vary in terms of hospital style of management. COPD management involves providing education and support and teaching patients to develop self-management techniques to improve their quality of life and mitigate frequent readmissions (Lee Health, 2020a).

Other programs such as pulmonary rehabilitation also exist, which can contribute to the overall increase of treatment for patients suffering from COPD exacerbations. With pulmonary rehab, patients are processed through an evaluation to determine their

starting level (Lee Health, 2020b). The evaluation may include spirometry if it has not already been done, a pulmonary stress test, and a list of specific questions to determine the patient's level of fitness and breathing capacity (Lee Health, 2020b).

Insurance Costs and Readmissions

Since readmission penalties are tied to Medicare and Medicaid, it is crucial to determine how many patients are on these services. Ferro et al. (2019) said there is an association between amount of penalizations and Medicare coverage among the original three conditions. According to Ferro et al. (2019), they looked at both the patients using Medicaid and Medicare to determine if there was a change in the readmission rates post-implementation of HRRP. The study by Ferro et al. (2019) said there were decreased readmissions for patients using Medicare or Medicaid. However, when comparing patients who used Medicare to those using Medicaid, the Medicaid group remained higher than the Medicare group for readmissions.

In a study by Zingmond et al. (2018), the authors looked at the impact of HRRP across the insurance types, specifically in California. In this study by Zingmond et al. said the HRRP could influence care outside of traditional Medicare settings. Ferro et al. (2019) the study was used to look at Medicare FFS and Medicare MC, and they noted a more significant than expected reduction in readmissions. Now comparing the study by Ferro et al. (2019), to the study by Zingmond et al. (2018), they both were able to reach the same type of conclusion that There was a reduction in readmissions rates for patients who use Medicare as their insurance coverage and payment method.

Research Gap Strengths and Weaknesses

By looking at information provided in the literature review, it is clear that no one study has looked at the overall effect of implementation of HRRP on financial results in Florida. There has not been one study that has addressed financial impacts due to readmissions caused in Florida. This study involves considering costs that occur due to readmissions within 30 days. I also looked at the effect of type of insurance that patients had before and after implementation of HRRP. I have not been able to find any study that addresses research question during the literature review. This study applies to healthcare systems in the state of Florida. Information gathered from this research may or may not be applied to other healthcare systems across the country.

Conclusion

During the literature review, I examined what HRRP was, how it has affected COPD, what COPD exacerbations are, and how the HRRP affects 30-day readmissions. HRRP is a program that is implemented to improve the quality of healthcare delivered to a specific group of patients with reoccurring readmission rates. One group in particular is patients suffering from COPD exacerbations. It is essential not only to understand if processes implemented to help reduce rates of readmissions are working, but also financial implications of this whole process. To reduce the number of readmissions, many different scenarios came into play that can differ depending on the type of hospital you are looking at and the patients' situations. These situations can also be affected by the types of insurance that the patients have, affecting the following care that the patient

may receive.

Definitions of Frequently Used Terms

Centers for Medicare and Medicaid (CMS): Incorporated as part of the Department of Health and Human Services (HHS) (CMS, 2021).

COPD exacerbation: A patient with a history of COPD that is suffering from worsening symptoms beyond everyday symptoms, which may require extra medical treatment (Burge & Wedzicha, 2003).

CMS readmissions: Readmissions to a hospital within 30 days after being treated for a previous illness related to CMS HRRP criteria (Rau, 2019).

Hospital Readmissions Reduction Program (HRRP): This is a value-based purchasing program through Medicare that works to improve care coordination and communication between healthcare workers and patients to reduce avoidable readmissions through better preparation with discharge planning (CMS, 2020).

Primary Payer: Type of insurance that involves paying first for services up to the limits of their policy (Medicare, 2020).

Readmission penalties: Penalties imposed by CMS due to excessive readmissions for the ten key diagnoses identified by CMS and related to the HRRP criteria (Rau, 2020).

Readmission rates: Percentage of readmitted patients who return to the hospital within 7 days of discharge (Institute for Healthcare Improvement, 2021).

Safety-net hospital: a hospital that serves a large group of patients that cannot pay for healthcare services (Popescu et al., 2019).

Total charges: Costs during admission that do not include professional fees and noncovered charges HCUP, 2008).

Assumptions

An assumption for this study was that the data is representative and accurate for the patient population in Florida. A second assumption concerned the uniformity of the data collection and that the same formatting for all the variables used in this study were appropriately completed. These assumptions are necessary to look at how readmissions, primary type of insurance payment, and total charges were affected by the implementation of HRRP for Florida.

Limitations

This study focused on the state of Florida, and the results may not apply to other states. This study's limitations may include an incomplete history of patient hospitalizations due to a large seasonal population of residents. Restrictions may apply to assigned diagnoses concerning COPD and an accurate designation of readmission. Finally, the study was limited to specific statistical analyses, including non-experimental quantitative correlational research and a paired sample T-tests. These types of analyses were appropriate for this study due to the type of secondary data obtained.

Scope and Delimitations

There were several factors used to evaluate the link between the implementation of HRRP, readmissions rates for COPD patients in Florida, the financial impact of readmissions for COPD patients in the state of Florida, and the relationship between the primary type of insurance payment and COPD readmission rates. The population included patients diagnosed with COPD in Florida.

The researcher used secondary data that was gathered from various hospital settings in Florida. The purpose of this quantitative study was to investigate the financial outcome, primary type of insurance payment, and COPD readmission rates that occurred in the state of Florida before and after the implementation of HRRP. Other factors looked at age, gender, and race to determine a general patient population that had already been readmitted with COPD. Other diagnoses were filtered out of the data set and were not included in this study.

Generalizability

The generalizability of this study was affected by the location of the study. This study focused on Florida and hospitals located within Florida and may or may not be applicable for comparison in other states. Other researchers may utilize the results of this study to compare the variables concerning COPD readmissions in other states. The methodology used in this study may or may not be applicable to studies done in other states with the same type of data.

Internal Validity

In this study, the researcher focused on determining if there was a correlation between HRRP implementation and 30-day readmissions, the primary type of insurance payment, and total charges in Florida. The database containing the secondary data set was collected from multiple community hospitals throughout Florida. By using the appropriate diagnostic codes identified for this study, it was possible to eliminate other disease processes and focus solely on patients diagnosed with COPD.

External Validity

Results of this study may impact the quality of healthcare and financial implications on healthcare for patients suffering from COPD and frequent exacerbations. It may be possible to find a correlation between HRRP and readmission rates and the primary type of insurance payment or total charges for the patient diagnosed with COPD as their primary diagnosis in Florida. This information can then be used to determine if the type of insurance coverage, the total charges, or the rate of readmission in the state of Florida were impacted by the implementation of HRRP.

Potential for Positive Social Change

The potential for positive change resulting from this study will relate to information about readmissions for COPD patients. Readmissions due to COPD exacerbation are a costly event. According to Press et al. (2018), readmissions account for over 15 billion dollars in direct cost to the healthcare systems and other members. Also, noted by Press et al. (2018), 70% of COPD's healthcare costs are due to acute

exacerbations. Any positive changes that can come out of research about COPD readmissions would reduce healthcare systems' overall cost and decrease the percentage of acute COPD exacerbations that occur. By promoting awareness and ways to prevent readmissions, patients have the potential to lead healthier lives in their homes and communities.

Summary and Conclusion

By investigating factors such as primary type of insurance payment, and total charges per patient per visit against the readmissions rates may prove financially valuable for a healthcare administrator. This study may provide information about the rates of readmissions that occur, which may help reduce any penalties that the healthcare system may suffer due to elevated readmission rates. These penalties can be significant when looking at the financial stability of a healthcare system. In a state such as Florida, where a high percentage of the population utilizes Medicare and Medicaid as their primary type of insurance payment, reducing readmissions and developing education programs may improve the reimbursement of healthcare systems.

COPD readmissions are a frequently researched topic. Many studies have examined the factors that cause the patients to have frequent exacerbations, such as the study done by (Garcia-Aymerich, 2003). Other studies, such as the one by Terzano et al. (2017), look at the importance of investigating co-morbidities that may affect patients suffering from COPD. In studies such as the one by Garcia-Aymerich (2003), and Terzano et al. (2017), they also look at the disease processes financial impact. In this

study, there was a comparison of total charges for patients suffering from COPD readmissions before and after the implementation of HRRP in Florida.

Results from this study may help healthcare administrators better understand how HRRP has affected the income revenue to the hospitals due to patients suffering from readmissions for COPD within 30 days in the state of Florida. Florida is important because the information from the CDC indicates that 7.9% of Floridians noted that they were told they had COPD by a healthcare practitioner (Center for Disease Control, n.d.)

Another vital area to consider when looking at readmissions for COPD patients are the type of insurance coverage they use for their healthcare. According to Himes and Kilduff (2019), approximately 20.5% of Florida's population is over 65 years old, meaning they are qualified to obtain Medicare for their medical coverage. With the passing of HRRP and the enactment of the penalty of up to 3% for high rates of readmissions (Rau, 2020), it becomes clear that there is considerable potential for a negative impact on the financial stability of the healthcare system if hospitals are deemed to have higher rates of readmissions than the national average.

Because of this potential impact, it was important to study the financial burden that occurred before the initiation of HRRP and post-initiation of HRRP in Florida to determine the impact. The type of health insurance was examined to determine if there were differences pre and post HRRP in relation to the readmission rate. This information was examined by looking at the data for Florida through the HCUP SID database. Section 1 examined the purpose, research questions, and literature related to the focus of

the study. Section 2 will examine the research design, methodology, power analysis, and data collection for this study.

Section 2: Research Design and Data Collection

Introduction

The main purpose of this quantitative study was to investigate financial outcomes, primary types of insurance payment, and COPD readmission rates in Florida before and after implementation of HRRP. An analysis was done to determine what effect implementation of HRRP had on patients suffering from COPD in Florida. Analysis included COPD readmission rates, primary type of insurance, and total charges for patient visits before and after implementation of HRRP. Secondary data were obtained from the HCUP, and SID in Florida. Section 2 includes the research design, rationale, methodology, and analysis method.

Research Design and Rationale

Research Design

Dependent variables are readmission rates, total charges, and primary type of insurance payment for readmitted patients, which are all types of ratio data due to the nature of analysis. The independent variable is HRRP. The researcher used a quantitative study design that involved retrospective archival data from the HCUP and SID in Florida. The research design for this study was comparable to other studies such as Jiang et al. (2018), which looked at Florida and readmission rates; however, this study was done pre-implementation of HRRP. Jiang et al. (2018) examined the trends in readmission rates, hospital charges, and mortality between the years 2009 to 2014, looking at patients with COPD in Florida. Jiang et al. (2018) used a method of retrospective analysis utilizing the

HCUP database for Florida between the years 2009 to 2014. The study further used a

multivariable logistic regression to determine any patient characteristics associated with

the 30-day COPD readmissions.

The researcher obtained data from the HCUP and SID in Florida to investigate

variables before and after the implementation of HRRP to determine if there was an

impact due to the implementation of HRRP. Data were analyzed via a chi-square analysis

for RQ1 and RQ3 and a paired sample t-test for RQ2 with the following dependent

variables: readmissions rates, primary type of insurance payment method, and total

charges, which are ratio data because values can result in a true zero during analysis. In

current research designs, many different types of statistical analysis can be used to

advance the knowledge collected in the research. Due to the nature of the variables in this

study, a paired sample t-test for RQ2 and chi-square analysis for RQ1 and RQ3 were

used.

Variables

The dependent variables for this study are total charges to patient

accounts, readmission rates, and primary type of insurance payment for readmitted

patients. The independent variable in this study is HRRP implementation.

Methodology

Secondary Data

The SID was created as part of a group of databases used by the HCUP. Initially,

HCUP databases were created as federal-state industry partnerships with the AHRQ

(Metcalfe et al., 2019). The SID consists of information from various community

hospitals throughout the US. There are currently 49 states that participate in the SID,

which includes approximately 97% of U.S. community hospital discharges (HCUP,

2021).

Data are collected every year from the participating states. Data may be collected

from community hospitals or, in some cases, specialty facilities (HCUP-US SID

Overview, 2021). Collected data may include a variety of elements that may be clinical or

nonclinical (American Academy of Otolaryngology-Head and Neck Surgery, 2021).

These elements include discharge status, diagnosis, inpatient procedures, admissions,

payment source, total charges, length of stay, and characteristics of providers and

hospitals (American Academy of Otolaryngology-Head and Neck Surgery, 2021). Data

were collected from all participating states and may vary by state.

As noted by the American Academy of Otolaryngology-Head and Neck Surgery

(2021), there are a few weaknesses related to the uses of the SID. The American

Academy of Otolaryngology-Head and Neck Surgery (2021) said there may be incorrect

or absent coding for some relevant information. The database does not track patients

across state lines, and it cannot account for events that happen outside of hospital

settings. The SID is also not the best approach for making national comparisons since

each state presents a variation of reported elements (American Academy of

Otolaryngology-Head and Neck Surgery, 2021). There are some strengths to using this

information provided in the SID. The SID allows for comprehensive coverage of

approximately 97% of all cases reported in the US. Due to the sheer size of some of the

SID, the database provides researchers the opportunity to study rare outcomes and

diseases (American Academy of Otolaryngology-Head and Neck Surgery, 2021).

To obtain secondary data from the secondary source, an account was created with

HCUP, and further steps were followed prior to obtaining any data. Any intended users

with access to the data needed to complete the online HCUP data use agreement training

tool (HCUP-US SID Overview, 2021). As part of the application process, any

collaborator or primary researcher needed to read and sign the data use agreement for

state databases. As part of the SID application, the researcher also submitted a statement

of intent to use (American Academy of Otolaryngology-Head and Neck Surgery, 2021).

Once the application was approved and no further review was required, the payment was

made and processed. Once these processes were approved, the SID mailed the data to the

researcher (HCUP-US SID Overview, 2021).

Population

The target population was patients with diagnoses of COPD who were

seen in community healthcare systems in Florida before HRRP and after implementation

of HRRP. State inpatient data from 2014 to 2017 were obtained through the HCUP SID.

Power Analysis and Sample Size Estimation

The power analysis and sample size for this study assumed an overall medium

effect between predictor and outcome variables. Based on the study by (Jiang et al.

2018), it is a reasonable assumption for a medium-sized association. It is typical for a

power of 0.80 and alpha of 0.05 to be set (Hunt, n.d.). The required sample size for the

two-tail independent sample t-test was 64 for each sample group (see Table 1). This

power analysis was applied to RQ1 and RQ2. The database being obtained through SID

exceeds these criteria. A power analysis was conducted using Statistical Package for the

Social Sciences (SPSS) and G3 power analysis software. There was no available power

analysis for the chi-square test.

Table 1

Independent Sample T-Test Power Analysis

Independent Sample T-test Power Analysis Utilizing G*Power	
Input	
Tail(s)	Two
Effect size d	0.5
α err prob	0.05
Power (1- β err prob)	0.80
Allocation ratio N2/N1	1
Output	
Noncentrality parameters δ	2.8284271
Critical t	1.9789706
Df	126
Sample Size group 1	64
Sample Size group 2	64
Total Sample Size	128
Actual Power	0.8014596

Secondary Data Analysis Methodology

Proposed Data Analysis Plan

Version 27 of SPSS was used to analyze data obtained from the SID for the years

2014-2017 to determine if there was a link between implementation of HRRP and rate of

readmissions, total charges per hospital admission, and primary type of insurance

payment. The analysis was followed with a paired sample t-test for the second hypothesis and chi-square analysis for questions one and three was used to test the hypotheses. This method aimed to determine if there was a relationship between the dependent variable and the independent variables (Grant et al., 2018). It was unknown if there were any potential covariates and/or confounding variables.

Research Questions and Hypotheses

RQ1: Is there a significant difference in readmission rates for COPD patients before and after implementation of HRRP in Florida?

$H_0$1: There is no significant difference in readmission rates for COPD patients before and after implementation of HRRP in Florida.

H_a1: There is a significant difference in readmission rates for COPD patients before and after implementation of HRRP in Florida.

RQ2: Is there a significant difference when comparing total charges for COPD readmissions before and after implementation of HRRP in Florida?

$H_0$2: There is no significant difference when comparing total charges for COPD readmissions before and after implementation of HRRP in Florida.

H_a2: There is a significant difference when comparing total charges for COPD readmissions before and after implementation of HRRP in Florida.

RQ3: Is there statistical significance when comparing primary type of insurance for readmitted patients to readmissions rates for COPD patients pre and post-implementation of HRRP in Florida?

H_o3: There is no statistical significance when comparing primary type of insurance for readmitted patients to readmissions rates for COPD patients pre and post-implementation of HRRP in Florida.

H_a3: There is a statistical significance when comparing primary type of insurance for readmitted patients to readmissions rates for COPD patients pre and post-implementation of the HRRP in Florida.

Threats to Validity

External Validity

This study consisted of data collected as part of the HCUP database project, specifically for the state inpatient population. Data was collected from the State Inpatient Database for the state of Florida only. However, this database consisted of approximately 97% of the discharges in the community healthcare systems in Florida (HCUP-US SID Overview, 2021). This, however, does not include the private sector and the discharges that occur every year. As of 2019, there were 349 hospitals in Florida (Official USA, 2019). Out of the 349 hospitals, 45 were government managed, 155 are privately owned, and this leaves 149 facilities to make up the difference (Official USA, 2019). The results from this study may not be applicable to other states.

Internal Validity

Because of the study covered the span of a few years, there was a risk to the internal validity due to variations in reporting. Due to maturation over the study's timeframe, there may also be improved patient performance regardless of treatment

(Ohlund & Yu, n.d.). Another threat to validity may occur due to the changing of ICD coding during the timeframe of this study. Due to the inconsistency with coding, the year 2015 was not examined in this study.

Ethical Procedures

While moving forward with acquiring the secondary data set, the researcher was required to complete an online learning course provided by the HCUP data distributor. The data distributor has a set of rules and agreements that a researcher must abide by when using the data for any research. A researcher must agree to abide by the rules that have been outlined in the agreements with HCUP for the use of the data and reporting the data.

Secondary data was used for this study, which prevented this researcher from collecting data directly from participants. The participants in the SID database are protected by the rules and regulations that are presented in the HCUP training course and agreed to through the contracts signed by all parties. For this data to be used in this study, permission from HCUP and permission from the IRB at Walden University were granted.

There are no ethical concerns related to obtaining the secondary data set. There are also no ethical concerns related to the secondary data collection that was obtained from the SID. All data collected in the database was deidentified by the agency and approved by the states before published in the SID. These measures allow for ethical and secure treatment of the data. If missing data was found in the databases, it was excluded from the study

Anonymity of the dataset was essential. The data received from the SID was maintained on the disc the researcher received. The information was uploaded into SPSS for analysis and kept on a private desktop, and all data for this study is password protected. All material will be deleted from the desktop, and all discs will be destroyed upon completion of the research.

Summary

Section 2 includes secondary data which were obtained from the HCUP and SID in Florida between 2014 and 2017. A quantitative analysis was performed on variables via correlational and paired sample t-tests and a chi-square analysis. The researcher aimed to determine if there was a relationship or association between readmission rates for COPD patients before and after implementation of HRRP, total charges acquired during hospitalizations before and after implementation of HRRP, and primary type of insurance payment before and after implementation of HRRP. Additionally, Section 2 includes the methodology for this study, and Section 3 includes statistical results of analyses.

Section 3: Presentation of the Results and Findings

Introduction

The primary purpose of this quantitative study was to investigate financial outcomes, primary type of insurance payment, and COPD readmission rates in the state of Florida before and after implementation of HRRP. Since the researcher focused on COPD readmissions, it was essential to determine if HRRP practices had an effect on lowering readmissions rates (CMS, 2020). The secondary focus involved the total charges for patients suffering from COPD readmissions pre-and post-implementation of HRRP. No other study has investigated the financial impact that occurred post-implementation of COPD readmissions in Florida. The independent variable is HRRP. Dependent variables are total charges for COPD patients, readmissions rates, and primary insurance payment for readmitted patients with COPD. With this information, healthcare administrators can look at trends to help generate programs that help these individuals with a higher probability of readmission due to COPD.

Research Questions

For this study, the research questions are as follows:

RQ1: Is there a significant difference in readmission rates for COPD patients before and after implementation of HRRP in Florida?

H_01: There is no significant difference in readmission rates for COPD patients before and after implementation of HRRP in Florida.

$H_a1:$ There is a significant difference in readmission rates for COPD patients before and after implementation of HRRP in Florida.

RQ2: Is there a significant difference when comparing total charges for COPD readmissions before and after implementation of HRRP in Florida?

$H_02: There$ is no significant difference when comparing total charges for COPD readmissions before and after implementation of HRRP in Florida.

$H_a2:$ There is a significant difference when comparing total charges for COPD readmissions before and after implementation of HRRP in Florida.

RQ3: Is there statistical significance when comparing primary type of insurance for readmitted patients to readmissions rates for COPD patients pre and post-implementation of HRRP in Florida?

$H_o3:$ There is no statistical significance when comparing primary type of insurance for readmitted patients to readmissions rates for COPD patients pre and post-implementation of HRRP in Florida.

$H_a3:$ There is a statistical significance when comparing primary type of insurance for readmitted patients to readmissions rates for COPD patients pre and post-implementation of HRRP in Florida.

Secondary Data

In this section, data collection methods for the secondary data set, time frame of data collection, discrepancies in the secondary data set, current characteristics of the

sample population, and how this analysis relates to the larger population were discussed.

Data and results were also discussed in this section.

<div align="center">**Data Collection, Time Frame, and Characteristics**</div>

Data Collection

IRB approval was received (10.26.202- 0974392) from Walden University; the

secondary dataset that was deidentified was analyzed using SPSS. The secondary data set

was obtained from the SID for the years 2014 to 2017 via the HCUP database, except for

2015, due to changes with ICD coding. Data from 2014 were used to look at HRRP

penalties prior to implementation, and the years 2016 and 2017 were used for to represent

postimplementation of the HRRP. Data were collected for these years from participating

states as well as community hospitals and some specialty facilities. The SID allows for

comprehensive coverage of approximately 97% of all cases reported in the US (see Table

2).

Population

The target population for this study were patients with an admitting diagnosis of

COPD seen in community healthcare systems in Florida before and after implementation

of the HRRP with the intention to focus on readmissions. State inpatient data from 2014

was compared to data from 2016 and 2017. All data were obtained via the HCUP. In

addition, other descriptive variables such as age, gender, and ethnicity were addressed for

a general idea of the patient population; however, they were not used during analysis of

research questions.

Data Filters

Many diseases were included in this sample of data. In addition, as part of data analysis, I excluded diseases processes other than COPD as the admitting diagnosis. For 2014, ICD 9 codes were used to filter data to specify patients with an admitting diagnosis of COPD. The year 2015 involved a combination of ICD 9 and 10 codes used during the conversion process. Because of changes to coding during 2015, data may not fully reflect correct admitting diagnoses and were excluded from this study. During the calendar years 2016 and 2017, ICD 10 coding was used to define diagnoses involving admission in order to filter data (see Table 2).

Exclusions

As noted in Table 2, there were 2,741,984 admissions in Florida in 2014. These admissions included all ICD diagnosis codes. All other diagnoses were excluded to examine only COPD admissions, and patients lacking VisitLink IDs and overlapping admissions were also excluded. This yielded 32,212 admissions with an admitting diagnosis of COPD during 2014. Of these 32,212 individuals, 5,515 patients met criteria for readmissions during 2014.

For the year 2016, the same method of exclusions and inclusions occurred with the admissions of 2,837,863 and yielded a total of 33,625 with COPD as the admission diagnosis for the year 2016. Out of this group, 6,160 patients were readmitted with COPD diagnosis in 2016. In 2017, the database consisted of 2,847,000 admissions for Florida in 2017. After all exclusions/inclusions were considered, there were 41,658

possible admissions with the admitting diagnosis of COPD. Therefore, 7,802 patients were readmitted with a diagnosis of COPD in 2017.

Inclusions

I filtered the dataset further for 2014 to include ICD-9-CM admitting diagnosis for all CMS readmissions, which was relevant to the admitting diagnosis of COPD. It was important to note that ICD-9 coding was used for 2014, and ICD-10 coding was used for 2016 and 2017, as indicated in Table 2. In addition, other variables were included to look further at the population, such as age, gender, and race, which are noted in various tables below.

The primary focus of this study was to investigate COPD readmissions in Florida. The secondary data used for these primary purposes resulted in 5,515 for 2014, 6,160 admissions for 2016, and 7,802 readmissions for 2017, as seen in Table 2. This yielded 19,477 readmissions over the three years for patients with an admitting diagnosis related to COPD. This far exceeds the power analysis performed with a sample size of 128 or 64 samples per each group being tested with a power of .80, an effect size of .5, and $\alpha=0.05$.

There was a change in the plan presented in section two for the analysis of the research questions. As data cleaning and processing took place, it was decided to numerically determine the readmissions values instead of a yes or no answer for the possibility of a more extensive analysis process. Therefore, a chi-square analysis was used instead of a t-test analysis to perform the analysis for research question one.

Likewise, research question two was analyzed as a Paired sample T-test, and research question three was a chi square analysis.

Table 2

Exclusions/Inclusions Per Year for COPD Admissions in Florida

	2014	2016	2017
Total admissions for the state of Florida	2,741,984	2,837,863	2,847,000
Exclusions			
	350 patients with no VisitLink	431 patients with no Visitlink	539 patients with no VisitLink
	10 patients with overlapping admissions.	2 patients with overlapping admissions.	6 patients with overlapping admissions.
	All other diagnoses do not relate to COPD.	All other diagnoses do not relate to COPD.	All other diagnoses do not relate to COPD.
Inclusion			
	ICD-9 with admitting dx for COPD or related	ICD-10 with admitting dx for COPD or related.	ICD-10 with admitting dx for COPD or related.
Total number of COPD patients.	32,212	33,625	41,658
Total number of readmitted patients with COPD.	5,515	6,160	7,802

Descriptive Statistics

The variable descriptives for this study were addressed in this section, including readmissions, primary insurance coverage, and total charges. The non-variable

descriptives are also being looked at to present an overall picture of the patient population in Florida. In Table 3, there is a comparison of the readmissions rates for 2014, 2016, and 2017. The program called HRRP was intended to look at readmissions occurring in 30 days or less to try and encourage a reduction in specific conditions or procedures for unavoidable readmissions (CMS,2020). It is essential to note that readmissions rates for 30 days or less are 36.0% for 2014, 36% for 2016, and 37.4% for 2017, as seen in Table 3 in Florida. This does show an increase in the number of readmissions over the years overall, but the percentage of readmission from year to year are very similar.

Table 3

Readmissions Values in Florida for COPD Admissions

	2014		2016		2017	
	Percent	n	Percent	n	Percent	N
Readmissions ≤ 30 days	36.0	1,987	36	2,218	37.4	2,917
Readmissions ≥ 31 days	63.9	3,528	63.9	3,942	62.6	4,885
Total of readmitted patients		5515		6160		7802

The primary insurance categories noted in Table 4 show the insurance coverage categories in the State Inpatient Database. The various types of coverage are Medicare, Medicaid, private insurance, self-pay, no charge, and others. From Table 4, Medicare was the highest for all three years, with 3,625 admissions in 2014, 4,196 admissions in 2016, and 5,378 in 2017. Medicaid is the second highest, with 891 for 2014, 1,077 for 2016, and 1,304 for 2017. Therefore, when evaluating readmissions for those patients who had

Medicare, this is a substantial number of patients each year compared to the other primary types of insurance. This supports the idea to focus on the larger patient population, which uses Medicare for primary insurance coverage.

Table 4

Primary Types of Insurance in Florida for COPD Readmissions

	2014		2016		2017	
	Readmissions group		Readmissions group		Readmissions group	
	30 days or less	31 days or greater	30 days or less	31 days or greater	30 days or less	31 days or greater
1= Medicare	1268	2357	1478	2718	1972	3406
2= Medicaid	330	561	391	686	490	814
3=Private Insurance	115	185	152	218	168	240
4= Self-pay	82	104	83	131	99	166
5= No charge	17	34	23	45	44	67
6= Other	95	88	91	144	144	192
Group Totals	1907	3329	2218	3942	2917	4885
Missing	251		0		0	
Total overall	5515		6160		7802	

Furthermore, in Table 5, the total charges are reported showing the minimum and maximum for 2014, 2016, and 2017 for all COPD admissions in Florida. The same can be noted from here that the mean total charge from 2014 through 2017 has increased, but this does not fully tell us if the patients are from the 30 days or less readmission or the 31 days or higher readmission group. It simply shows the change in the mean total charge. Other factors may need to be considered, such as inflation. This information can be

further investigated during the analysis of research question 2 to look at the different

readmission categories. Some of the non-variable descriptive are addressed below to

reflect the patient population for each year. Below race, age, and gender are these non-

variable descriptives being investigated.

Table 5

Total Charges for COPD Readmissions in Florida

Total Charges per year	N	Minimum	Maximum	Mean	Std. Deviation
2014	5515	1164	1885146	404763.08	52389.657
2016	6160	1140	894948	46735.45	51084.905
2017	7802	1018	1489803	49736.26	55400.996

Looking at the descriptive statistics for each year in Table 6, it is apparent that the

Caucasian population has the highest percentage of the patient population in all three

years. For example, the Caucasian patient population for 2014 was 80.9%, for 2016, it

was 70.7%, and for 2017 it was 74.3%. Next is the Hispanic population, which was

12.7% in 2014. In 2016 the Hispanic population was 14.1%, but in 2017 it was 12.0%

which was lower than the African American population at 12.7%. This shows that more

Caucasian patients are readmitted for COPD than any other race overall. On the other

hand, the smallest patient population to be readmitted with a diagnosis of COPD was the

Native American population, with admission values of 0.13% in 2014, 0.08% in 2016,

and 0.2% in 2017.

Table 6

Comparison of Race for COPD Readmissions in Florida

	2014		2016		2017	
	Percent	n	Percent	n	Percent	n
1= Caucasian	80.9	4171	70.7	4355	74.3	5795
2= African American	11.75	606	13.9	856	12.7	987
3= Hispanic	12.7	657	14.1	867	12.0	933
4=Asian or Pacific Islander	.23	12	.2	11	0.2	17
5= Native American	.13	7	.08	5	0.2	12
6= Other	.68	35	.08	51	0.6	45
Total		5488		6145		7789
Missing		27		15		13
Total		5155		6160		7802

In Table 7, the intervals for all represented ages in increments of 10 years. When comparing all three years to each other, the highest percentage of COPD readmission was seen in the increment of 61–70-years-old for all three years. This information can prove beneficial when implementing quality care improvement plans and education for patients with COPD.

Table 7

Ages Based on Categories for COPD Readmissions in Florida

	2014	2016	2017

Age Categories (years)	Percent	n	Percent	n	Percent	n
0-10	0	0	.03	2	.01	1
11-20	.02	1	.02	1	.03	2
21-30	0	0	.033	2	.05	4
31-40	.59	33	.57	35	.45	35
41-50	6.46	356	7.09	436	5.74	445
51-60	25.44	1403	25.50	1569	25.17	1964
61-70	30.81	1699	30.02	1847	30.72	2397
71-80	24.30	1340	22.87	1407	24.17	1886
81-90	11.06	610	11.78	725	12.15	948
91-100	1.32	73	2.06	127	1.50	117
101-106	0	0	.03	2	.04	3
		5,515		6,153		7,802

In Table 8, there is a higher admission for COPD for females versus male patients for all three years. This information can also prove helpful when developing educational programs to help reduce readmissions for COPD. In addition, all the non-variable descriptives can be beneficial when trying to investigate trends and patterns for COPD readmissions. Finally, healthcare administrators should utilize this information when creating programs or developing treatment plans and evidence-based practices.

Table 8

Gender for COPD Readmissions in Florida

2014	2016	2017

	%	N	%	n	%	n
Male	44.86	2474	43.36	2671	45.17	3524
Female	55.14	3041	56.64	3489	54.83	4278
Total		5515		6160		7802

Statistical Analysis Types and Explanations

After the descriptive statistics were analyzed for the primary comparisons, the statistical analysis addressed the research questions. The inferential statistical tests used were the chi-square test of independence with the Cramer's V and the Paired Sample T-Test.

Chi-Square Test of Independence

The Chi-square Test of independence examines the association between categorical variables. A nonparametric test cannot determine the causation between the variables (LibGuides: SPSS Tutorials: Chi-Square Test of Independence, 2022). The sample must be a large sample size, there must be an independence of observation, two or more categories for each variable, and they must be categorical variables (LibGuides: SPSS Tutorials: Chi-Square Test of Independence, 2022). Based on standard practices, alpha should be =0.05. Suppose the results are greater than $\alpha = 0.05$. In that case, you conclude that there is not enough statistical evidence to show an association between the two categorical variables, and the null hypothesis is not rejected (LibGuides: SPSS Tutorials: Chi-Square Test of Independence, 2022).

Along with the Chi-square test of Independence, the Cramer's V was used to examine the strength of association or effect size between the categorical variables (IBM Docs, 2021). As noted by Mahmutovic, 2020 if the Cramer's V is greater than $0 - \leq .05$, then there is no or very weak relationship; if the value for Cramer's V is > 0.05 but $< .10$, there is a weak relationship; if Cramer's V is between .14 and .10, there is a moderate relationship, and if Cramer's V between .15 and .24 is a strong relationship. Finally, if Cramer's V is $> .25$, the variables have a very strong relationship (Mahmutovic, 2020).

Paired Sample T-Test

The Paired Sample T-Test is used when comparing the means of two samples that can be paired together either in a pre-post scenario or in different situations (LibGuides: SPSS Tutorials: Paired Samples t-Test, 2022). The paired sample T-test can be violated if the data is unpaired, a comparison of more than 2 groups, and the data is not normally distributed (LibGuides: SPSS Tutorials: Paired Samples t-Test, 2022). In this study, the sample does meet all these criteria except one without certainty. Due to labeling patients in the database, we cannot guarantee that the same patient or patients were being seen or not seen during this three-year investigation due to HIPAA protection to prevent identification. This violates the possibility of confirming that all admissions occurred in all years.

As a secondary part of the interpretation of the paired sample T-Test, Cohen's D needs to be interpreted to determine the effect size of the significant results. To interpret the Cohen's D, the value was analyzed based on the values .0-.19 as trivial, .20 as a

small, .50 as medium, and .80 or higher as large effect size (Téllez, García & Corral-Verdugo, 2015).

Study Results

RQ1

RQ1: Is there a difference in readmission rates for COPD patients before and after implementation the of HRRP in Florida?

To compare the pre and post-implementation of HRRP, the data was analyzed and compared with a chi square analysis and then Cramer's V if appropriate.

In table 9, the Chi-square analysis provides a value of 4617.131 for the Pearson Chi-square, and the p-value is 0.00. The p-value is less than the standard alpha of .05, which means there is statistical significance between the readmissions rates for 2014 to 2016. In this case, the Cramer's V value was .915. A Cramer's V of .915 represents a very strong relationship between the readmissions rates of 2014 to 2016.

As mentioned in Table 3, 1,987 readmissions in 2014 were for 30 days or less, which was 36% of the overall readmitted patients for COPD in Florida. In 2016, there were 2,218 readmissions which are still 36% of the overall readmissions for COPD in Florida. Therefore, according to these values, there is an increase in readmissions for COPD in Florida, but the increase is proportional to the overall rise in readmissions.

Table 9

Chi-Square Analysis for 2014 and 2016 Readmissions for COPD in Florida

	Value	Df	Asymptotic Significance (2-sided)		Value	Approximate Significance
Pearson Chi-Square	4617.131	1	0.00	Phi	.915	.000
Likelihood Ratio	5726.964	1	0.00	Cramer's V	.915	.000
Linear-by-linear Association	4616.294	1	0.00			
N of Valid Cases	5515					

In Table 10, the Pearson Chi-square analysis is 2766.416, and the p-value is .00; this is less than the standard alpha value of .05. This result shows statistical significance when comparing the readmissions rates from 2014 to 2017. In addition, Cramer's V shows a very strong relationship between the readmissions rates of 2014 to 2017.

As mentioned in Table 3, 1,987 readmissions in 2014 were for 30 days or less, which was 36% of the overall readmitted patients for COPD in Florida. In 2017, there were 2,917 readmissions which were 37.4% of the overall readmissions for COPD in Florida. Therefore, according to these values, there is an increase in readmissions for COPD in Florida.

Table 10

Chi-Square Analysis of 2014 and 2017 Readmissions for COPD in Florida

	Value	Df	Asymptotic Significance (2-sided)		Value	Approximate Significance
Pearson Chi-Square	2766.416	1	.000	Phi	.708	.000
Likelihood Ratio	3557.090	1	.000	Cramer's V	.708	.000

Linear-by-linear Association	2765.915	1	.000
N of Valid Cases	5515	1	.000

Since both Chi-square analyses had a p-value less than the standard alpha, this shows statistical significance with a very strong relationship. Therefore, we reject the null hypothesis and accept the alternative hypothesis, which states that there is a significant difference in readmission rates for COPD patients before and after the implementation of HRRP in Florida. According to the results discussed above, there was an increase in readmissions of 30 days or less for COPD patients in Florida when comparing 2014 to 2016 and 2017 for overall numbers.

RQ2

Is there a difference when comparing total charges for COPD readmissions before and after implementation of the HRRP in Florida?

A paired sample t-test is used to compare the means of the readmitted patients in 2014 to 2016 and 2017 with COPD diagnosis. Therefore, we can compare 2014 to 2016 and 2014 to 2017 to determine if there was a difference in the overall mean.

Table 11 revealed the mean charges from 2014 to 2016 (pair 1), and 2014 to 2017 (pair 2) had increased. In pair 1, n = 5515 for both 2014 and 2016. The respective means are 40476.08 for 2014 and 46550.27 for 2016. In pair 2, n = 5515. The mean for 2014 is 40476.08, and for 2017 is 50,166.88.

Table 11

Means of Pre- (2014) and Post-implementation of HRRP (2016 and 2017) of Readmitted

COPD Patients in Florida

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Total Charges for 2014	40476.08	5515	52389.657	705.461
	Total Charges for 2016	46550.27	5515	50520.967	680.298
Pair 2	Total Charges for 2014	40476.08	5515	52389.657	705.461
	Total Charges for 2017	50166.88	5515	56009.982	754.211

According to Table 12, the mean for pair 1 is 6074.196, and the significance level is .00. Looking at pair 2, the mean is 9690.802, and the significance level is .000. Both pairs show a statistical significance with a $p = .000$, which is less than the standard alpha of .005. Cohen's D reveals that this is a trivial effect size and may not represent a larger sample population. Therefore, we would accept the alternative hypothesis that states there is a significant difference when comparing total charges for COPD readmissions before and after the implementation in Florida.

The mean values can be compared when looking at the pre-implementation year to post-implementation years. For example, the mean value for total charges for readmitted patients of 30 days or less was $40,476.08 in Table 11. On the other hand, the mean charge for 2016 for patients readmitted for 30 days or less was $46,550.27, as noted

in Table 11. From these values and the analysis that was performed, it shows that there is

an increase in the mean total charges when comparing 2014 to 2016.

The same method is used to look at 2014 to 2017. As noted in Table 11, the mean

total charge was $40,476.08 for 2014 and $50,166.88 for 2017. Using the analysis above

and the information provided in Table 11, there is an increase in the mean total charges

from 2014 to 2016 and 2014 to 2017. Therefore, it is noted that there is an overall

increase when comparing the mean total charges before implementation of HRRP to post-

implementation of HRRP.

Table 12

Paired Sample T-Test for Total Charges Between Pre- and Post-Implementation of the

HRRP for Readmitted COPD Patients in Florida

			95% Confidence Interval of the Difference				
	Mean	Std. deviation	Lower	Upper	t	Sig. (2-tailed)	Cohen's D
Total Charges when comparing 2014 to 2016	-6074.196	73020.741	-8001.796	-4146.596	-6.178	.000	-.083
Total Charges when comparing 2014 to 2017	-9690.802	76466.645	-11709.37	-7672.237	-9.412	.000	-.127

RQ3

Is there statistical significance when comparing primary type of insurance for readmitted patients to readmissions rates for COPD patients pre and post-implementation of the HRRP in Florida?

To perform this analysis, a chi-square analysis would be the most appropriate. When comparing the readmission rates for 2014 and the type of insurance, we can see that the p-value is 0.00 in table 13. This is smaller than the standard alpha, and this tells us that there is a significant correlation between readmissions and the type of insurance. However, Cramer's V shows a weak relationship between the readmissions type and the primary type of insurance for 2014. Therefore, in this case, we rejected the null hypothesis and accepted the alternative hypothesis, which states there is a statistical significance when comparing the primary type of insurance to the readmissions rates for COPD patients' pre-and post-implementation of HRRP in Florida. Looking at the data from the analysis, the expected values for different insurance types were significantly different from the actual count, which indicates that the variables have a relationship.

When looking at the analysis of the readmissions rates for 2016 and comparing this to the type of insurance, we can see that the p-value is .228 in table 13. This is greater than the standard alpha, and this tells us that there is no significant correlation between readmissions and the primary type of insurance for 2016. Therefore, we accepted the null hypothesis in this case, which states there is no statistical significance when comparing the primary type of insurance to the readmissions rates for COPD patients pre-and post-

implementation of HRRP in Florida for 2016. Therefore, in 2016, there was no association between readmissions and the type of insurance.

When comparing the readmission rates for 2017 and comparing this to the type of insurance, we can see that the p-value is .143 in table 13. This is greater than the standard alpha, and this tells us that there is no significant correlation between readmissions and the type of insurance. Therefore, we accepted the null hypothesis in this case, which states there is no statistical significance when comparing the primary type of insurance to the readmissions rates for COPD patients' pre-and post-implementation of HRRP in Florida. The same is true for 2017 that there is no association between the type of primary insurance and readmissions

During the analysis for each year, only the 2014 results showed a statistical significance with a weak relationship; all other years showed no statistical significance. Therefore, we rejected the null hypothesis and accepted the alternative hypothesis, which states there is statistical significance when comparing the primary type of insurance to the readmissions rates for COPD patients' pre-and post-implementation of HRRP in Florida.

This analysis of the results indicates a statistical significance when comparing the insurance types in 2014, which reflects the pre-implementation of HRRP. However, when looking at the analysis of 2016 and 2017, which reflects post-implementation of HRRP, there is no statistical significance when comparing primary insurance types. This reflects that post-implementation of HRRP yielded no differences between the primary insurance types. This tells us that there was a significance before implementation that is no longer

present post-implementation for the readmitted patients only. This lack of association

between readmissions and primary type of insurance can be related to the changes that

occurred due to implementing HRRP and improved quality of care. As mentioned in

Table 4, the readmissions between the two groups of 30 days or less and 31 days or

greater grew further apart when looking at 2014 to 2016 and 2014 to 2017. Still, the

overall readmissions values also increased for COPD patients in Florida.

Table 13

Chi-Square Analysis of Primary Types of Insurance Versus COPD Readmissions for

2014, 2016, and 2017 in Florida

	Pearson Chi-Square Value	Asymptotic Significance (2-sided)	Cramer's V-Value	Approximate Significance
2014 readmissions	30.549	.000	.074	.000
2016 readmissions	6.902	.228	.033	.228
2017 readmissions	8.246	.143	.033	.143

Summary

Section 3 includes data collection procedures, the collection plan, exclusions and

inclusions, descriptive statistics, and study results, including analysis. Statistical analysis

for this study included the paired sample t-test and the Chi-square analysis with Cramer's

V. My intent was to examine any relationship between readmissions rates, total charges,

and primary type of insurance payment before and after implementing the HRRP for

patients who had been readmitted with a diagnosis of COPD in Florida.

For RQ1, the results from the analysis led to accepting the alternative hypothesis, which stated that there is a significant difference in readmission rates for COPD patients before and after the implementation of HRRP in Florida. In addition, this information revealed a strong association when looking at the readmission rates before HRRP implementation (2014) to post-implementation of HRRP (2016/2017) regarding both 30 days or less and 31 days or greater for readmissions. This information provided the basis for looking into further research.

For RQ2, results led to accepting the alternative hypothesis that a statistical difference existed when comparing total charges for COPD patients before and after implementing HRRP in Florida. However, when looking at the comparison of total charges pre and post-implementation of HRRP, the analysis determined that there is a statistical significance to this analysis, but the overall effect size may be trivial, which can mean that this information may not apply to the larger population. In addition, the mean charges from 2014 to 2016 and 2017 showed a significant increase. This can be related to many factors and may not provide enough information to relate this only to the implementation of HRRP. This information needs to be further investigated and look at other factors that can increase overall costs.

After completing the analysis for RQ3, I accepted the alternative hypothesis, which was there is statistical significance when comparing the primary type of insurance to the readmissions rates for COPD patients' pre-and post-implementation of HRRP in Florida. From this analysis, there was a statistical significance when looking at the

primary insurance types being used before the implementation of HRRP in 2014.

However, when looking further at 2016 and 2017, there was no statistical significance

when comparing primary insurance types for readmitted patients in Florida. This could

mean there was no significant difference in types of insurance post-implementation of

HRRP for patients readmitted in Florida, which existed before the implementation of

HRRP. So, patients using any insurance types listed above had the same chance of being

readmitted within 30 days or less to 31 days or greater post-implementation of HRRP.

From looking at table 4, it is clear that the Medicare category had by far the greater

number of readmissions overall, followed by Medicaid. This holds for all three years and

further proves that Medicare readmissions can have a greater impact if these readmissions

can either be decreased or avoided.

     In the next section, the results from each analysis are discussed. Also, the

practical use of this information and the implications for social change are investigated.

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

Introduction

The primary purpose of this quantitative study was to investigate if there was a relationship between implementation of the HRRP and readmissions rates, primary types of insurance payments, and total charges for patients with admitting diagnoses of COPD in Florida. More than 16.4 million people suffered from COPD in 2020, and it is listed as the third leading cause of death worldwide (American Lung Association, 2021). Because readmissions can become costly to patients and the healthcare system, these trends need to be analyzed. According to Press et al. (2018), these costs are estimated to be up to $50 billion yearly. Therefore, considering the cost of these readmissions, it is important to determine the impact of insurance. I investigated readmissions rates, total charges, and primary type of insurance before and after implementation of the HRRP for COPD patients in Florida.

Findings from the chi-square analysis yielded statistical significance when comparing readmissions rates before and after implementation of the HRRP in Florida with a strong relationship between 30 days or less readmissions compared to 31 days or greater readmissions for 2014 compared to 2017. Also, chi-square analysis comparing differences between primary types of insurance to readmissions pre-and post-implementation of the HRRP in Florida yielded a statistical significance for 2014. However, this was not the case for 2016 or 2017. Finally, paired sample t-test findings

indicated statistical significance; however, the effect size was trivial and may not be representative of the US.

In Section 4, findings of this study are addressed along with the study's limitations and recommendations and implications for social change.

Interpretation of the Findings

RQ1 Analysis

Chi-square analysis led to a value of 4617.131 for the Pearson chi-square, and the p-value is .000. The p-value is less than the standard alpha of .05, which means there is a statistical significance between readmissions rates for 2014 and 2016. Next, a chi-square analysis was performed to compare 2014 to 2017. Results indicated a value of 2766.416 and a p-value of .000, which is less than the standard alpha value of .05. This result shows a statistical significance when comparing readmissions rates between 2014 and 2017. From this, readmissions in 2014, and 2016/2017 have a strong relationship when comparing readmissions for 30 days or less and 31 days or greater for each year.

Since both chi-square analyses had a p-value less than the standard alpha, there was statistical significance. Therefore, the alternative hypothesis was accepted, and there was a significant difference in readmission rates for COPD patients before and after implementation of the HRRP in Florida. This shows a strong relationship between 30 days or less and 31 days or more readmission groups for 2014 to 2016 and 2014 to 2017.

RQ2 Analysis

The paired sample t-test indicated a significance level of .00. for pair 1 (total charges for 2014 to 2016) and .000 for pair 2 (total charges for 2014 to 2017). Both pairs show a statistical significance with a $p = .000$, which is less than the standard alpha of .005. This means I accepted the alternative hypothesis that there is a statistical difference when comparing total charges for COPD patients before and after implementing the HRRP in Florida. In pair one, Cohen's D is -.083, which is a trivial effect size. In pair 2, Cohen's D is -.127, which is also a trivial effect size.

Even though there is statistical significance when comparing the total charges between 2014 to 2016 and 2014 to 2017, the effect may not be seen in the larger population for either pair 1 or pair 2 due to the trivial effect size. Overall, the analysis reveals an increase in the mean total charge when comparing 2014 to 2016 and 2017; this may not apply to larger populations in the US. This can also be due to other contributing factors such as supply shortages, increased cost of medications, and inflation.

RQ3 Analysis

A chi-square analysis was performed for each year to compare readmissions rates to type of insurance. In the analysis for 2014, Cramer's V revealed a value of 0.074, with $p = 0.00$. These results show statistical significance but a weak or lack of relationship between the two variables. Therefore, I rejected the null hypothesis and accepted the alternative hypothesis, which was there is statistical significance when comparing primary type of insurance to admissions rates for COPD patients pre and post-

implementation of the HRRP in Florida. This shows a significant difference when looking at types of primary insurance that patients were using. According to Table 4, the largest group is Medicare, followed by Medicaid. Because these are larger groups, it is essential to try and decrease or stop the number of readmissions for patients with an admitting diagnosis of COPD in Florida.

For the chi-square analysis of 2016, $p = 0.228$ when comparing readmissions to primary type of insurance. Cramer's V revealed a value of 0.033 and a $p = 0.228$. This shows that there was no statistical significance. Therefore, I accepted the null hypothesis that there is no statistical significance when comparing primary type of insurance to readmissions rates for COPD patients pre and post-implementation of the HRRP in Florida. For the year 2016, there was no statistical difference between types of readmissions and primary type of insurance. This means that the Medicare group no longer has statistical significance in terms of having higher readmissions versus other forms of primary insurance.

Cramer's V indicates a value of 0.033, and $p = 0.143$. This shows that there is no statistical significance when performing the chi-square analysis. Therefore, I accepted the null hypothesis that there is no statistical significance when comparing primary type of insurance to readmissions rates for COPD patients' pre and post-implementation of the HRRP in Florida. The same results are indicated for 2017 compared to 2016. This analysis reveals no statistical differences when comparing types of readmissions to

primary form of insurance. Readmissions are not affected by type of insurance, as shown in 2014.

Since 2014 was the only year that indicated a statistical significance when comparing primary type of insurance to readmissions, and the following 2 years did not, postimplementation of the HRRP caused a shift in readmissions. Since Medicare is the largest insurance, implementation of HRRP may have decreased readmissions in the 30 days or less category and increased the percentage of readmissions in the 31 days or greater category.

These overall findings from this study indicated a statistical significance when comparing readmissions rates of 2014 to 2016 to 2017. In addition, when looking at total charges of 2014, this also shows a statistical significance. With RQ3, there was statistical significance when looking at readmissions versus insurance type during 2014, but there was no statistical significance when looking at comparisons between 2016 and 2017. This information may reflect improvements in readmission rates of those with Medicare and/or Medicaid, which would alter overall percentages from data from 2016 to 2017.

Findings of the Literature

Findings in this study revealed a statistical significance when comparing the total charges of COPD patients before the implementation of post-implementation of HRRP in Florida. There was also a statistical significance when comparing the types of insurance each year to the categories of readmissions, with little to no relationship between types of insurance and readmissions categories. These findings are discussed according to the

independent variable, HRRP, and the dependent variables, total charges, the readmissions rates, and primary types of insurance.

HRRP

The HRRP was created due to higher levels of readmission rates in specific disease processes or medical procedures that were being done in healthcare systems (Goto et al., 2017). However, there are questions about the results of implementation of the HRRP and if there was enough of a decrease in the readmissions rates to penalize the healthcare systems. In this study, a few aspects can be looked at to determine if there was a beneficial change to the implementation of HRRP. According to the article found by (Hospital Readmissions Reduction Program (HRRP), 2018), many studies have shown a decrease in readmissions rates since implementation. Still, there have also been many questions about the procedures for these calculations and what other problems have arisen from these penalties (Hospital Readmissions Reduction Program (HRRP), 2018).

Readmissions for COPD Patients

COPD is the third leading cause of death in the US (Puebla et al., 2021). Because of this, COPD readmissions were investigated to determine a better solution for quality care. In prior years there have been many studies done that have investigated the readmission rates of COPD patients. In the study done by Puebla et al. (2021), their results support a decrease in readmission rates for COPD patients during the pre-implementation period and implementation period. However, this does not align with the results of this study. The results show a statistical significance when comparing the

readmission rates of 2014 to 2016 and 2017; however, if you look at the percentage of readmissions for COPD in Florida, the ratio has increased from 36% in 2014 to 36% in 2016 and 37.4% in 2017. This shows an increase of 1.4% in 2017 compared to 2014 and 2016. Still, it should be noted the overall population increased each year and the number of cases being evaluated increased from 5,515 in 2014 to 6,160 in 2016 and 7,800 in 2017 for readmissions with COPD.

Cost of Readmissions

Frequent admissions to a healthcare system, in general, can create a burden not only to the patient but also to the healthcare system. As noted by Molinari et al. (2016), many of the costs for COPD patients come from frequent readmissions. In one of the research questions in this study, the total charges for each year were compared from a pre-implementation to post-implementation of HRRP. There was statistical significance with each pairing during this analysis. However, there was a trivial effect size with this statistical significance, which may not relate when looking at the larger population. So, for Florida, the mean charge increased when looking at 2014 and then 2016 and 2017, but these results may not apply when looking at other states or the United States overall.

Another important aspect to look at was the type of insurance the patient utilizes as HRRP pertains to Medicare and Medicaid patients. In the study done by Zingmond et al. (2018), they looked at both the types of insurance being used by patients. They determined that HRRP may influence the type of care received outside of California's Medicare system (Zingmond et al., 2018). In addition, Ferro et al. (2019) noted an

unexpected reduction in readmissions. Comparing both studies, they both reach a similar conclusion that there is a reduction for those COPD patients that utilize Medicare as their primary insurance.

Insurance and Readmissions

The results from the analysis in this study revealed a statistical significance when comparing the type of primary type of insurance payment for COPD patients to readmissions from 2014 to 2016 and 2017. These results show a significance in 2014 when looking at 30 days or less to 31 days or greater for the various categories. When looking at the largest group, Medicare, the difference between the two readmissions groups in 2014 was less than in 2016 and 2017. In 2016 and 2017, there was an increase in the readmission rates for both 31 days or greater and 30 days or less.

Findings as related to Theory

In this study, the Donabedian model was used as the foundation to investigate the effects of the implementation of HRRP on a few different variables. This model was used to look at the structural measures, the process measures, or the healthcare system's outcome measures (AHRQ, 2011). Due to the possibility of imposed penalties from the implementation of HRRP, the structural measures and system's outcomes are highly important to investigate for patients diagnosed with COPD, but first, it was important to determine if these changes that were being implemented due to the announcement of HRRP had any effect on variables such as readmission rates and total charges.

The findings from this study yielded statistical significance when comparing the total charges for 2014 to 2016 and 2017. There was also a statistical significance when looking at the type of readmission to the primary type of insurance. These results support the impact of the implementation of HRRP for COPD patients in Florida. In addition, these results would be beneficial to investigating the types of processes or structural changes made at various hospitals throughout Florida to combat and improve readmission rates for COPD patients in Florida. Finally, this supported the use of the Donabedian model for this study.

Summary of Key Findings

The analysis was completed using the years 2014, 2016, and 2017 with the exclusion of 2015. The year 2015 was excluded due to the changes of ICD9 to ICD 10 halfway through the year. These results indicate that post-implementation of HRRP, there was a statistical significance between the readmission group of 30 days or less and 31 days or greater when comparing 2014 to 2016 and 2017. In addition, the results indicated there was an increase in the number of readmissions overall between the two groups when looking at 2014, 2016, and 2017. Also, post-implementation of HRRP, there was an increase when looking at the mean charges from pre-implementation of HRRP to post-implementation of HRRP. There are other factors that can affect charges and not just HRRP, and this would require further investigation. The final analysis revealed a significant difference when looking at the primary type of insurance used before implementation of HRRP and the readmission that was no longer present post-

implementation of HRRP. This reveals that post-implementation, the kind of insurance did not affect the chance of readmission.

Limitations of the Study

The results of this study may not apply to other states since the secondary data is specific to Florida, and some of the results have shown this. The limitation of this study is that a secondary data set is being used, and the researcher did not collect the data firsthand. Other limitations can include using VisitLink IDs to identify the patients each year. These can prevent any researcher from knowing if this individual has been readmitted each year, but this is in place to protect the patient's identity. Nevertheless, the results are reliable and valid, but consideration should be given when comparing to other states' results.

Recommendations

Many potential studies can be developed from the information gathered during this study. More research can be done when comparing the different readmission groups with other variables such as age, gender, economic status, and Florida. The first research question addressed the statistical significance when comparing the readmissions before and after HRRP in Florida. Still, it did not differentiate between the various types of admitting diagnoses that can be used for COPD admissions or other admitting diagnoses such as emphysema or chronic bronchitis. Further analysis can be done based on the admitting diagnosis and comparing this to the readmission categories of 30 days or less and 31 days or more. Since there was a significant result when comparing the total

charges for COPD patients in Florida for 2014, 2016, and 2017, it would be interesting to analyze the various readmission groups to determine if one group has a significant result when comparing the total charges over the years.

Implications for Professional Practice and Social Change

From the results of this study, there has been some insightful information about patients in Florida in the years 2014, 2016, and 2017 that were readmitted with the admitting diagnosis of COPD. First, the overall analysis has shown a statistical significance when comparing the readmissions of 2014 to 2016 and 2017, which revealed an overall increase of readmissions in both categories but yielded relatively the same overall percentage of readmissions. When comparing the total charges of 2014 to 2016 and 2017, the results also indicated a statistical significance when looking at the charges prior to implementation of HRRP to post-implementation. The mean charges had increased from 2014 to 2016 and 2017. And finally, the primary insurance type from 2014 to 2016 and 2017 for only readmitted patients with the primary diagnosis of COPD in Florida also had a statistical significance in 2014 that was no longer present in 2016 or 2017. This indicates that the primary type of insurance cannot predict readmission in either category post-implementation of HRRP.

These results can help hospitals and healthcare administrators to determine if the programs that were created had an impact on patients with COPD as the admitting diagnosis in terms of the readmission rates or overall charges, or the information can help to identify if other parts of the programs have helped with readmission rates in Florida.

Besides using the results from the analysis, additional information can be obtained from the descriptive tables to help further develop processes and structural protocols that may be helpful. For example, information relating to age, gender, and ethnicity can prove beneficial for these programs. Other programs, such as those referenced in the study by (Frankfort et al., 2021), were created but did not show the expected results of decreasing the readmissions rates or costs. Programs can be created not only to focus on patients with an admitted diagnosis of COPD but also other factors such as age, gender, and so forth, depending on further research.

In Florida, it is noted that 19.7% use Medicare, and 15% used Medicaid in 2020 (Yang, 2021). Because Florida has a large population of patients who utilize Medicare and Medicaid, it would be beneficial to create programs specific to patients with frequent readmissions. Programs that focus on COPD patients, specifically females in the age bracket between 61 to 70 primarily and then 51 to 60, would be an excellent start. This information can be gathered from the tables at the beginning of this section. If some of these programs already exist, then this information may be helpful to fine-tune these programs to help further decrease the readmission rates for patients with the primary diagnosis of COPD.

Professional Practice

Healthcare administrators are tasked with many challenges, such as improving the patient experience and the quality of care. Still, they must also look at the budget, meet some standards of care, and create new initiatives such as ones involved with lowering

readmission rates. This study shows a difference when looking at the total charge's pre-implementation to post-implementation of HRRP. The results show that the average total charges had increased over the years for COPD patients. This information would be beneficial for a healthcare administrator to see if this increase was with the patients readmitted in 30 days or less or if this was 31 days or greater group. It would also be beneficial to look and see if the cost has increased due to inflation or the actual cost of care per admission. As part of the study, there was a significant analysis when comparing the readmission types to the primary type of insurance. This information can prove beneficial when developing further programs to work with these patients for continuing care and even post-discharge care. From the information provided in the analysis of this question, there was a significance when looking at types of insurance before HRRP implementation in the 2014 analysis, but in the post-HRRP implementation analysis for 2016 and 2017, there was no statistical significance, and this would suggest that the number of readmitted patients are using all the different forms of primary insurance equally. This could support an improvement due to the implementation of HRRP in Florida.

Social Change

Many factors can play a part in high readmissions rates. Walker (2016) noted five factors: health condition, insurance type, timing, demographics and psychographics, and patient engagement. Many of these factors need to be changed to create a positive reaction. Press et al. (2018) noted that 70% of COPD costs are from acute exacerbations.

Readmissions can account for over 15 billion dollars to healthcare systems and other facilities (Press et al., 2018). The cost of readmissions can be affected due to the type of insurance that the patient has and their health condition. Other things that can influence readmissions can be patient engagement, the timing of interventions, and the patient's mental conditions and demographics. Other studies looked at some of these factors, and programs were developed to work on these interventions.

Conclusion

Overall, this study has revealed that the type of primary insurance present does not indicate readmission post-implementation of HRRP. The mean charges have increased post-implementation of HRRP, and the overall readmissions rates have increased in both categories, but the percentage of 30 days or less increased by 1.4%, and the 31 days or greater decreased by 1.3% all in 2017. Many of these results may not be applicable when looking at the relationship for other states or even looking at the entire United States. Other factors must also be considered when looking at these results, such as economic stability and increasing cost of medications and salaries, which may influence the total cost per admission. Also, depending on the severity of the exacerbation with COPD greatly affects the overall cost of the admission. Further studies will need to be conducted to determine if other factors have influenced these results.

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