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Relationship between Healthcare Provider Communication and Preventable 30-Day COPD Readmission Rates

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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Abstract

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Doctor of Healthcare Administration

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Abstract

The Centers for Medicare and Medicaid Services implemented the Hospital Readmission Reduction Program in 2012. Ten years later, hospitals across the United States have had negligible improvement in reducing preventable 30-day hospital readmissions for COPD patients. Healthcare, specifically the hospital setting, consists of complex processes and procedures. Not one process or procedure is the sole cause of correcting excessive preventable 30-day readmissions of patients with COPD. The essential elements of provider communication were studied using the Complex Adaptive Systems theory in this quantitative study. Each fundamental element of provider communication was the independent variable, and the preventable 30-day COPD excessive readmission ratio was the dependent variable. This correlational-quantitative study utilized the HRRP COPD excess readmission ratio for hospitals in Los Angeles, California. The independent variables were HCAHPS linear measure scores of Communication with Nurses, Communication with Doctors, and Communication about Medicines. The dependent variable was HRRP's preventable 30-day COPD excess readmission ratio. The regression analysis utilized in this study did not find a statistically significant relationship between the independent and dependent variables. Implications for positive social change from this study were that certain types of provider communication did not reduce preventable 30-day COPD readmissions.

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Dedication

I first dedicate this project to my dad. Thank you for your daily encouragement and for making me believe I can accomplish anything. I also dedicate this project to my friends and family, who supported me while I took on this journey. Your constant encouragement during the most challenging moments was everything I needed to power through. Thank you for your understanding and patience and for continuing this journey with me.

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I want to acknowledge Dr. Kevin Broom and Dr. Kimberly Ondo for guiding me along my journey. Thank you both for being the calming reassurance I needed from the start of my study to the finish. Without your guidance, I doubt I would have made it to the end of my journey.

I want to offer a special acknowledgment to Dr. Sedrick Bedolla. As many hours as I spent working on my studies, I spent twice that amount of time talking to you about my studies and bouncing ideas off you. Your mentorship throughout my entire doctoral program was vital to my success. Thank you.

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Section 1: Foundation of the Study and Literature Review

Introduction

As of 2019, healthcare expenditures in the United States grew by 4.6% to $3.8 trillion, $11,582 per capita, amounting to 17.7% of the Gross Domestic Product (GDP) (*National Health Expenditure Data | CMS*, n.d.). As of 2020, the United States healthcare spending increased 9.7% to approximately $4.1 trillion. (*National Health Expenditure Data | CMS*, n.d.) Even with this steep health care expenditure, the United States is falling behind the other countries' quality of care. (Freeman et al., 2020) As the largest health care payer in the United States, the Centers for Medicare and Medicaid Services (CMS) implemented a hospital value-based purchasing (VBP) program to improve the quality of care while reducing overall spending per beneficiary. (*NHE Fact Sheet | CMS*, n.d.) The United States spends a large portion of preventable hospital readmissions of the total expenditures. In 2018, 3.8 million preventable readmissions occurred within 30 days of discharge. These hospital readmissions cost the US healthcare system $15,200 per readmission. (*Overview of Clinical Conditions With Frequent and Costly Hospital Readmissions by Payer, 2018 #278*, n.d.)

CMS, through the VBP, created a program specifically to reduce avoidable hospital readmissions and decrease healthcare expenditures. The CMS program is named Hospital Readmission and Reduction Program (HRRP). The CMS policy for the HRRP program is "hospitals are encouraged to improve communication to engage patients and caregivers in discharge plan better, in turn, reduce avoidable readmissions." (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.) The HRRP program intends

to reduce unnecessary healthcare expenditures by reducing preventable hospital readmissions for specific patient diagnoses through a system that holds poor-performing hospitals accountable for high readmission rates. The HRRP program monitors the hospital readmission rates of six diagnoses and penalizes hospitals with high reimbursement scores. The six diagnoses tracked in the HRRP program are Acute Myocardial Infarction (AMI), Chronic Obstructive Pulmonary Disease (COPD), Heart Failure (HF), Pneumonia, Coronary Artery Bypass Graft (CABG), and Elective Primary Total Hip or Total Knee Arthroplasty (THA/TKA). (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.)

Of these six diagnoses, COPD is one of the top two costliest diagnoses in the HRRP program. COPD readmissions cost $5.3 billion annually and are the third leading cause of death globally. Between 2019 - 2020, 152,657 people died from COPD exacerbation in the United States. (*Underlying Cause of Death, 1999-2020 Results Form*, n.d.) Within the next 20 years, health experts estimate the number of COPD deaths to increase by over a million people per year. (Celli & Wedzicha, 2019) In addition to a high mortality rate, COPD is a leading cause of hospital readmissions, and the principal risk factor for a patient with COPD readmitted to the hospital after at least one hospitalization within the previous 12 months. (Njoku et al., 2020)

The cause or causes of preventable hospital readmissions is complex and doubtfully attributed to a single cause. (Jindal et al., 2018) The complex systems theory guides researchers in breaking down a complex system into its basic components. The

basic components are simple to comprehend by breaking down a complex system. (Wolfram, 1988) I analyzed a fundamental component of COPD hospital 30-day readmission rates using CAS. In this study, the basic component chosen was provider communication. Provider communication is the basic component because CMS instructs hospitals to reduce readmission rates through improved communication. (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.)

The complexity of COPD 30-day hospital readmission rates makes finding causation unfeasible. However, it is feasible to study if a correlation exists between provider communication and 30-day hospital COPD readmission rates. CMS has another program that measures provider communication. The hospital consumer assessment of healthcare providers and assessments (HCAHPS) program surveys patients following discharge and measures the patient's assessment of their interactions with healthcare providers within the hospital. (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.) The provider communication scores act as independent variables in the correlation analysis. The dependent variable was the Hospital Readmissions Reduction Program (HRRP) COPD 30-day readmission rate. (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.)

More than half of all hospitals continue to exceed the Chronic Obstructive Pulmonary Disease (COPD) 30-day readmission rate benchmark for their respective group. (CMS, 2021) Over the last ten years, 55% of hospitals have been penalized for hospital readmissions within 30-days of discharge. General Acute Care (GAC) hospitals

have underperformed the greatest of all. Over the same ten-year span, 93% of GAC hospitals have received early readmission penalties from the HRRP program. (Thompson et al., 2017)

In 2018, the annual number of early hospital readmissions was slightly under $3.8 billion. The average cost of early hospital readmission is $15,200, making the average annual cost of early hospital readmissions approximately $57 billion. (*Overview of Clinical Conditions With Frequent and Costly Hospital Readmissions by Payer, 2018 #278*, n.d.) The cost of early hospital readmissions is sizeable and an unnecessary burden to an already overburdened and costly healthcare system.

Problem Statement

The research problem is that 52.7% of hospitals fail to meet the COPD 30-day readmission rate benchmark. (CMS, 2021) The general healthcare problem is that preventable COPD 30-day hospital readmissions are not improving following the implementation of HRRP. More than half the hospitals in the HRRP program fail to achieve the mean excess readmission rate for patients with COPD. Over the last ten years, 55% of hospitals have been penalized for hospital readmissions within 30-days of discharge. Over the same ten-year span, 93% of General Acute Care (GAC) hospitals have received early readmission penalties from the HRRP program. (Thompson et al., 2017)

The significant gap in current practice-based research is the correlation between provider communication with 30-day COPD hospital readmission rates. Using SPSS, the

correlational study's outcome between provider communication and 30-day COPD hospital readmission rates did not find a positive correlation. A positive correlation would have shown both variable sets changing in the same direction. A negative correlation would have shown the variables changing in opposite directions. In the case of this study, the independent and dependent variables have zero correlation. (Bloomfield & Fisher, 2019) The ideal outcome of this study was to find a negative correlation between HRRP 30-day COPD excessive readmission ratio (ERR) and HCAHPS provider communication, where the ERR decreases as provider communication scores increase.

Purpose of the Study

Preventable COPD readmission rates negatively impact a hospital system short of hospital beds (Garmon, 2021) and cost the healthcare system $5.3 billion. (Celli & Wedzicha, 2019) This correlational-quantitative study examined the correlation between provider communication scores and preventable COPD 30-day readmission rates. The data for the independent variables came from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey results. The dependent variable data for 30-day Chronic Obstructive Pulmonary Disease (COPD) came from the Hospital Readmissions Reduction Program (HRRP). On the HRRP online portal, CMS states, "the Hospital Readmissions Reduction Program (HRRP) is a Medicare value-based purchasing program that encourages hospitals to improve communication to engage patients and caregivers in discharge plans better and, in turn, reduce avoidable readmissions." (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.) I

examined if a correlation exists between HCAHPS linear mean scores of Communication with Nurses, Communication with Doctors, and Communication about Medication with HRRP excess readmission ratio measures of patients with COPD.

In my attempt to examine if a correlation exists, the independent variables were HCAHPS linear measure scores of Communication with Nurses, Communication with Doctors, Communication about Medicines, and Care Transition. The dependent variable was the HRRP excess readmission ratio for COPD in Los Angeles, California hospitals. The target population was hospitals in Los Angeles County that also participated in the VBP program. Specifically, the criteria for this study were general acute care hospitals (GACH) in Los Angeles County. The inclusion criteria were participation in the HRRP with enough COPD discharges to calculate an excess readmission ratio. In addition, the GACH must also have participated in the HCHAPS program and have enough survey responses to generate all three-provider communication mean scores. The implications for positive quality improvements included the potential for healthcare leaders to initiate change to improve communication to reduce patient readmission rates while reducing the Medicare reimbursement rate penalties for their health service organization.

Research Questions and Hypotheses

This correlational-quantitative study examined the correlation between provider communication scores and preventable COPD 30-day readmission rates. Establishing a correlation for 30-day hospital readmissions was a complex process, even more so when analyzing multiple hospitals. Correlations were analyzed using the CAS theoretical

foundation to analyze essential components surrounding COPD 30-day hospital readmissions.

The research questions for the correlational-quantitative research study were as follows:

Research Question 1:

Does a negative relationship exist between nurse communication and preventable 30-day COPD readmission rates?

Research Question 2:

Does a negative relationship exist between doctor communication and preventable 30-day COPD readmission rates?

Research Question 3:

Does a negative relationship exist between communication about medications and preventable 30-day COPD readmission rates?

Null Hypothesis:

The null hypotheses were that nurse communication, doctor communication, and communication about medications do not have a statistically significant negative relationship with preventable 30-day COPD readmission rates.

Alternate Hypothesis:

The alternate hypotheses for these research questions were that nurse communication, doctor communication, and communications have a statistically significant negative relationship with preventable 30-day COPD readmission rates.

Theoretical Foundation for the Study

The HRRP program from CMS states that improved communication will decrease 30-day hospital ERR. (*Hospital Readmissions Reduction Program (HRRP)* | *CMS*, n.d.) CMS's most recent readmission outcomes show that more than half of all hospitals fail to achieve the expected readmission ratio. (CMS, 2021) The research hypothesis was that a correlation existed between one or more of the independent variables and the dependent variable. It is possible that CMS, as the creator of HRRP, found statistical significance in hospital readmission reduction when hospital providers sufficiently communicate with patients during their hospitalization. The expectation was that I would find a negative correlation between 30-day COPD readmission rates and provider communication scores.

The theoretical foundation for the study was the Complex Adaptive System (CAS) theory. CAS is a process of analyzing the basic components of a more extensive, more complex system. (Wolfram, n.d.) Analyzing the basic components of a complex system makes the information and system less complex to analyze. CAS is useful for examining the basic components of a complex system, such as the HRRP 30-day readmission and HCAHPS program.

The HRRP and HCAHPS programs are complex systems and, thus, difficult to analyze. Using the CAS theory, I reduced the HRRP datasets into individual hospital readmission ratios for 30-day COPD readmission rates. I then reduced the HCAHPS patient satisfaction scores into individual variables of nurse communication, doctor communication, communication about medications, and hospital 30-day COPD

readmission rates. Reducing these systems into basic components allowed me to analyze the correlations between provider coordination and COPD 30-day hospital readmission rates.

Nature of the Study

A correlational-quantitative methodology examined the correlation between provider communication and COPD 30-day hospital readmission rates. The justification for using the correlational methodology was that I attempted to determine the degree of correlation between the independent variables of provider communication from the HCAHPS database with 30-day COPD readmission rates from the HRRP database. I retrieved the independent variables of provider communication from the CMS HCAHPS database. I retrieved the dependent variable of COPD 30-day readmission rates. A correlational-quantitative type of research allowed me to perform a regression analysis with the independent variables of nurse communication, doctor communication, and communication about medications with the dependent variable of 30-day hospital readmission rates.

Literature Search Strategy

I conducted a literature search strategy using peer-reviewed scholarly articles from the following websites: Walden Library, EBSCO host database, Google Scholar, Hospital Readmission and Reduction Program (HRRP), Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), Centers for Medicare and Medicaid Services (CMS), Agency for Healthcare Research and Quality (AHRQ), PubMed, and

ProQuest. I used a Boolean search strategy for all data resources with phrases related to hospital readmission reduction, provider communication impact on hospital readmission, care, and readmission reduction for COPD.

The key search terms included Hospital Readmission Reduction Program, Hospital Readmission Reduction program of COPD, Impact of COPD readmissions on the healthcare system, Hospital Consumer Assessment of Healthcare Providers, Outcome of provider communication with patients, and Complex Adaptive System in Healthcare.

Literature Review Related to Key Variables and Concepts

The CMS HRRP program stance was that improved communication to better engage patients would reduce avoidable patient readmissions to the hospital. (*Hospital Readmissions Reduction Program (HRRP) | CMS*, n.d.) The maximum penalty for excessive readmission rates is three percent of reimbursement from the Inpatient Prospective Payment System. At the ten-year milestone following the HRRP implementation, CMS fined almost 2,500 hospitals, an average of 0.64%. Of the 2,500 hospitals fined for excessive readmission rates, only 39 hospitals received a maximum 3% penalty for having an excessive readmission rate. (Rau, 2021) One would assume that an average penalty rate below one percent shows wide-scale compliance with the HRRP program. However, retrospective studies reviewing hospital readmission rates before implementing the HRRP and after do not show a statistical decrease in hospital readmission rates. (Banerjee et al., 2021)

Of the 3,139 general acute care hospitals in the United States, 2,499 were penalized in the fiscal year 2021. (Rau, 2021) The results show that 640 hospitals received zero penalties from the HRRP program for excess readmissions. (Jordan Rau & 2021)Many hospitals were successful in not having an excess readmission ratio. The current literature on the HRRP program for COPD patients mainly focused on populations hardest hit by the program (McCarthy et al., 2019). It does not address solutions to correct the problem.

The CMS HRRP program stated instructions to reduce preventable readmissions on the program's home page. CMS instructs hospitals to improve communication to reduce preventable hospital readmissions. CMS did not reference the data they accessed to conclude that improved communication reduced unnecessary hospital readmissions. The data found in the Walden Library, Google Scholar, and other databases do not address communication as a process to reduce preventable hospital readmissions.

Testing the correlation between provider communication with 30-day hospital readmission ratios did not validate the introductory instructions of the HRRP program. It did not validate the guidance given to hospitals to prevent hospital readmissions.

Hospital Readmission Reduction Program: The Hospital Readmission Reduction Program (HRRP) began in the Federal Fiscal Year of 2013. Federal Fiscal Year begins October 1 and ends September 30. (*Budget of the US Government | USAGov*, n.d.) HRRP is part of the Centers for Medicare & Medicaid (CMS) value-based purchasing program that incentivizes hospitals to improve provider communication to

decrease avoidable hospital readmission rates. CMS incentivizes hospitals to reduce avoidable hospital readmissions within 30 days of discharge by linking hospital reimbursement to quality of care. (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.)

The linking of preventable readmission rates with quality of care occurred in 2001. The Agency for Healthcare Research and Quality (AHRQ) identified a population of patients with common comorbidities having a higher than usual readmission rate back into the hospital in less than 30 days following discharge. After further review, AHRQ concluded that readmissions are preventable. Per the AHRQ, the solution to prevent early hospital readmissions is by improving the quality of care provided to patients while they are in the hospital. (Brown et al., 2021)

Hospital Readmission Reduction Program of COPD: The Hospital Readmission Reduction Program (HRRP) began in the Federal Fiscal Year of 2013. The program started by tracking the diagnosis of Acute Myocardial Infarction (AMI), Heart Failure (HF), and Pneumonia. The initial readmission penalty for these three diseases was up to a one percent reimbursement penalty for Medicare patients. In 2015, CMS added COPD to the HRRP program as a preventable readmission diagnosis. (*Hospital Readmissions Reduction Program (HRRP) Archives | CMS*, n.d.) The year CMS added COPD to the HRRP program, the maximum readmission penalty was three percent of the diagnosis Medicare reimbursement penalty. (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.)

The HRRP reimbursement penalty uses a complex eight-step system to impose reimbursement penalties on hospitals. The first step in identifying the excess readmission penalty (ERRs) is dividing the predicted readmission rate by the hospital's expected readmission rate. The predicted readmission rate uses the hospital's observed case-mix and estimated effect on readmissions. The predicted readmission rate formula aids hospitals that treat a sicker population. The expected readmission rate is the number of COPD patients readmitted to an average hospital with a similar case mix. (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.)

Next, CMS stratifies hospitals into one of five peer groups. Next, CMS will identify the ERR within the five peer groups. Determining each hospital's ERR reduction penalty will only proceed if the hospital meets two criteria. The hospital must exceed the group's median ERR and have more than 25 eligible discharges. The calculation of a hospital's ERR is against that of peer hospitals within the same group. The calculation result will contribute to the CMS payment reduction or overpayment for hospitals lower than the ERR. The final reimbursement reduction applies to the base CMS fee for service (FFS) base operating diagnosis-related group (DRG) payments. (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.)

Impact of COPD readmissions on the healthcare system: In calendar 2018, the annual number of early hospital readmissions was slightly under 3.8 million. The average cost of early hospital readmission in the calendar year 2018 was $15,200, making the average annual cost of early hospital readmissions approximately $57 billion. (*Overview*

of Clinical Conditions With Frequent and Costly Hospital Readmissions by Payer, 2018 #278, n.d.) The cost of early hospital readmissions is sizeable and an unnecessary burden to an already overburdened and costly healthcare system. The cost of COPD in the healthcare system is growing from approximately $32 billion in 2010 to $49 billion in 2020. Currently, there is no cure for COPD, and the only way to manage the COPD population is to manage symptoms related to COPD. (Collinsworth et al., 2018) Slowing the growing cost of COPD will only come through the improved management of COPD-caused symptoms that lead to hospital readmission.

Hospital Consumer Assessment of Providers and Systems: The Hospital Consumer Assessment of Providers and Systems (HCAHPS) is a nationally standardized survey for patients following their hospital stay. The survey tool is a quality tool to measure the patient's perspective of their hospital stay following discharge. The results of the surveys allow CMS to accomplish three goals. First, CMS acquires standardized data important to consumers and reports the results. The patient experience data then allows patients to decide their future hospital stays based upon cumulative data of other consumer sentiments. Second, the public reporting of consumer satisfaction will incentivize hospitals to improve their patient experience. Last, transparency of patient experience increases accountability in health care. (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.)

Outcome of provider communication with patients: Patients need to know more about the symptoms of their medical conditions attributed to their disease processes

and effectively manage their medical conditions at home. Enhanced provider communication results in improved patient outcomes, a decrease in hospital readmissions, and a decrease in the cost of care. (Hong et al., 2020) Through enhanced communication, provider success in managing patients with chronic conditions occurs from improved education and teaching of disease management. The provider also collects more information from the patient during the enhanced communication that aids in disease management. (Som et al., 2017) Instrumental provider communication improves patients' health literacy by managing their disease process. Improving the patient's health literacy reduces their stress levels and decreases stress-induced exacerbations of their chronic conditions. (Noordman et al., 2020)

Complex Adaptive System in Healthcare: The theoretical foundation for the study is the Complex Adaptive System (CAS) theory. CAS is a process of analyzing the basic components of a more extensive, more complex system. (Wolfram, 1988) CAS applied in the healthcare setting has succeeded in problem-solving, adapting to changes in the healthcare landscape, and ongoing learning. Reviewing the functions of a hospital at the granular level allows the researcher to reduce the complexity of the hospital system and analyze the basic components, such as provider communication. (Martin, 2018)

Definitions

Chronic Obstructive Pulmonary Disease – chronic inflammation of the lung tissue, often involving the destruction of alveoli.

Communication about medications – independent variable - HCAHPS measures communication about medications by asking patients the following question, "When I left the hospital, I clearly understood the purpose for taking each of my medications." The patient's responses may range from Strongly disagree to agree Strongly. (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.)

Doctor communication – independent variable - HCAHPS measures doctor communication by asking, "During this hospital stay, how often did doctors explain things in a way you could understand?" The patient response options are Never, Sometimes, Usually, or Always. (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.)

Excessive Readmission Rate (ERR) – dependent variable - is the hospital's measure of performance for readmission rates. A hospital's ERR is a ratio of predicted readmission rates to a hospital. (*Hospital Readmissions Reduction Program (HRRP) | CMS*, n.d.)

Nurse communication – independent variable - HCAHPS measures nurse communication by asking, "During this hospital stay, how often did nurses explain things in a way you could understand?" The patient response options are Never, Sometimes, Usually, or Always. (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.)

Preventable 30-day COPD Readmission Rate – Unplanned readmission to the same hospital or another applicable hospital occurs within 30-days of discharge from the

initial admission. (*Hospital Readmissions Reduction Program (HRRP) Archives | CMS*, n.d.)

Assumptions

Within this study, the researcher made two assumptions. First, the data publicly reported on the CMS HRRP website is accurate and without errors. Second, the data publicly reported on the CMS HCAHPS website is accurate and without errors. These assumptions are necessary because the CMS HRRP and CMS HCHAPS are the primary sources of information, and there is no other location to retrieve the data.

Scope and Delimitations

Scope: This study aimed to test the correlation between provider communication and 30-day hospital COPD readmission rates in Los Angeles County, California. Using the CMS HRRP and HCAHPS data set for 2019, the researcher tested the CMS HCAHPS data of nurse communication, doctor communication, and medication communication with the CMS HRRP data of 30-day COPD readmission rate scores.

Delimitation: During this study, I did not include the other questions in the HCAHPS survey sent to patients following their discharge from the hospital setting. I did not include the other diagnosis tracked in the HRRP, such as Acute Myocardial Infarction, Heart Failure, Pneumonia, Coronary Artery Bypass Graft, and Elective Primary Total Hip or Knee Arthroplasty.

Significant, Summary, and Conclusions

The HRRP program has been in effect for nine years, and COPD has been in the program for seven years. Over that time, there has not been a significant decrease in the 30-day readmissions of patients suffering from COPD. (Banerjee et al., 2021) CMS instructs hospitals to improve patient communication during their stay to decrease preventable hospital readmission rates. The lack of success in decreasing preventable hospital readmissions for COPD patients over the last seven years shows a lack of successful strategy for most hospitals. Testing the relationship between provider communication and 30-day did not validate the stance of the HRRP program, which is to improve communication to decrease preventable hospital readmissions. Ultimately, the opposite was true, and hospitals must seek other processes or procedures to decrease preventable hospital readmissions. This study found no statistically significant correlation between provider communication and 30-day COPD readmission rates.

This study did not substantiate the claim that provider communication results in a decrease in preventable hospital readmissions and does not find the hospital reduction program's claim that communication is the key to changing the course for preventable hospital readmission rates. The opposite was true, and the quantitative analysis did not establish a statistically significant correlation between provider communication scores and hospital readmission rates. The result of this quantitative study contributes to the knowledge of preventing hospital readmissions for chronic conditions found in HRRP

because improving provider communication is not the correct process to prevent 30-day COPD readmission rates.

Since CMS began financially penalizing hospitals for excessive hospital readmission rates, over 93% of general acute care hospitals and 55% of all hospitals included in the HRRP have been financially penalized for excessive hospital readmission rates. Of the penalized hospitals, over 1,288 hospitals have been penalized every year since the start of the HRRP. (Rau, 2021) This study established that most hospitals continue to be noncompliant with reducing preventable hospital readmissions. What is unknown are the steps hospitals can take to prevent early hospital readmissions.

This study filled the gap of not establishing a statistical significance of communication in decreasing preventable hospital readmission rates for patients suffering from COPD. The result of the study does not bolster the strategy of provider communication as a strategy to decrease hospital readmission rates or invalidate the claim the strategy of communication decreases preventable hospital readmission rates.

Section 2: Research Design and Data Collection

Introduction

This correlational-quantitative study examined the correlation between provider communication scores and preventable 30-day COPD readmission rates. The data came from Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey results and 30-day hospital readmission rates of Chronic Obstructive Pulmonary Disease (COPD) patients found in the HRRP results. CMS states, "the Hospital Readmissions Reduction Program (HRRP) is a Medicare value-based purchasing program that encourages hospitals to improve communication to engage patients and caregivers in discharge plans better and, in turn, reduce avoidable readmissions." (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.) I attempted to examine the correlation between provider communication scores and COPD 30-day readmission rates.

In my attempt to examine if a correlation exists, the independent variables were HCAHPS linear measure scores of Communication with Nurses, Communication with Doctors, Communication about Medicines, and Care Transition. The dependent variable was the HRRP excess readmission ratio for COPD in Los Angeles, California hospitals. The target population was hospitals in Los Angeles County participating in the VBP program. Specific criteria include hospitals in Los Angeles County participating in the HRRP and HCAHPS programs for FY 2019. The implications for positive quality improvements included the potential for healthcare leaders to reduce patient readmission

rates through an improved communication system and reduce the Medicare reimbursement rate penalties for their respective health service organizations.

Research Design and Rationale

This quantitative study examined the relationship between the independent variable of Healthcare Provider Communication and the dependent variable of Preventable 30-Day COPD readmission Rates. The HRRP program placed hospitals in five groups of similar hospitals. The 30-day COPD hospital readmission rate is a ratio of predicted COPD readmissions and expected COPD readmissions within 30-days of discharge from the hospital. HRRP administrators then compared hospital readmission rates among the hospitals in the same group. The hospitals with a higher readmission ratio than the mean are penalized up to three percent, and hospitals under the readmission ratio mean received an overpayment.

This study's methodology of testing patient experience and hospital readmission rates is not new. The Cleveland Clinic has tested the association between readmission and patient experience in a total hip arthroplasty population. The study concluded a significant negative correlation between HCAHPS scores and hospital readmissions. (Levin et al., 2018) Another previous study established the impact of provider communication on hospitalization, and the results are that low provider communication scores increase hospitalizations. (Cronin et al., 2020)

The independent variables measured provider communication consisting of nurse communication, doctor communication, and communication about medications. The

source of the numeric values comes from the CMS HCAHPS database. The numeric value of each communication type came from surveys sent to patients following discharge from the hospital. The survey consisted of 29 questions regarding the patient's recent hospital stay. Of the 29 questions, 19 are core questions because they are critical to understanding the patient's stay in the hospital. HRRP classifies each provider communication question as a core metric of a patient's stay in the hospital. (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.)

The design of the research questions analyzed the correlation between provider communication from the HCAHPS database and COPD 30-day hospital readmission benchmark scores from the HRRP database. I tested the correlation of each hospital's provider communication scores using regression analysis. A statistically significant result was a p-value of less than 0.05, and one, two, or all three independent variables predicting the dependent variable of the 30-day COPD readmission score.

The first research question analyzed the correlation between nurse communication with patients. I tested the correlation between nurse communication scores and hospital COPD 30-day readmission rates using regression analysis. The design of the research questions was to analyze the correlation between different types of provider communication from the HCAHPS database and COPD 30-day hospital readmission benchmark scores from the HRRP database.

The second research question analyzed the correlation between doctor communication with patients. I tested the correlation between doctor communication

scores and hospital COPD 30-day readmission rates using regression analysis. The design of the research questions was to analyze the correlation between different types of provider communication from the HCAHPS database and COPD 30-day hospital readmission benchmark scores from the HRRP database.

The third research question analyzed the correlation between medication communication with patients. I tested the correlation between medication scores and hospital COPD 30-day readmission rates using regression analysis. The design of the research questions was to analyze the correlation between different types of provider communication from the HCAHPS database and COPD 30-day hospital readmission benchmark scores from the HRRP database.

A regression analysis builds mathematical models that predict one variable's value from another. (Wienclaw, 2021) This study aimed to understand provider communication's relationship with 30-day hospital COPD readmission rates. Performing a regression analysis with independent variables of nurse communication, doctor communication, and communication about medications with the dependent variable of 30-day COPD hospital readmission scores allowed me to analyze the correlation between provider communication and COPD hospital readmission rates. Suppose a statistically significant correlation existed between provider communication and COPD hospital readmission rates. In that case, hospital administrators should review their practices around providers communicating with patients because improving provider communication did not decrease the hospital's COPD readmission rates. However, that

was not the case in this study. I did not find a statistically significant relationship between the independent variables of nurse communication, doctor communication, and communication about medications with the dependent variable of 30-day COPD ERR was not found.

Population

Los Angeles County is one of the largest counties and has the largest population in the United States. The county is 4,084 square miles and is home to approximately ten million residents. ("About LA County," 2016) (*U.S. Census Bureau QuickFacts*, n.d.) California has 524 general acute care hospitals (GACH), of which 74 are in Los Angeles County. Of the 74 GACHs, 59 hospitals participate in HRRP and HCAHPS. The target population was all 59 GACHs in Los Angeles County participating in the HRRP and HCAHPS programs. (*Facilities Archive*, n.d.)

The provider communication scores came from the publicly reported HCAHPS website. The HCAHPS database presented the consumer satisfaction scores for the mean, standard deviation, and percentiles. The percentiles are 5^{th}, 10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th}, and 95^{th}. (*Summary Analyses*, n.d.) The regression analysis used the mean score for communication with nurses, communication with doctors, and communication about medications.

The 30-day COPD hospital readmission scores came from the publicly reported data on the HRRP website. HRRP presents the 30-day COPD scores as a percentage of reimbursement the hospital should expect. Hospitals with the worst median ERR for their

respective group received a score of 0.97, and the best-performing hospitals received a score greater than 1.0. A score of 0.97 is the payment adjustment factor and equates to a 97% reimbursement because the hospital incurred a 3% reimbursement penalty. (*Hospital Readmissions Reduction Program (HRRP)* | *CMS*, n.d.)

Sampling and Sampling Procedure

The HRRP program did not display a dataset for Los Angeles County. The HRRP data set displayed datasets at the state level for hospital excessive readmission rates of hospital readmission rates for acute myocardial infarction (AMI), heart failure (H.F.), pneumonia, total hip/knee arthroplasty, and chronic obstructive pulmonary disease (COPD). The HRRP data allows for filtering the data by state and measure name. The data set abstracted from the HRRP publicly reported data allows for filtering by the state of California and the measure name of "READM-30-COPD-HRRP." After filtering datasets, each dataset was transferred to a Microsoft Excel spreadsheet and aligned with the HCAHPS datasets. (*Hospital Readmissions Reduction Program* | *Provider Data Catalog*, n.d.)

Next, I accessed the CMS Hospital General Information page for hospital I.D. numbers. The general information page is a list of all hospitals registered with Medicare. The list allowed me to filter hospitals by general acute care and county. (*Hospital General Information* | *Provider Data Catalog*, n.d.) For the intent of this research, the dataset is GACHs in Los Angeles County. The general information page allowed me to filter the hospital types and suppress non-GACH hospitals. The filter allowed me to

suppress hospitals outside of Los Angeles County. I transferred the final dataset to the same Microsoft Excel spreadsheet as the HRRP dataset. Using the VLOOKUP function in Microsoft Excel, the HRRP data was compared to the general hospital information using the general facility identification (I.D.) number of GACHs in Los Angeles County sourced from the general information dataset. I utilized the VLOOKUP function in the free column next to the HRRP data set. The VLOOKUP function compared each facility's I.D. number with those in the general information dataset. The hospitals in the HRRP dataset did not have a matching facility I.D. number as the empty field next to the hospital was populated with an "#N/A." The hospitals in the HRRP dataset that matched the Los Angeles County GACH hospital general information dataset resulted in a matching hospital I.D. number in the empty field next to the correlating hospital. The hospitals with a result of #N/A were removed from the dataset, leaving only Los Angeles County HRRP dataset with 59 general acute care hospitals with their corresponding HRRP data.

The population of this research was general acute care hospitals (GACH) in Los Angeles County. This research sampled Los Angeles County hospitals participating in HRRP and HCAHPS programs. Of the 74 hospitals in Los Angeles County, 15 did not participate in the FY 2019 HRRP or HCAHPS programs because these hospitals had too few COPD readmissions to report or not enough HCAHPS responses to calculate a score. The data for hospitals with too few hospital readmissions to report had specific information displayed in the column titled "number of readmissions." When a hospital

had too few readmissions to report, HRRP did not calculate an ERR for the hospital and reported N/A instead of a numeric value. Because these hospitals did not have data, they were excluded from the research, leaving 59 hospitals to analyze. The matching hospitals on the HCAHPS dataset also had to be removed and not included in this study.

The HCAHPS data of nurse communication, doctor communication, and communication about medications was retrieved from the CMS publicly reported HCAHPS website. The FY 2019 HCAHPS dataset is displayed at the national, state, and individual hospital levels. The data for this study was in the "2020 Annual files" heading. The file contained four 2020 annual files. The file utilized for this study was the file name "*pdc_s3_hos_data_dgck_sfyz*." The file contained all HCAHPS questions and responses for hospitals in the United States. For this study, the data was filtered down to hospitals in Los Angeles County and linear mean scores of nurse communication, doctor communication, and communication about medications.

Using Microsoft Excel, the HCAHPS spreadsheet for Los Angeles County hospitals was sorted by hospital I.D. number to find the matching hospitals from the CMS HRRP spreadsheet. HCAHPS linear mean scores of nurse communication, doctor communication, and communication about medications for the same Los Angeles County hospitals were placed next to the correlating hospitals from the HRRP datasets.

Instrumentation and Operationalization of Constructs

HRRP and HCAHPS publish hospital readmission rates for all participating hospitals online. The year accessed for this research was FY 2019. FY 2019 was accessed

instead of later years to avoid any effect the COVID-19 pandemic may have on hospital readmissions for patients suffering from COPD or patients' perception of their care during the drastic change to hospital operations that impacted all GACHs in Los Angeles County.

Through CMS, the United States government publicly published the data of participating hospitals online. Works of the United States government do not require permission to use and publicly reported data may be freely acquired. (*About Using Government Data | Provider Data Catalog*, n.d.)

The HCAHPS survey score required a sample size larger than the HCAHPS criteria of 300 complete samples in 12 months. (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.-b) Critics of the CMS methodology believe that the qualitative data required a larger sample size than 300 complete samples to achieve a valid survey result. After analyzing all hospitals receiving less than 500 complete samples and recalculating the HCAHPS results in terciles, quartiles, and deciles, the outcome results were the same as initially calculated by CMS. After further testing and retesting, the CMS scoring methodology for calculating HCAHPS scores is statistically significant and reproducible. (Glance et al., 2021)

Operationalization

Hospital Readmissions Reduction Program: A Centers of Medicare & Medicaid value-based purchasing program encouraging hospitals to improve communication and care coordination to reduce hospital readmissions. CMS holds hospitals accountable for

excess readmissions through financial awards for superior performance or financial penalties for poor performance. Hospitals with low readmission rates receive above-average reimbursements, and hospitals with high readmission rates receive up to a 3% reimbursement penalty. (*Hospital Readmissions Reduction Program (HRRP) | CMS*, n.d.)

Excess Readmission Ratio (ERR): The ERR ratio predicted readmissions to expected readmissions. HRRP uses the ratio to compare the mean score of other hospitals in the same group. Hospitals with an ERR greater than the group mean are financially penalized. (*Hospital Readmissions Reduction Program (HRRP) Measures*, n.d.)

Predicted Readmission Rate: The predicted 30-day COPD readmission rate for an average hospital based on case-mix performance. (*Hospital Readmissions Reduction Program (HRRP) Measures*, n.d.)

Expected Readmission Rate: A hospital expected 30-day COPD readmission rate is the average hospital's readmission rate with a similar patient case mix. (*Hospital Readmissions Reduction Program (HRRP) Measures*, n.d.)

Case Mix: A hospital-specific effect on readmissions compared to the average hospital. (*Hospital Readmissions Reduction Program (HRRP) Measures*, n.d.)

Hospital Consumer Assessment of Healthcare Providers and Systems: A national standardized survey of patients' perspectives of their care while admitted into a hospital. Survey scores are presented in several ways: star scores, top box, middle box, bottom box, and linear mean scores. (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.-b)

Linear Mean Scores: The total score of patient responses is based upon weighted patient responses. An answer of "Never" equals 1, "Sometimes" equals 2, "Usually" equals 3, and "Always" equals 4. Each survey totals a cumulative score. (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.-b) A maximum score for each independent variable is 12 points for nurse communication and doctor communication. The maximum score for communication about medications is 8 points.

Nurse Communication: Three questions on the HCAHPS survey, then a linear mean score is produced from the three responses. (*Survey of Patients' Experiences (HCAHPS) | Provider Data Catalog*, n.d.) The three questions asked of patients regarding their nursing communication are as follows: "During this hospital stay, how often did nurses treat you with courtesy and respect?" "During this hospital stay, how often did nurses listen carefully to you?" "During this hospital stay, how often did nurses explain things in a way you could understand?" The available response is as follows: "Never," "Sometimes," "Usually," or "Always." (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.)

Doctor Communication: Three questions on the HCAHPS survey about doctor communication, then a linear mean score is produced from the three responses. (*Survey of Patients' Experiences (HCAHPS) | Provider Data Catalog*, n.d.) The three questions asked of patients regarding their doctor communication are as follows: "During this hospital stay, how often did doctors treat you with courtesy and respect?" "During this hospital stay, how often did doctors listen carefully to you?" "During this hospital stay,

how often did doctors explain things in a way you could understand?" The available response is as follows: "Never," "Sometimes," "Usually," or "Always." (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.)

Communication about medications: Two questions on the HCAHPS survey are regarding communication about medications. (*Survey of Patients' Experiences (HCAHPS) | Provider Data Catalog*, n.d.) The questions on the HCAHPS survey regarding communication about medications are as follows: "Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?" "Before giving you any new medicine, how often did the hospital staff describe possible side effects in a way you could understand?" The available response is as follows: "Never," "Sometimes," "Usually," or "Always." (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.)

Data Analysis Plan

The IBM Statistical Package for the Social Sciences (SPSS) software was used to perform the regression analysis. (*SPSS Statistics - Features*, 2022) SPSS is a software program that offers statistical programs for forecasting, data preparation and management, and correlation regression analysis. SPSS allows a user to predict categorical outcomes and apply correlation regression analysis. (*SPSS Statistics - Overview*, 2021)

The HRRP did not display a dataset for GACHs in Los Angeles County. The HRRP data set displayed the hospital's excessive readmission rates of hospital

readmission rates for acute myocardial infarction (AMI), heart failure (H.F.), pneumonia, total hip/knee arthroplasty, and chronic obstructive pulmonary disease (COPD). The data sets are displayed at the state level. The HRRP data allowed for filtering the data by state and measure name. The data set abstracted from the HRRP publicly reported data allowed for filtering by the state and the measure name of "READM-30-COPD-HRRP." After filtering datasets, each dataset was transferred to a Microsoft Excel spreadsheet. (*Hospital Readmissions Reduction Program | Provider Data Catalog*, n.d.)

Next, the CMS Hospital General Information page was accessed to find GACHs in Los Angeles County and to acquire the unique facility I.D. number. The general information page is a list of all hospitals registered with Medicare. The list allows for filtering hospitals by general acute care and county. (*Hospital General Information | Provider Data Catalog*, n.d.) For the intent of this research, the filtering of hospital information occurred by type (general acute care) and county (Los Angeles). The dataset was then transferred to the filtered HRRP dataset on a separate tab. I then used the VLOOKUP function in Microsoft Excel, and the HRRP data was compared to the general hospital information using the facility identification (I.D.) number. Hospitals in the HRRP dataset that did not have a matching facility I.D. resulted in an #N/A. The hospitals in the HRRP dataset that matched the filtered hospital general information dataset were validated by resulting with the exact facility I.D. number. The hospitals that had a result of #N/A were removed from the dataset, leaving only a Los Angeles County HRRP dataset with 59 general acute care hospitals with their corresponding HRRP data.

The population of this research was general acute care hospitals (GACH) in Los Angeles County. This research sampled Los Angeles County hospitals participating in HRRP and HCAHPS programs. Of the 74 hospitals in Los Angeles County, 13 did not participate in the HRRP program because these hospitals had too few COPD readmissions to report. The data for hospitals with too few hospital readmissions to report had specific information displayed in the column titled "number of readmissions," which was N/A instead of a numeric value. Because these hospitals did not have data, they were excluded from the research, leaving 59 hospitals that were analyzed. The matching hospitals on the HCAHPS dataset were also removed and not included in this study.

The HCAHPS data of nurse communication, doctor communication, and communication about medications was retrieved from the CMS publicly reported HCAHPS website. The 2019 HCAHPS dataset is displayed at the national, state, and individual hospital levels. The data for this study was found in the "2020 Annual files" heading. The file contains four HCAHPS files. The file utilized for this study was the file name "pdc_s3_hos_data_dgck_sfyz." The file contained all HCAHPS questions and responses for hospitals in the United States. For this study, the data was filtered to hospitals in Los Angeles County and linear mean scores of nurse communication, doctor communication, and communication about medications.

Using the VLOOKUP function in Microsoft Excel, the HCAHPS spreadsheet for Los Angeles County hospitals was filtered to find the matching hospitals from the CMS HRRP spreadsheet. HCAHPS linear mean scores of nurse communication, doctor

communication, and communication about medications for the same Los Angeles County hospitals are on the final HRRP spreadsheet.

Research Questions:

Research Question 1:

Does a negative relationship exist between nurse communication and 30-day COPD readmission rates?

Research Question 2:

Does a negative relationship exist between doctor communication and 30-day COPD readmission rates?

Research Question 3:

Does a negative relationship exist between communication about medications and 30-day COPD readmission rates?

Performing multiple regression analysis examined how multiple independent variables are related to one dependent variable. The model created a correlation over a straight line using an equation to describe the independent and dependent variables. The equation used to perform a multiple regression analysis is: "$y=\theta 0+\theta 1x1+\theta 2x2+\cdots+\theta nxn$" (Kinaneva et al., 2021)

The independent variable of nurse communication, doctor communication, and communication about medications were because CMS HRRP policy encourages hospitals to improve communication to reduce patient readmission rates. (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.)

Threats to Validity

Sampling bias is a threat to validity and may impair the external validity of this study because the data sets chosen for the study are for logistical reasons. (Chen et al., 2021) This correlational-quantitative research used two different secondary datasets from CMS. I chose these datasets because they are the most relevant for the study, and the study tested a CMS policy on hospital readmission rates. CMS encourages hospitals to improve communication with patients to decrease hospital readmissions. The logical dataset for the dependent variable is the CMS HRRP dataset, which measures excess readmission ratios. The logical data sets for the independent variables are the CMS HCAHPS dataset that quantifies patient satisfaction with provider communication while admitted to the hospital from COPD.

A patient's outcome with the hospital was a threat to the internal validity of this study, specifically speaking to the independent variable data from HCAHPS. Patient outcomes may affect the overall perception of the patient's overall hospitalization. (Flannelly et al., 2018) Patient outcomes were a possible threat to validity if the patient was discharged from the hospital with a bad outcome and retaliated against the hospital by grading all questions poorly. Fortunately, this threat to internal validity did not impact this study because the HCAHPS program monitors patient responses and other factors that do not reflect hospital performance. HCAHPS administrators adjust factors to eliminate any advantage or disadvantage in scores that might result from patient

outcomes beyond a hospital's control. (*HCAHPS: Patients' Perspectives of Care Survey | CMS*, n.d.)

Ethical Procedures

The data for this study was the second source, publicly reported data from CMS. The CMS data was available at no cost and accessible to the public. Because the datasets are the second source, no human participants participated in this study. Permission was not required to use the HRRP or HCAHPS dataset because they are publicly reported data sets from the United States government. The United States government did not require authorization to access or use publicly reported data in this study. (*About Using Government Data | Provider Data Catalog*, n.d.)

The raw data were analyzed during this study, and no data manipulation occurred before or after the analysis. The only exclusion criteria of hospitals within the defined population were those hospitals without datasets for FY 2019 on either the HRRP or HCAHPS websites. Following the conclusion of this study, the datasets remain on my password-protected computer so that no other individual has access to the data. There were no ethical issues with this study.

Summary

I examined the correlation between provider communication scores and preventable COPD 30-day readmission rates in this research. The population studied was general acute care hospitals participating in both HRRP and the HCAHPS program, which have data to study for 2019. Understanding the correlation between provider

communication and 30-day hospital readmission rates helps support future research on potentially finding the causation of excess 30-day COPD readmission rates.

Studying the correlation between hospital readmissions and patient perceptions of care is a well-studied healthcare phenomenon. (Levin et al., 2018) (Cronin et al., 2020) Patient perspectives of their care during hospitalization correlate to patient outcomes. The correlation study of 30-day COPD excess readmission rates and provider communication scores does not exist. This study attempted to fill the literature gap by studying the correlation between COPD patients' perception of their care and the likelihood the patient readmit to the hospital within 30-days of discharge.

Because this research aimed to study the relationship between the dependent variable of 30-day hospital excess readmission rates of COPD and the independent variables of provider communication scores, a correlation regression analysis was used to test the correlation between the dependent and independent variables. (Aggarwal & Ranganathan, 2017) I retrieved both data sets from publicly reported websites from HRRP and HCAHPS. The population of the datasets was GACHs in Los Angeles County. The only exclusion criteria are those hospitals that did not have publicly reported data in either the HRRP or HCAHPS database for FY 2019.

Section 3: Presentation of the Results and Findings

Introduction

This correlational-quantitative study examined the correlation between provider communication scores and preventable COPD 30-day readmission rates. A linear regression analysis was used for the statistical analysis. The following research questions were examined during this study:

The research questions for the correlational-quantitative research study were as follows:

Research Question 1:

Does a negative relationship exist between nurse communication and preventable 30-day COPD readmission rates?

Research Question 2:

Does a negative relationship exist between doctor communication and preventable 30-day COPD readmission rates?

Research Question 3:

Does a negative relationship exist between communication about medications and preventable 30-day COPD readmission rates?

The null hypotheses were that nurse communication, doctor communication, and communication about medications do not have a statistically significant negative relationship with preventable 30-day COPD readmission rates. The findings of this study are included in this chapter. First, I present the frequency of the variables used in the

study. Next, I present the results of the analyses for each of the three research questions. Finally, the summary of the results from the regression analysis is included at the end of the section.

Data Collection of Secondary Data Set

The population of this research was general acute care hospitals (GACH) in Los Angeles County. This research sampled general acute care hospitals located in Los Angeles County. The year accessed for all data bases in this research was FY 2019. California has 524 general acute care hospitals (GACH), of which 74 are in Los Angeles County. (*Facilities Archive,* n.d.) Of the 74 GACHs, 59 hospitals participate in both HRRP and HCAHPS. The target population was all 59 GACHs in Los Angeles County participating in the HRRP and HCAHPS programs.

The provider communication scores came from the publicly reported HCAHPS website. The HCAHPS database presents the consumer satisfaction scores for the mean, standard deviation, and percentiles. The percentiles are 5^{th}, 10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th}, and 95^{th}. (*Summary Analyses*, n.d.) The regression analysis used the mean scores for communication with nurses, communication with doctors, and communication about medications.

The 30-day COPD hospital readmission scores came from the publicly reported data on the HRRP website. HRRP presents the 30-day COPD scores as a percentage of reimbursement the hospital should expect. Hospitals with the worst median ERR for their respective group received a score of 0.97, and the best-performing hospitals received a

score greater than 1.0. A score of 0.97 is the payment adjustment factor and equates to a 97% reimbursement because the hospital incurred a 3% reimbursement penalty. (*Hospital Readmissions Reduction Program (HRRP)* | *CMS*, n.d.)

The data sources utilized in the data collection were the Centers for Medicare and Medicaid Services for the general acute care hospital population. The preventable 30-day COPD excessive readmission ratio-dependent variable was retrieved from the Hospital Readmissions Reduction program portal. The independent variables of nurse communication, doctor communication, and communication about medication were retrieved from the Hospital Consumer Assessment of Healthcare Providers and Systems portal.

The secondary data sets contained two data discrepancies. The first discrepancy was that the HRRP and HCAHPS data sets contained incomplete and missing data from hospitals that did not participate or submit their scores for FY 2019. For example, data sets for HRRP or HCAHPS were present for FY 2018 and FY 2020, but no data was present for FY 2019. The second discrepancy found is that the HRRP and HCAHPS programs only collect data on general acute care hospitals and exclude psychiatric, rehabilitation, long-term care, children's, critical access, and Prospective Payment System (PPS)-exempt cancer hospitals. (*Hospital Value-Based Purchasing (HVBP) Program Participation*, n.d.) The data collected was enough to answer each research question and provide an analysis of the relationship between preventable 30-day COPD readmission rates and provider communication.

The only exclusion criteria of hospitals within the defined population are those without datasets for FY 2019 on either the HRRP or HCAHPS websites. Los Angeles County has 74 GACHs within county limits. This study utilized 59 hospitals, representing 79.7 percent of the total population.

Results

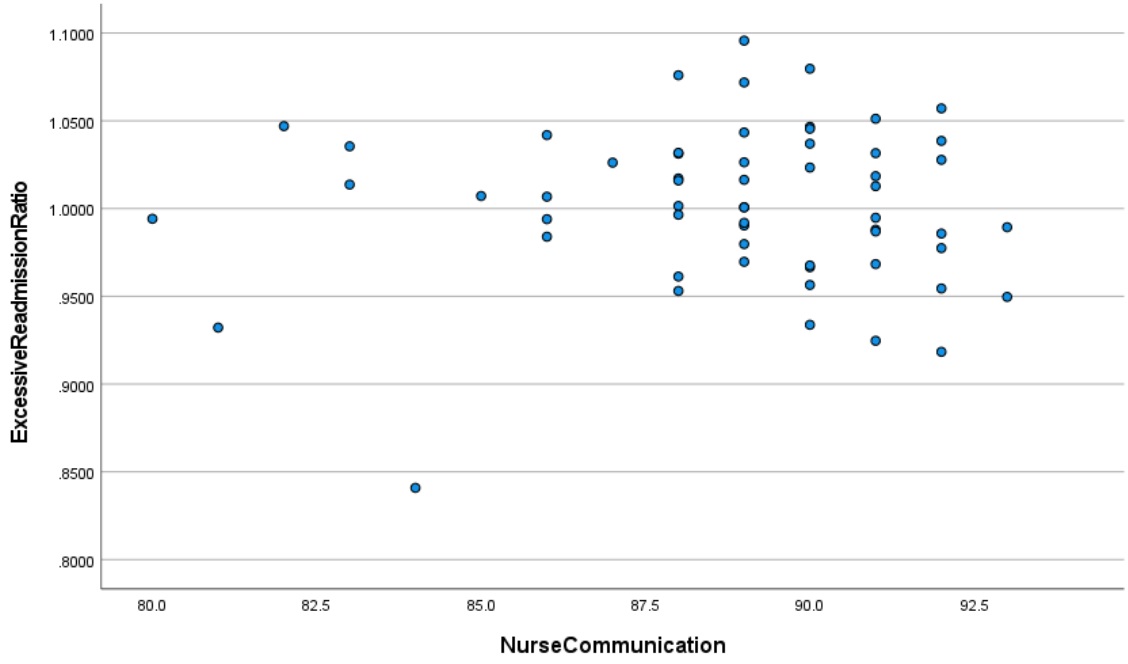
Table 1

Results for the Linear Regression Analysis of Nurse Communication and Excessive Readmission Rate

Variable	*B*	95% CI	R^2	*F*
Nurse Communication	.000*	[-.004,.004]	.001	.037*

* Not significant at the .849 level of significance ($p > .05$)

Figure 1



Research Question 1:

Does a negative relationship exist between nurse communication and preventable 30-day COPD readmission rates?

A linear regression analysis was conducted to evaluate the relationship between ERR and Nurse Communication. The simple linear regression analysis results did not reveal a statistically significant association between Nurse Communication and ERR (*p* 0.849). The regression coefficient: *B* = .000, 95% C.I. [-.004, .004] associated with Nurse Communication suggests that with each additional percentile, the ERR increases by 0. The R^2 value of 0.001 associated with this regression model suggests that the percentile of Nurse Communication accounts for .1% of the variation in ERR, which means that 99.9% of the variation in ERR cannot be explained by Nurse Communication alone. The confidence interval associated with the regression analysis does contain 0, which means the null hypothesis, *nurse communication does not have a statistically significant negative relationship with preventable 30-day COPD readmission rates*, can be accepted. (see Table 1)

The scatterplot performed with the dependent variable of Excessive Readmission Ratio on the Y axis, and Nurse Communication on the X axis supports the regression analysis and shows no relationship between Excessive Readmission Ratio and Nurse Communication. (See Figure 1)

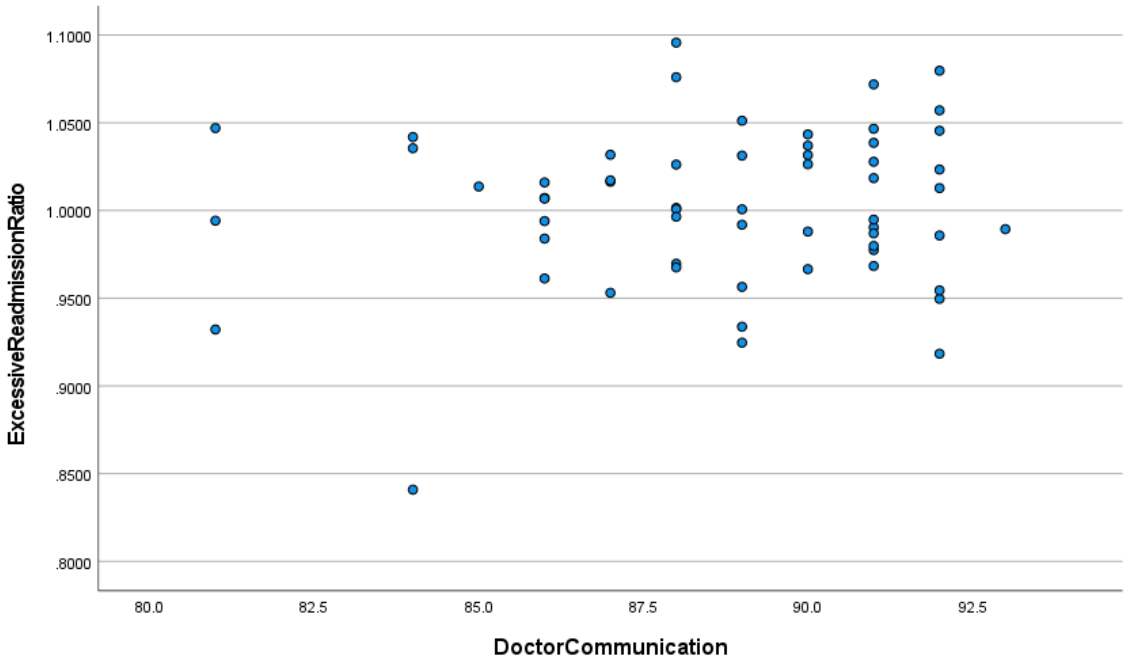
Table 2

Results for the Linear Regression Analysis of Doctor Communication and Excessive Readmission Rate

Variable	*B*	95% CI	R^2	*F*
Doctor Communication	.002*	[-.002,.006]	.013	.730*

* Not significant at the .396 level of significance ($p > .05$)

Figure 2



Research Question 2:

Does a negative relationship exist between doctor communication and preventable 30-day COPD readmission rates?

A linear regression analysis was conducted to evaluate the relationship between Doctor Communication and ERR. The simple linear regression analysis results did not reveal a statistically significant association between the ERR and Doctor Communication (*p* 0.396). The regression coefficient: *B* = .002, 95% C.I. [-.002, .006] associated with Doctor Communication suggests that with each additional percentile, the ERR increases by .002. The R^2 value of 0.013 associated with this regression model suggests that the percentile of Doctor Communication accounts for .13% of the variation in ERR, which means that 99.87% of the variation in ERR cannot be explained by Doctor Communication alone. The confidence interval associated with the regression analysis contains 0, which means the null hypothesis that doctor communication does not have a statistically significant negative relationship with preventable 30-day COPD readmission rates can be accepted. (see Table 2)

The scatterplot performed with the dependent variable of Excessive Readmission Ratio on the Y axis and Doctor Communication on the X axis supports the regression analysis and shows no relationship between Excessive Readmission Ratio and Doctor Communication. (See Figure 2)

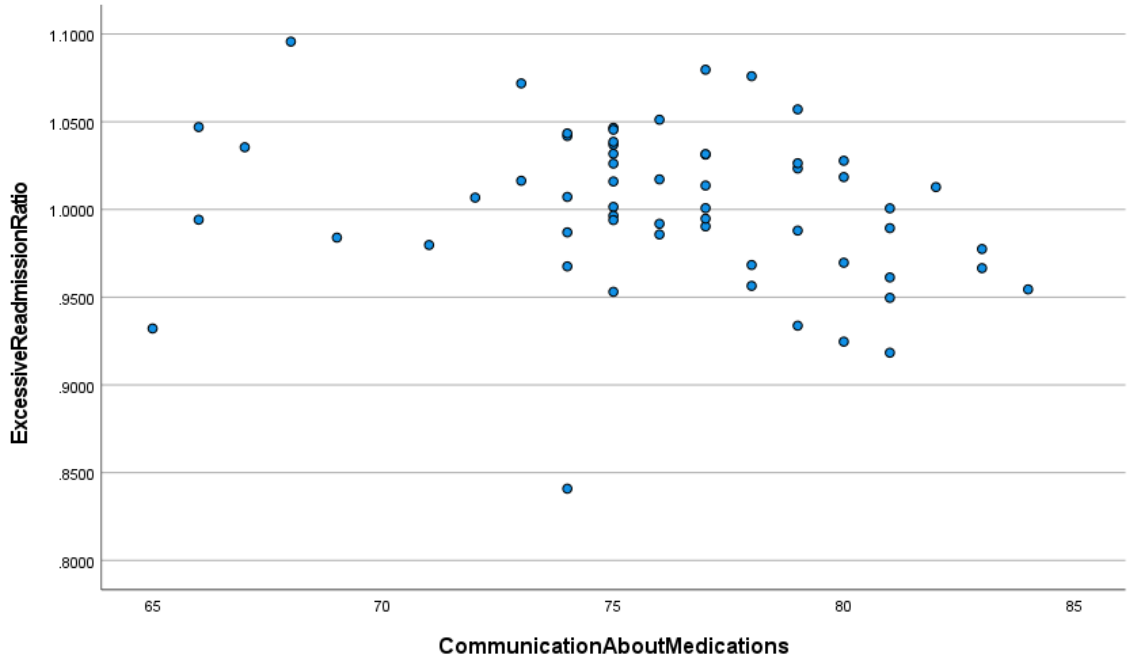
Table 3

Results for the Linear Regression Analysis of Communication about Medications and Excessive Readmission Rate

Variable	*B*	95% CI	R^2	*F*
Communication about Medications	-.002*	[-.005,.000]	.046	2.764*

* Not significant at the .102 level of significance ($p > .05$)

Figure 3



Research Question 3:

Does a negative relationship exist between communication about medications and preventable 30-day COPD readmission rates?

A linear regression analysis was conducted to evaluate the relationship between Communication about Medications and ERR. The simple linear regression analysis results did not reveal a statistically significant association between the ERR and Communication about Medications (*p* 0.102). The regression coefficient: *B* = -.002, 95% C.I. [-.005, .000] associated with the Communication about Medications suggests that with each additional percentile, the ERR decreases by .002. The R^2 value of 0.046 associated with this regression model suggests that the percentile of Communication about Medications accounts for 4.6% of the variation in ERR, which means that 96.4% of

the variation in ERR cannot be explained by Communication about Medications alone. The confidence interval associated with the regression analysis does contain 0, which means the null hypothesis, *Communication about Medications does not have a statistically significant negative relationship with preventable 30-day COPD readmission rates*, can be accepted. (see Table 3)

The scatterplot with the dependent variable of Excessive Readmission Ratio on the Y axis and Communication about Medications on the X axis supports the regression analysis. It shows no relationship between Excessive Readmission Ratio and Communication about Medications. (See Figure 3)

Summary

A linear regression analysis was conducted to evaluate the relationship between ERR and Nurse Communication, Doctor Communication, and Communication about Medication. The simple linear regression analysis results did not reveal a statistically significant association between Nurse Communication, Doctor Communication, and Communication about Medications and ERR. The regression coefficients associated with Nurse Communication, Doctor Communication, and Communication about Medications suggest that with each additional percentile, the ERR increases by .000 - .002 or decreases by .002. The R^2 values of the independent variable ranged from .1 percent to .46 percent showing little impact as potential predictor variables. All three independent variables had no statistically significant relationship with the dependent variable. Scatterplots were completed for each of the independent variables and the dependent

variable. The scatter plot for each independent and dependent variable showed the same outcome. There is no relationship between any of the independent variables and the dependent variable. The null hypothesis for the research questions "*does a negative relationship exist between nurse communication and preventable 30-day COPD readmission rates?," "does a negative relationship exist between doctor communication and preventable 30-day COPD readmission rates?," and "does a negative relationship exist between communication about medications and preventable 30-day COPD readmission rates?"* is accepted.

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

Introduction

Preventable COPD readmission rates negatively impact a hospital system short of hospital beds (Garmon, 2021) and cost the healthcare system $5.3 billion. (Celli & Wedzicha, 2019) This correlational-quantitative study examined the correlation between provider communication scores and preventable COPD 30-day readmission rates. The data for the independent variables came from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey results. The dependent variable data for 30-day Chronic Obstructive Pulmonary Disease (COPD) came from the Hospital Readmissions Reduction Program (HRRP). On the HRRP online portal, CMS states, "the Hospital Readmissions Reduction Program (HRRP) is a Medicare value-based purchasing program that encourages hospitals to improve communication to engage patients and caregivers in discharge plans better and, in turn, reduce avoidable readmissions." (*Hospital Readmissions Reduction Program (HRRP) Overview*, n.d.) I examined if a correlation exists between HCAHPS linear mean scores of Communication with Nurses, Communication with Doctors, and Communication about Medication with HRRP excess readmission ratio measures of patients with COPD.

In my attempt to examine if a correlation exists, the independent variables were HCAHPS linear measure scores of Communication with Nurses, Communication with Doctors, Communication about Medicines, and Care Transition. The justification for using the correlational methodology is that I am attempting to determine the degree of a

correlation between the independent variables of provider communication from the HCAHPS database with 30-day COPD readmission rates from the HRRP database. I retrieved provider communication and cared independent coordination variables from the CMS HCAHPS database. I retrieved the dependent variable of COPD 30-day readmission rates. A correlational-quantitative type of research allows me to perform a regression analysis with the independent variables of nurse communication, doctor communication, and communication about medications with the dependent variable of 30-day hospital readmission rates.

All three independent variables had no statistically significant relationship with the dependent variable. Scatterplots were completed for each of the independent variables and the dependent variable. The scatter plot for each independent and dependent variable showed the same outcome. There is no relationship between any of the independent variables and the dependent variable. The null hypothesis for "*does a negative relationship exist between nurse communication and preventable 30-day COPD readmission rates?," "does a negative relationship exist between doctor communication and preventable 30-day COPD readmission rates?," and "does a negative relationship exist between communication about medications and preventable 30-day COPD readmission rates?"* is accepted.

Interpretation of the Findings

The results confirmed the null hypothesis for the three research questions "*does a negative relationship exist between nurse communication and preventable 30-day COPD*

readmission rates?" "does a negative relationship exist between doctor communication and preventable 30-day COPD readmission rates?" and "does a negative relationship exist between communication about medications and preventable 30-day COPD readmission rates?."

The regression coefficient associated with Nurse Communication, Doctor Communication, and Communication about Medications suggests that with each additional percentile, the ERR increases by .000 - .002 or decreases by .002. The R^2 values of the independent variable ranged from .1 percent to .46 percent showing little impact as potential predictor variables. All three independent variables had no statistically significant relationship with the dependent variable. Scatterplots were completed for each of the independent variables and the dependent variable. The scatter plot for each independent variable and dependent variable showed the same outcome. There is no relationship between any of the independent variables and the dependent variable.

The results of this study do not confirm that provider communication reduces 30-day hospital readmissions as published on the HRRP website. No peer-reviewed literature has attempted to correlate or analyze the relationship between provider communication and 30-day COPD readmission rates, as stated on the HRRP website. (*Hospital Readmissions Reduction Program (HRRP) | CMS*, n.d.) However, preventable 30-day COPD readmission continues to plague the United States health system and impact the

lives of those patients unable to manage their chronic condition outside the hospital setting. (Thompson et al., 2017)

The theoretical foundation for the study was the Complex Adaptive System (CAS) theory. CAS is a process of analyzing the basic components of a more extensive, more complex system. (Wolfram, n.d.) Analyzing the basic components of a complex system makes the information and system less complex to analyze. CAS is useful for examining the basic components of a complex system, such as the HRRP 30-day readmission and HCAHPS program. The basic components studied were the independent variables of HCAHPS scores for nurse communication, doctor communication, and communication about medications. After utilizing the CAS theory, the basic components of provider communication and 30-day COPD readmission rates were analyzed as opposed to the entirety of both programs. The CAS system helped make the analysis of the programs easier to manage and perform statistical analysis on the smaller elements of both programs. In this case, I found that scores for nurse communication, doctor communication, and communication about medications have no statistical relationship with 30-day COPD readmission rates.

Limitations of the Study

The results of this study were limited to the population of GACHs in Los Angeles County, California. In Los Angeles County, the sample size only contained the HRRP 30-day COPD readmission rates data, which only collects information on patients utilizing Medicare or Medicaid as insurance who were admitted into a GACH. This study did not

include Acute Myocardial Infarction, Heart Failure, Pneumonia, Coronary Artery Bypass Graft, Elective Primary Total Hip Arthroplasty, or Total Knee Arthroplasty in the study. (*Hospital Readmissions Reduction Program (HRRP) Measures*, n.d.) The HCAHPS and HRRP data sets exclude psychiatric, rehabilitation, long-term care, children's, critical access, and Prospective Payment System (PPS)-exempt cancer hospitals. (*Hospital Value-Based Purchasing (HVBP) Program Participation*, n.d.)

Recommendations

Based on the results of this study, nurse communication, doctor communication, and communication about medications did not have a statistically significant relationship with 30-day COPD readmission rates. Because of the limitations of this study, the study may be performed again using either a new population or a larger population to analyze again if a relationship exists between nurse communication, doctor communication, and communication about medications and 30-day COPD readmission rates.

I recommend that future research also test the relationship of provider communication in not-for-profit, for-profit, and university hospitals over larger geographical areas to analyze if a relationship exists between nurse communication, doctor communication, and communication about medications in hospitals with varying business models. However, because no relationship was found between nurse communication, doctor communication, and communication about medications with 30-day COPD readmission rates, future research may attempt to analyze the relationship between other nurse communication, doctor communication, and communication about

medications with the other diagnosis in the HRRP program to find if communication is more effective for varying diagnosis.

Implications for Professional Practice and Social Change

Implications for positive social change from this study are that certain types of provider communication did not reduce preventable 30-day COPD readmissions. Hospital administrators must find other communication methods to reduce preventable 30-day COPD readmission rates.

This study found no statistical relationship between nurse communication, doctor communication, and communication about medications with 30-day COPD readmission rates. However, other provider forms of provider communication exist. Hospital administrators should use this study to understand nurse communication, doctor communication, and communication about medications are not the communication types that impact preventable 30-day COPD readmission rates. They must study additional forms of provider communication to establish statistically significant forms of provider communication that impact preventable 30-day COPD readmission rates.

Conclusion

COPD readmissions cost $5.3 billion annually, and in the United States, more than half the hospitals fail to meet the COPD 30-day readmission rate benchmark. CMS implemented HRRP to reduce preventable 30-day readmissions. Since the program's implementation, most hospitals have failed to reduce preventable 30-day COPD readmission rates. (*Hospital Readmissions Reduction Program (HRRP)* | *CMS*, n.d.) The

hospital administrator's role is to improve patient care quality and take corrective actions when performance is failing. (Goldstein & Weinstein, 2020) Even though a statistically significant relationship between nurse communication, doctor communication, and communication about medications was not established in this study, hospital administrators may use these results as the foundation for continuing to find the answer to solving preventable 30-day COPD readmission rates.

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