Author: **Entinger, Melisa, A**
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STUDENT:

NAME Melisa Entinger **DATE: 5/10/2013**

ADVISER: (Committee Chair if MS Plan A or EdS Thesis or Field Project/Problem):

NAME Dr. Kristina Gorbatenko-Roth **DATE: 5/10/2013**

This section for MS Plan A Thesis or EdS Thesis/Field Project papers only
Committee members (other than your adviser who is listed in the section above)

1. **CMTE MEMBER'S NAME:** Dr. Erin Hall-Rhoades **DATE: 5/10/2013**

2. **CMTE MEMBER'S NAME:** Dr. Susan Staggs **DATE: 5/10/2013**

3. **CMTE MEMBER'S NAME:** **DATE:**

This section to be completed by the Graduate School
This final research report has been approved by the Graduate School.

Director, Office of Graduate Studies: **DATE:**

Entinger, Melisa A. ***Joint Commission Accreditation and the Quality of Patient Care in Hospitals***

Abstract

Assessing factors associated with the quality of care administered to hospital patients may provide information on factors that can impact better patient care. Previous research assessing hospital accreditation and patient quality of care is limited. This study assesses quality of care provided to patients in terms of clinicians performing practices proven to improve a patient's condition. This study sought to assess accreditation status, and whether hospitals accredited by The Joint Commission (TJC) perform processes of care for acute myocardial infarction (AMI), heart failure, and pneumonia patients at a higher average rate than hospitals not accredited by TJC. Also assessed was whether TJC accredited hospitals made larger gains in performance on process measures over five years. It was found that TJC hospitals made larger improvements in performance of processes for pneumonia care, non-accredited hospitals made larger improvements in AMI, and no statistically significant differences were found for five year improvement in performance of heart failure processes of care. The results of this study conclude that TJC accredited hospitals have higher performance of process of care for the conditions assessed and that future research should investigate what characteristics of accreditation or characteristics of hospitals may be influencing the findings of this study.

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Chapter I: Introduction

The definition of quality of care in health care services varies. Quality of health care can be defined and assessed in terms of the process of care delivered or the resulting outcomes of the care received. Various organizations such as The Joint Commission, Healthcare Facilities Accreditation Program, Det Norske Veritas Healthcare, Incorporated., and the Agency for Healthcare Research and Quality have tried to improve the quality of health care services. Hospital accreditation has provided a process to assess and address patient quality of care and safety related issues (Vallejo, Flies, & Fine, 2011). The accrediting organization of interest for this paper, The Joint Commission (TJC), is an independent, not-for profit organization, that is striving to improve health care for the public by collaborating with stakeholders, evaluating health care organizations, and inspiring health care organizations to provide the safest, most effective care of the best quality and value (The Joint Commission, 2012a). Today nearly 82 percent of hospitals in the United States of America are accredited by the Joint Commission (The Joint Commission, 2011b).

Terms Utilized in This Research Study and Their Corresponding Definitions

Hospital performance. Refers to the quality of care an institution provides based on how many times patients with a specific diagnosis receive the proper treatment according to the recommended process of care for that particular diagnosis.

Patient outcomes. Refers to the health impact treatment has on a patient (i.e. mortality, morbidity).

Performance measures. Indicators that processes of care follow evidence-based practices.

Processes of care. Evidence-based medicine practice for conditions that are theoretically designed to lead to better patient outcomes.

Quality of care. References the level of adherence to processes of care which are intended to lead to better patient outcomes.

Hospital Accreditation

Why hospitals seek accreditation. The Medicare Act of 1965 required hospitals to meet certain quality and safety standards. The Medicare Conditions of Participation published first in 1966, revised several times since, outlined quality and safety standards that hospitals must meet in order to receive Medicare reimbursement for patient care (Vallejo et al. 2011). Part of The Joint Commission's eminence may be attributed to privileges that the organization had to inspect hospital compliance with quality and safety standards. Within the Medicare Act, authority was granted to The Joint Commission on Accreditation of Hospitals (what is currently known as The Joint Commission) to be an authority able to inspect hospitals compliance with Medicare standards. However, hospitals did have the choice to be evaluated by a state agency or the American Osteopathic Association's Healthcare Facilities Accreditation Program. It is TJC's unique privilege though that may explain in part the TCJ's superiority over other hospital accrediting organizations. Congress passed legislation in 2008 that required all hospital accrediting organizations, including TJC, to apply for deeming accreditation authority through the Center for Medicare Services (CMS). In essence, this removed TJC's statutory accrediting authority and allowed other organizations to be granted deeming authority through CMS (Vallejo et al. 2011).

Deterrents to seeking Joint Commission accreditation. Although there are many motivating factors and benefits associated with a hospital obtaining accreditation from The Joint

Commission (TJC), there are also associated cons for an organization to select TCJ for hospital accreditation. The predominant factors that may deter an organization from seeking accreditation from TJC encompass three main areas: finances, hospital support staff, and time restraints (Blackmond, 2009). Annual and surveying fees in order to obtain accreditation from TCJ vary according to the size and service complexities of each hospital (Vallejo et al. 2011). Information from 2010 reports that annual fees for TJC accreditation can range from $1,780 to $36,845, and fees for a hospital to have an onsite survey are noted as costing $2,500 per surveyor for the first day of surveying and $1,030 per surveyor for each additional day of surveying. There are also numerous indirect costs associated with TCJ accreditation that can add up to or exceed the fees directly associated with accreditation. These indirect costs include the annual purchase of a TJC standards manual, various publications, education of hospital staff, and additional costs associated if external consultants are hired to help the hospital prepare for TJC onsite surveys (Vallejo et al. 2011). The direct and indirect costs associated with obtaining TJC accreditation can lead some hospitals away from considering accreditation, especially rural and critical access hospitals (Blackmond, 2009). Smaller hospitals with less staff may lack the staffing resources necessary to prepare a hospital for TJC surveys. Furthermore, if a hospital is found to not meet TJC requirements, significant time may need to be invested by staff so that a hospital can meet TJC standard.. In addition, if TJC standards are changed a hospital must then invest the necessary staffing time and financial resources to be in compliance with the new standards (Blackmond, 2009).

Motivation for Joint Commission accreditation. On the contrary, receiving accreditation from the Joint Commission (TJC) is desired by hospitals because of the benefits that come with accreditation status. Accreditation through the Joint Commission is purported to

help hospitals develop and improve patient safety efforts, provides education to hospitals regarding best medical practices, and identifies methods to enhance business operations (The Joint Commission, 2011a). A hospital wishing to obtain or maintain accreditation must be thoroughly reviewed by TJC and is subject to multiple on-site surveys. After being awarded accreditation, to maintain accreditation, a hospital can expect unannounced surveys to assess the hospitals compliance with standards outlined by TJC (The Joint Commission, 2011a). There are inherent benefits to having the oldest and largest private accrediting organization provide an assessment and validation of the quality of care at a hospital (HCPro, 2006). Subsequently, the preparation and results of performance reviews at hospitals provide the opportunity for the organization to identify weaknesses and improve on their processes of care. There are also reimbursement benefits that are associated with being accredited by TJC as some insurance companies and third-party payers will only reimburse for care received at a TCJ accredited hospital (HCPro, 2006).

The rigor of the Joint Commission's evaluation process and the organization's notoriety for being committed to quality of care impacts consumers' perceptions regarding hospital quality. Specifically, it gives consumers confidence that an accredited organization is meeting or exceeding established performance standards and is committed to improving the quality of services and care that they provide to patients (The Joint Commission, 2012a).Yet, notoriety and perceptions aside, the question remains, 'Does TJC accreditation actually lead to better patient outcomes and processes of care?' This chapter reviews literature pertaining to this question.

Measurement of Patient Outcomes

Direct measurement. Some direct measures of patient outcomes of medical care are morbidity and mortality. When measuring the quality of care that a patient receives, direct

measurement of patient outcomes is often impacted by numerous extraneous variables that are beyond the control of medical practitioners. Patients can have a significant influence on whether medical treatment will result in mortality or morbidity. Factors such as whether a patient follows prescription instructions or receives the recommended follow-up care can have significant impacts on whether the medical treatment they received at a hospital will benefit them or result in increased morbidity or mortality.

Indirect measurement. There are several advantages to measuring patient outcomes through indirect measures. Medical practitioners have greater control over whether a patient is treated according to evidence based recommended processes of care. When there is strong evidence that a specific process can have a substantial impact on patient outcomes, process data can serve as an indirect measure of outcome attainability (Palmer, 1998). For example, in a random control clinical trial, heart failure patients who were prescribed angiotensin converting enzyme (ACE) inhibitors reported lower hospital readmission and mortality rate than patients who were assigned a placebo (Flather et al., 2000). Medical practitioners have a direct influence on whether a patient receives ACE inhibitors, and therefore whether they will receive the associated benefits.

Given the established relationship between patient outcomes and hospitalization processes of care, reporting on performance measures and the collection of such data has become instilled into the health care delivery process (Friedberg & Landon, 2012). Indirect measurement data can be helpful to hospitals if they utilize the results to gain an understanding of the underlying causes or contributing factors to their performance, and devise systems that can lead to better performance and subsequently better quality of patient care (Friedberg & Landon, 2012).

Public Reporting of Hospital Performance

In 1997 The Joint Commission introduced the ORYX initiative which integrates outcomes and performance measure process data into their accreditation process (The Joint Commission, 2011c). Further, only since 2002 has the Joint Commission required hospitals to collect and submit data on standardized performance measures; this data is now available to the public through their website (http://www.jointcommission.org).

Another initiative, Hospital Compare (HC), established through the efforts of the Centers for Medicare & Medicaid Services and numerous consumer hospital, doctor, employer, accrediting organizations, and Federal agencies, also provides publically accessible data on quality of care in hospitals, both TJC accredited and not (U.S. Department of Health and Human Services, 2012). Currently, HC reports information on over 4,000 Medicare-certified hospitals (http://www.hospitalcompare.hhs.gov/) (U.S. Department of Health and Human Services, 2012). Examining the true versus purported influence accreditation has on patient quality of care is therefore able to be assessed due to the alignment of performance measures between the Joint Commission's ORYX initiative and Hospital Compare databases.

Empirical Studies Accessing Relationship between Accreditation Status & Hospital Process Data

Supporting studies. Research has found The Joint Commission's (TJC) accreditation to be strongly associated with better quality of care, defined in terms of processes, for patients with acute myocardial infarction, heart failure, and pneumonia (Landon et al., 2006). A second study assessed performance data from 2004 and 2008 reporting periods from TJC and the Centers for Medicare and Medicaid and found that Joint Commission accredited hospitals not only were found to have better baseline performance in 2004, but demonstrated larger gains in quality of

care over the five year period (Schmaltz, Williams, Chassin, Loeb, & Wachter, 2011). In this study a high rate of performance of a measure was defined as achieving a performance rate of 90% or more on a performance measure. It was found that TJC accredited hospitals reached this significance level more frequently than hospitals not accredited by the TJC for 13 of the 16 performance measures for acute myocardial infarction, heart failure, and pneumonia (Schmaltz et al., 2011).

A review of data from 134,579 Medicare patients diagnosed with acute myocardial infarction found accredited hospitals on average provided a higher quality of care, and had a lower 30-day mortality rate than non-accredited hospitals (Chen, Rathore, Radford, & Krumholz, 2003). For example, it was found that patients admitted to a Joint Commission accredited hospital acute myocardial infarction were more likely to receive aspirin and beta blockers both upon hospital admission and during hospitalization, and were more likely to receive reperfusion therapy (Chen et al., 2003).

Statistically significant results for processes of improved care were found for acute myocardial patients receiving aspirin upon arrival at accredited hospitals. It was also found that heart failure patients received an ACE inhibitor and smoking cessation advice or counseling more often at accredited hospitals. This study also found that accredited hospitals outperformed non-accredited hospitals in providing smoking cessation advice or counseling to pneumonia patients, although neither type of hospital performed significantly well on this process of care measure. Also noted, was that for six of the 13 process quality measures, accredited hospitals ranked in the top half of performing hospitals statistically more than non-accredited hospitals: higher attainments of the percent of acute myocardial infarction patients given aspirin at arrival; percent of heart failure patients given ACE inhibitor for LVSD, receiving assessment of left

ventricular failure, receiving comprehensive discharge instructions; percentage of pneumonia patients given appropriate initial antibiotic selection; and pneumonia patients age 65 and older who were screened for pneumococcal vaccine status and the administration of the vaccine prior to discharge, if indicated (Lutfiyya, Sikka, Mehta, & Lipsky, 2009).

Challenging studies. Although research has generally found a relationship between accreditation and the quality of care, some research findings dispute this claim and/or the implications of the findings. One such study assessing the relationship between accreditation scores and mortality rates found only a mild relationship between a hospitals accreditation score and mortality rate (Joshi, 2003). Although some of the process measures have been found to be significantly related with 30-day mortality rates, an analysis of the process measures from 2002-2003 for acute myocardial infarction (AMI) found the process measures to account for only six percent of hospital variation for risk-standardized 30-day mortality rates (Bradley et al., 2006). Another study found hospital performance measures predict such small differences in hospital risk-adjusted mortality rates suggesting that performance measures are not correlated strongly enough to patient outcomes (mortality rates) (Werner & Bradlow, 2006). This study analyzed 2004 Hospital Compare performance measure data available from the Centers for Medicare & Medicaid Services. The assessment included data from 3,657 acute care hospitals for 10 *p*erformance measures pertaining to AMI, heart failure, and pneumonia. When comparing the risk-adjusted mortality rates for hospitals that performed process measures in the 25th percentile to those performing in the 75th percentile, small differences in mortality reduction were found for each of the conditions (absolute risk reduction rates; AMI: inpatient mortality = 0.005, 30-day mortality = 0.006, and 1-year mortality = 0.012; heart failure: inpatient mortality = 0.001, 30-day mortality = 0.001, and 1-year mortality = 0.002; pneumonia: inpatient mortality = 0.005,

30-day mortality = 0.001, and 1-year mortality = 0.003). While performance on process of care measures did predict some statistically significant differences in risk-adjusted mortality rates these differences were rather minimal. This study suggests that improved performance on process measures may lead to very minute reductions in mortality. These findings suggest that the performance measures that are being evaluated may not be the most optimal processes to be measuring, and instead efforts should be dedicated to identifying performance measures that have a greater association with patient outcomes (mortality) (Werner & Bradlow, 2006).

Equivocal Outcome Support for One Process Measure: Smoking Cessation Counseling

There has been much debate over the process of care measure for smoking cessation counseling that was being utilized during the reporting periods of interest for this study (2007 and 2011). Regarding measurement for the process of care some state that smoking cessation advice/counseling cannot be classified as an accountability measure because of the way in which the process was measured; a practitioner marks off the box that it was provided to the patient or a simple note indicated on the patients chart that counseling occurred (Chassin, Loeb, Schmaltz, & Wachter, 2010). Subsequently, effective January 1, 2012 the performance measure of providing smoking cessation counseling for acute myocardial infraction, heart failure, and pneumonia patients was retired by The Joint Commission and the Centers for Medicare and Medicaid Services (The Joint Commission, 2012b). This measure has since been replaced with a set of Tobacco Cessation Measures that incorporate providing evidence-based cessation counseling, medications, and referrals at discharge (Fiore, Goplerud, & Schroeder, 2012). Considering that this study's data for smoking cessation is on the old and unreliable smoking cessation measure, smoking cessation data will not be analyzed in this study.

Summary of Research on Accreditation

Although the research is limited, studies have reported hospitals accredited by The Joint Commission (TJC) provide a higher quality of care (defined in terms of adherence to processes of care for acute myocardial infarction, heart failure, and/or pneumonia patients) compared to non-accredited hospitals. Other studies have questioned the validity of such research as it remains unclear what factors contribute to a high level of performance on process measures at TJC accredited hospitals. Considering that the research on TJC accreditation is very limited and few studies have utilized the larger publically available datasets only recently made available (HC and ORYX databases) this study will further explore the relationship between TJC accreditation and performance on the recommended processes of care for patients. The data used in this study will focus on acute myocardial infarction, heart failure, and pneumonia patients and the associated processes of care for each of these conditions.

Conditions of Interest

Acute myocardial infraction. Acute myocardial infraction is the leading cause of death in the United States of America (Bolooki & Askari, 2010). Approximately 1.2 million Americans suffer an acute myocardial infarction each year (National Heart Lung and Blood Institute, 2011). Many people that suffer an acute myocardial infarction could survive or have a better recovery if they received medical treatment faster. About half of the people who die from an acute myocardial infarction die within an hour of when symptoms first onset and often death occurs before the person reaches a hospital (National Heart Lung and Blood Institute, 2011).

Predictors of better outcomes for acute myocardial infarction. Long-term use of beta blockers (approximately one year) post hospital discharge has proven to decrease mortality by approximately 25% (Yusuf, Lewis, Collins, & Sleight, 1985). The use of beta blockers for AMI

has a Grade 1A recommendation from UpToDate[1], which is a strong recommendation in which the benefits clearly outweigh the risks for the majority of patients, and the evidence is of high-quality and substantial (Rosenson, Reeder, and Kennedy, 2012). Being that smoking is a major risk factor for AMI, smoking cessation is essential in recovery, overall long-term health, and decreasing subsequent myocardial infarction (Bolooki & Askari, 2010).

Heart failure. The prevalence and health care costs associated with heart failure are staggering. According to the American Heart Association 5.7 million Americans are living with heart failure and 670,000 new cases are being diagnosed. Approximately 1 million hospital admissions are of patients with a primary diagnosis of heart failure, and another 2 million admissions are of patients who have a secondary diagnosis of heart failure occur annually (Hobbs & Boyle, 2010). In 2009 the cost of care for heart failure patients was estimated to be 37 billion dollars (American Heart Association, 2010). Furthermore, more Medicare dollars are spent on the care for heart failure patients than patients with any other diagnosis. It has been found that nearly 25 percent of Medicare patients that are hospitalized for heart failure will return to the hospital within 30 days of discharge (American Heart Association, 2010).

Predictors of better outcomes for heart failure. Although there currently is no cure for heart failure, heart failure care has advanced beyond just alleviating patient symptoms (Heart Failure Society of America, 2002). As people have become more educated on the condition of heart failure, and better able to identify the presenting symptoms, people have become more likely to see their physician sooner and receive the benefits from medications. Not only can medications improve how patients physically feel, but medications also have a substantial impact

[1] UpToDate is an evidence based knowledge system that is authored by physicians, and written and edited by a community of world-renowned experts in their specialties.

on slowing the progression of heart failure or even reversing some of the structural and functional heart changes. Early detection and advancements in treatments have resulted in heart failure patients being able to live a more normal lifestyle (Heart Failure Society of America, 2002). UpToDate lists ACE inhibitors for the treatment of heart failure patients with left ventricular systolic dysfunction as a Grade 1A recommendation (Colucci, 2012). This is a strong recommendation in which the benefits clearly outweigh the risks for the majority of patients, and the evidence is of high-quality and substantial (Colucci, 2012).

Pneumonia. Pneumonia, an infection of the lungs caused by bacteria or viruses, is a communicable disease in which some cases can be prevented if vaccination is obtained (American Lung Association, 2012). Globally, pneumonia is responsible for more deaths than any other infectious disease (CDC 2012). In 2009 it was reported that 1.1 million Americans were hospitalized with pneumonia, and of those approximately 50,000 died from the disease. Bacterial pneumonia is responsible for the most deaths of any potential vaccine-preventable disease in the United States of America (CDC, 2012). Pneumonia can usually, but not always, be treated through the administration of antibiotics or antiviral drugs (CDC, 2009). Adults age 65 or older and those under 64 years of age who either have an underlying medical condition, smoke cigarettes, or have asthma are at an increased risk of developing pneumonia (CDC, 2009).

Predictors of better outcomes for pneumonia. Pneumococcal polysaccharide vaccine (PPSV) can protect people from 23 different types of pneumococcal bacteria (CDC, 2009). There are several reasons that blood cultures are advocated for in hospitalized patients with pneumonia. If the blood culture is found to be positive for a pathogen, the microbial diagnosis can also be identified (Bartlett, 2012). The data obtained from blood cultures is then utilized to

evaluate the efficacy of current pneumonia vaccines as well as influence decisions on future vaccines (Bartlett, 2012).

Chapter II: Methodology

The purpose of this research is to further examine the relationship between Joint Commission (TJC) accreditation status and the quality of care administered at hospitals. This study explores the differences in quality of care administered at hospitals that have (TJC) accreditation and hospitals that do not have TJC accreditation. This study examines the relationship between (TJC) accreditation status and hospital performance on 10 quality of care measures for three conditions: acute myocardial infarction, heart failure, and pneumonia. This study will analyze recent data, comparing data from the 2007 and 2011 reporting periods. To compare the quality of care administered to patients for each condition, a composite score was calculated by averaging the means of the performance measures of interest for each condition. The result was that each hospital had three scores, one score each that represents their overall performance for acute myocardial infarction, heart failure and pneumonia. For this study, 10 measures will be utilized to calculate the three mean scores. Four measures pertaining to acute myocardial infraction care will be included: angiotensin converting enzyme inhibitor or angiotensin II receptor blocker for left ventricular systolic dysfunction, aspirin at arrival, aspirin at discharge, and beta blocker at discharge. Three measures pertaining to heart failure care will be used: angiotensin converting enzyme inhibitor or angiotensin II receptor blocker for left ventricular systolic dysfunction, evaluation of left ventricular systolic function, and discharge instructions. As well as three measures relating to pneumonia care: assessed and given influenza vaccination, assessed and given pneumococcal vaccination, and patients whose initial emergency room blood culture was performed prior to the administration of the first hospital dose of antibiotics.

Hypotheses

H1: Joint Commission (TJC) accredited hospitals will have significantly higher 2011 mean performance scores for all conditions of interest when compared to non TJC accredited hospitals.

Conditions of interest:

H1A: Acute myocardial infarction.

H1B: Heart failure.

H1C: Pneumonia.

H2: Joint Commission (TJC) accredited hospitals will have made significantly larger gains in the mean performance on the process of care measures indicated below over the five-year period of interest (2007 to 2011) compared to non-accredited hospitals.

Conditions of interest:

H2A: Change in Acute myocardial infarction.

H2B: Change in Heart failure.

H2C: Change in Pneumonia.

Subject Selection and Description

Subjects for this study are hospitals. The treatment group are hospitals accredited by The Joint Commission (TJC); the control group, the non-TJC accredited hospitals. Each hospital listed in the Centers for Medicare and Medicaid Services Hospital Compare database was grouped into one of the two categories based on their Joint Commission accreditation status during the 2007-2011 time frames. Hospitals were grouped according to: 1) hospitals not accredited at any time during the period of interest for this study and 2) hospitals that were identified as being accredited both in 2007 and 2011. It is assumed that hospitals identified as accredited in 2007 and 2011 data maintained accreditation status for the entire time frame, although it is possible

that a hospital may not have been accredited for the entire five year period. A separate group was not created to account for hospitals that had TJC accreditation status for one to four years during the five year period of interest. The assumption that all hospitals identified as TJC accredited in 2007 and 2011 data maintained accreditation status for the entire time frame of interest is believed to have a minimal impact on the results for this study. Schmaltz, Williams, Chassin, Loeb, and Wachter (2011) found that hospitals categorized as having received accreditation between one to four years tended to perform on process measures half-way between hospitals accredited for the entire five year period of interest, and hospitals that were never accredited. Considering the Schmaltz et al. (2011) findings, a separate group was not created for hospitals accredited for one to four years.

Procedures

1. Identify condition of each hospital in the TJC ORYX database as either treatment (accredited) or control (non-accredited).
2. For each hospital, identify hospital performance data for each of the 10 process variables of interest. This data comes from the Centers for Medicare and Medicaid's Hospital Compare database.
3. The 2007 data for the performance of processes of care is reported in four quarters. The four quarters of data will be combined into one database so that an overall 2007 mean score for each condition can be calculated (one for acute myocardial infarction, heart failure, and pneumonia).
4. The data for 2011hospital performance for processes of care is reported in one database. For the 2011 data, a mean was calculated for all process of care, one for each of the three conditions of interest (acute myocardial infarction, heart failure, and pneumonia).

5. To calculate the change in the quality of care a hospital provides over the five year period of interest, the overall mean 2007 score for each of the three conditions was subtracted from the overall mean 2011 score for each of the hospitals. This will result which in a new calculated variable that quantifies the percent change in a hospital's performance of processes over five years.
6. The data will be combined from the databases into one large dataset, and then the data will be prepared for analysis.

Measures

Processes of care. The primary data source for this study was the Centers for Medicare and Medicaid Services Hospital Compare database (https://data.medicare.gov/browse?tags=hospital+compare). The 2011 reporting period data was obtained from the website while the 2007 data was obtained by contacting measure download support. This was the primary database used for this study since both TJC accredited and non-accredited organizations report data to the Centers for Medicare and Medicaid Database. From this database hospital names and process of care data for the three conditions of interest (acute myocardial infarction, heart failure, and pneumonia) over the two timer periods were obtained.

Accreditation status. Several databases were consulted to identify which hospitals had accreditation status during both the 2007 and 2011 years. The 2011 data that was utilized to identify Joint Commission (TJC) accredited hospitals was obtained from the ORYX database (http://www.healthcarequalitydata.org/). To determine which hospitals had TJC accreditation in 2007, accreditation information was obtained from an individual from TJC. To determine which hospitals were TJC accredited in 2007 an individual from TJC downloaded 2007 data from the Center for Medicare Services (CMS) and then used the CCN numbers (CMS Certification

Number) to search the TJC's current database of accredited hospitals to identify those for which data exists in the Centers for Medicare and Medicaid Database. Also obtained was a list of hospitals that became unaccredited on or after January 1, 2007. These sources of information were used to determine which hospitals were TJC accredited in 2007.

Data Analysis

The Statistical Program for Social Sciences version 21.0 (SPSS, 2012) will be used to analyze the data. Scores on performance measures ranged from zero to 100, with 100 being a perfect score representing that hospitals performed a process measure 100% of the time they treated a patient with a given condition. Scores varied greatly across the spectrum of zero to 100 for all conditions of interest. However, outliers were not removed from the data, as the data is believed to accurately represent the variation in hospitals' performance of the process of care measures. To assess if there is a statistically significant difference between TJC accredited and non-accredited hospitals in 2011 on each of the 3 hospital performance mean scores, *t*-tests will be conducted, one for each of the three conditions. For each test, a significance level of $p < .05$ will be used.

Also of interest is assessing the amount of change in performance on process of care measures over the five-year period of interest (2007-2011). Specifically, comparing TJC accredited and non-accredited hospitals and whether accreditation status is related to improvement in performance with the timeframe of interest. To assess this change *t*-tests will be conducted, one for each of the three conditions utilizing the difference scores that were calculated for the change in performance over five years. For each test, a significance level of $p < .05$ will be used.

Chapter III: Results

The purpose of this study is to analyze the relationship between Joint Commission (TJC) accreditation and the quality of care patients receive at hospitals (quality of care is defined in this study as clinicians' performance of process measures known to improve a patient's medical condition). Independent-samples *t*-tests were conducted to evaluate whether there is a difference between the mean score for a hospitals performance on the processes of care measures of interest pertaining to three medical conditions (acute myocardial infarction, heart failure, and pneumonia). Also conducted was a step-wise linear regression to assess if differences exist in hospital performance of processes of care over the five-year period of interest. Of specific interest, is whether improvement in performance of processes is associated with being an accredited hospital.

Differences in Quality of Care and Accreditation Status

H1: Acute myocardial infarction. Each hospital's mean AMI score was computed by averaging the hospitals' performance on four processes of care (angiotensin converting enzyme inhibitor or angiotensin II receptor blocker for left ventricular systolic dysfunction, aspirin at arrival, aspirin at discharge, and beta blocker at discharge). An independent-samples *t*-test was conducted utilizing 2011 hospital mean AMI scores to evaluate whether there was a difference between Joint Commission (TJC) accredited hospitals and non-accredited hospitals performance of processes of care pertaining to AMI. The results indicated that there was statistically significant differences between the TJC mean AMI score for accredited hospitals ($M = 97.99$, $SD = 3.90$) compared to the mean AMI score of non-accredited hospitals ($M = 97.27$, $SD = 6.58$), $t(2,675) = 3.31$, $p = .00$. Given the significant finding, a post-hoc effect-size was calculated. The effect size for the performance of AMI processes and the differences between TJC accredited

hospitals and non-accredited hospitals was $d = .13$, signifying that TJC accreditation has a minimal effect on the performance of the recommended processes of care for AMI patients. Table 1 highlights AMI findings comparing TJC accredited and non-accredited hospitals performance of the recommended processes of care.

Table 1

Hospital Accreditation and 2011 Process of Care Scores for Acute Myocardial Infarction

TJC Accreditation Status	Frequency (N=2,677)	Mean %	Standard Deviation
Accredited	1538	97.99	3.90
Not Accredited	1139	97.27	6.58

H2: Heart failure. A hospital's mean heart failure score was computed by averaging the hospitals performance of three processes of care (angiotensin converting enzyme inhibitor or angiotensin II receptor blocker for left ventricular systolic dysfunction, evaluation of left ventricular systolic function, and discharge instructions). An independent-samples *t*-test was conducted utilizing 2011 hospital mean heart failure scores to evaluate whether there was a difference between Joint Commission (TJC) accredited hospitals and non-accredited hospitals performance of processes of care pertaining to heart failure. The results indicated that there was statistically significant differences between the TJC mean heart failure score for accredited hospitals ($M = 95.21$, $SD = 6.29$) compared to the mean heart failure score of non-accredited hospitals ($M = 85.54$, $SD = 18.44$), $t(3,943) = 18.94$, $p = .00$. Again, given the significant finding, a post-hoc effect-size was calculated. The effect size for the performance of heart failure processes and the differences between TJC accredited hospitals and non-accredited hospitals was $d = .70$, signifying that TJC accreditation has a moderate effect on the performance of the

recommended processes of care for heart failure patients. Table 2 presents the differences found between TJC accredited and non-accredited hospitals performance of the recommended processes of care for heart failure patients.

Table 2

Hospital Accreditation and 2011 Process of Care Scores for Heart Failure

TJC Accreditation Status	Frequency (N=3,945)	Mean %	Standard Deviation
Accredited	2,558	95.30	6.29
Not Accredited	1,387	85.54	18.44

H3: Pneumonia. A hospital's mean AMI score was computed by averaging the hospitals performance of three processes of care (assessed and given influenza vaccination, assessed and given pneumococcal vaccination, and patients whose initial emergency room blood culture was performed prior to the administration of the first hospital dose of antibiotics). An independent-samples *t*-test was conducted utilizing 2011 hospital mean pneumonia scores to evaluate whether there was a difference between Joint Commission (TJC) accredited hospitals and non-accredited hospitals performance of processes of care pertaining to pneumonia. The results indicated that there was statistically significant differences between the TJC mean pneumonia score for accredited hospitals ($M = 95.18$, $SD = 7.18$) compared to the mean pneumonia score of non-accredited hospitals ($M = 88.92$, $SD = 14.50$), $t(4,511) = 16.00$, $p = .00$. Given the significant finding, a post-hoc effect-size was calculated. The effect size for the performance of pneumonia processes and the differences between TJC accredited hospitals and non-accredited hospitals was $d = .55$, signifying that TJC accreditation has a moderate effect on the performance of the recommended processes of care for pneumonia patients. A medium effect size was found

indicating that differences found between the means of TJC accredited and non-accredited hospitals and their performance of processes of care for pneumonia is of moderate magnitude. Table 3 highlights the differences found in TJC accredited hospitals and higher performance of process of care measures for pneumonia.

Table 3

Hospital Accreditation and 2011 Process of Care Scores for Pneumonia

TJC Accreditation Status	Frequency (N=4,513)	Mean %	Standard Deviation
Accredited	2573	95.18	7.18
Not Accredited	1580	88.92	14.50

Change in Quality of Care Over Time

H2A: Acute myocardial infarction. Each hospital's 2007 mean acute myocardial infraction (AMI) score was subtracted from each hospitals 2011 mean AMI score to assess the change in performance of the processes of care for AMI. An independent-samples *t*-test was conducted utilizing the difference scores to evaluate whether there was a difference between Joint Commission (TJC) accredited hospitals and non-accredited hospitals change in performance of processes of care over five years. The results indicated statistically significant differences exist between TJC hospital improvement over five years and non-accredited hospitals improvement. TJC accredited hospitals ($M = 7.95$, $SD = 10.44$) made smaller gains in improvement of performing process measures for AMI compared to non-accredited hospitals ($M = 13.66$, $SD = 20.36$), $t(2,065) = -6.63$, $p = .00$. Given the significant finding, a post-hoc effect-size was calculated. A small effect size was found, $d = -.35$, signifying that TJC accreditation has a small effect on the performance of the recommended processes of care for AMI patients.

Table 4 highlights AMI findings comparing TJC accredited and non-accredited hospitals change in performance of the recommended processes of care from 2007 to 2011.

Table 4

Hospital Accreditation and the Five Year Change in Performance for Process of Care Scores for Acute Myocardial Infarction

TJC Accreditation Status	Frequency (N=2,067)	Mean %	Standard Deviation
Accredited	1444	7.95	10.44
Not Accredited	623	13.66	20.36

H2B: Heart failure. Each hospital's 2007 mean Heart failure score was subtracted from each hospitals 2011 mean heart failure score to assess the change in performance of the processes of care for heart failure. An independent-samples *t*-test was conducted utilizing the difference scores to evaluate whether there was a difference between Joint Commission (TJC) accredited hospitals and non-accredited hospitals change in performance of processes of care over five years.. There was no statistically significant difference found between TCJ hospital (M = 14.83, SD = 12.01) improvement in performing process measures for heart failure when compared to non-accredited hospitals (M = 14.85, SD = 20.43), $t(3,567) = -.03$ $p = .98$. Table 5 highlights heart failure findings comparing TJC accredited and non-accredited hospitals change in performance of the recommended processes of care from 2007 to 2011.

Table 5

Hospital Accreditation and the Five Year Change in Performance for Process of Care Scores for Heart Failure

TJC Accreditation Status	Frequency (N=3,569)	Mean %	Standard Deviation
Accredited	2,510	14.85	12.01
Not Accredited	1,059	14.83	20.43

H2C: Pneumonia. Each hospital's 2007 mean pneumonia score was subtracted from each hospitals 2011 mean pneumonia score to assess the change in performance of the processes of care for pneumonia. An independent-samples *t*-test was conducted utilizing the difference scores to evaluate whether there was a difference between Joint Commission (TJC) accredited hospitals and non-accredited hospitals change in performance of processes of care over five years. The results indicated statistically significant differences exist between TJC hospital improvement over five years and non-accredited hospitals improvement. TJC accredited hospitals ($M = 25.46$ $SD = 22.31$) made larger gains in improvement of performing process measures for pneumonia compared to non-accredited hospitals ($M = 20.45$, $SD = 27.60$), $t(3,105) = 4.97$, $p = .00$. Given the significant finding, a post-hoc effect-size was calculated. The effect size for the performance of pneumonia processes of care and the differences between TJC accredited hospitals and non-accredited hospitals was $d = .20$, signifying that TJC accreditation has a minimal effect on the performance of the recommended processes of care for pneumonia patients. Table 6 highlights pneumonia findings comparing TJC accredited and non-accredited hospitals change in performance of the recommended processes of care from 2007 to 2011.

Table 6

Hospital Accreditation and the Five Year Change in Performance for Process of Care Scores for Pneumonia

TJC Accreditation Status	Frequency (N=3,107)	Mean %	Standard Deviation
Accredited	2134	25.46	22.31
Not Accredited	973	20.45	27.60

Chapter IV: Conclusion

Discussion

The purpose of this research was to explore the quality of care patients receive in hospitals in accordance with the administration or performance of processes of care that should result in better outcomes for the patient. Performance measures are established on evidence based practices; if these practices are performed, they should improve a patient's medical condition outcome. Therefore, identifying factors that contribute to or are associated with clinicians' performance of these practices may provide information that could lead to hospitals making changes that improve the quality of care they provide to patients. This study sought to explore if one such factor, accreditation from an external organization (TJC), is 1) related to a higher level of performing evidence based process of care for acute myocardial infarction, heart failure, and pneumonia patients and 2) whether TJC accredited hospitals make larger improvements in performance over a five year span of time.

In 2011, TJC accredited hospitals had significantly higher mean scores for the performance of the processes of care compared to non-accredited hospitals for each of the three conditions of interest (acute myocardial infraction, heart failure, and pneumonia). Accreditation had the greatest influence on the performance of heart failure processes of care (d = .70), followed by pneumonia (d = .55), and then AMI (d = .13). Also of interest was whether accreditation was a contributing factor to hospitals obtaining higher mean scores in 2011 and if accreditation over time helped them improve these scores. To assess the change in performance of the recommended processes of care over time, data from five years previous was consulted to calculate the average amount of change at accredited and non-accredited hospitals.

The findings were mixed when assessing improvement in quality from 2007 to 2011. Hospitals not accredited by the TJC made larger gains in performance of process measures for AMI, no differences in improvement were found for heart failure, and TJC accredited hospitals made greater improvements than non-accredited hospitals in the performance of the processes of care for pneumonia. The mean score for 2011 TJC AMI performance was greater than the mean performance for non-accredited hospitals. Therefore, the finding that non-accredited hospitals made larger gains in the mean performance indicates that non-accredited hospitals were performing the processes of care on average significantly less than TJC accredited hospitals in 2007. Although non-accredited hospitals made larger gains over the five year period, they were still performing AMI processes of care less in 2011 than clinicians at TJC accredited hospitals were in 2011. No significant differences were found when comparing TJC accredited and non-accredited hospitals and the changes in performance of the recommended processes of care for heart failure patients. The 2011 mean performance of the heart failure processes of care that were included in this study revealed that clinicians at TJC accredited hospitals were performing the processes of care significantly more than at non-accredited hospitals. This suggests that TJC hospitals were performing the heart failure processes of care at a higher rate than non-accredited hospitals in 2007 as well. The TJC mean performance was already relatively high and therefore there was less room for improvement to be made on performance of the processes of care. Pneumonia proved to be the only condition of those studied where TJC accredited hospitals reported significantly larger gains in performance of the processes of care compared to non-accredited hospitals. TJC accredited hospitals also reported a significantly larger performance mean in 2011 ($M = 95.18$) compared to non-accredited hospitals . However, the effect size for

change over the five year time frame just made the cutoff to be considered an effect of minimal magnitude .

Although statistically significant differences were found between 2011 mean process of care scores for all three conditions, the effect sizes should be considered to assess the magnitude or meaningfulness of hospitals being accredited and their performance of the recommended processes of care.. The magnitudes of the findings varied with the effect size being small for performance of the recommend process of care for pneumonia, medium for acute myocardial infraction, and a large magnitude in the difference in performance of processes of care was found for heart failure. The effect size for pneumonia $d = .03$ indicates that the differences found between TJC accredited and non-accredited hospitals and the mean performance of the processes of care for this condition are of very little significance. While the differences in performance for heart failure $d = .71$ are of a much higher magnitude and suggest a significant and perhaps clinically important impact that accreditation has on the performance of the recommended processes of care.

The findings of this study that hospitals accredited by The Joint Commission have higher 2011 performance rates for the recommended processes of care studied (AMI, heart failure, and pneumonia) is consistent with previous research that has identified TJC hospitals as performing best-practices processes more often, or providing a better quality of care in terms of providing recommended processes of care. Specifically, the findings in this study coincide with the findings of Schmaltz et al. (2011) which found Joint Commission (TJC) accredited hospitals had better baseline performance in 2004 than non-accredited hospitals. However, their assessment of five-year change in hospital performance of the recommended processes of care found that accredited hospitals significantly improved their performance more than non-accredited hospitals

did for 13 of the 16 processes of care that they focused on. (the three processes where significant improvements were not found were not utilized in the current study as these processes were not utilized in both 2007 and 2011.) The results of this study found mixed results in improvement over a five-year period. These differences may be partially attributed to not controlling for hospital characteristics. The results of this study found similar findings to Chen, Rathore, Radford, and Krumholz (2003) in that TJC accredited hospitals administered aspirin and beta-blockers to acute myocardial infraction patients. The current study calculated a hospital's mean performance on process measures for AMI which included an additional process of care not utilized in the Chen et al (2003) study (providing angiotensin converting enzyme inhibitor or angiotensin II receptor blocker for left ventricular systolic dysfunction).

Implications

The results of this study are relevant for hospitals considering obtaining accreditation from The Joint Commission, or hospitals reviewing whether they should renew their accreditation. Considering the significant costs associated with obtaining and maintaining accreditation, there needs to be substantial benefits for a hospital. Focusing on whether accreditation can help a hospital improve the quality of care it provides to patients, a hospital should first consider what their performance levels are of the recommended processes of care. If a hospital is already performing the recommended processes of care at a relatively high rate (close to 100% of patients are receiving the recommended care) than there is a limitation to how much accreditation may be able to facilitate a higher rate of performance. In cases such as this having accreditation for the purpose of improving performance of the recommended processes of care would prove of little benefit.

Perhaps the most notable finding from this study is that hospitals accredited by The Joint Commission reported statistically higher means in 2011 for the three conditions of interest (acute myocardial infraction, heart failure, and pneumonia). The implications of this finding are that some characteristic of accreditation or characteristic of accredited hospitals is impacting clinicians' performance of the recommended processes of care. Although TJC hospitals did not show greater improvements in mean processes of care from 2007 to 2011 as predicted, TJC hospital performance levels appear to have already been higher in 2007 for accredited hospitals, and to such a level that making significant gains was not possible as performance scores were closer to 100% compared to non-accredited hospitals back in 2007.

Although hospitals accredited by The Joint Commission tend to perform the recommended processes of care at a higher rate than non-accredited hospitals, non-accredited hospitals are still performing these processes at a relatively high rate that is close in proximity to accredited hospitals. What facilitates accredited hospitals performing these processes at a higher rate could be attributed to a variety of things. It may be that accrediting organizations and the rigors of their review process makes hospital performance more transparent and of greater importance, and/or holds hospitals more accountable to providing patients care based on processes that have been found to improve a presenting condition.

Limitations

Considering that the process of care data is self-reported by hospitals, an evident concern is the accuracy of the data. Inaccuracies in reporting by either nurses/doctors on patient charts, or inaccuracies in the hospitals gathering and submitting of performance on processes of care could impact the results. Another limitation is that the data that is being utilized for this study does not take into account any patient factors that may influence the treatment a patient receives

(for example certain patients may not be able to receive the standard care and administration of certain processes of care because of individual patient factors).

Limited research has indicated that individual hospital characteristics impact the quality of care a hospital administers. Past research studies have indicated that certain hospital characteristics (being a teaching hospital, geographic region, rural status, profit status, and number of beds) may be associated with or impact the quality of care a hospital provides (Jha, Zhonghe, Orav, & Epstein, 2005). Not accounting for such hospital characteristics may have impacted the results of this study. They were not controlled in this study due to the limited research on what hospital characteristics influence the quality of care a hospital administers, and also the inability to obtain the necessary data of hospital characteristics. Costs for obtaining data on individual hospital characteristics was high, and resources in the public domain often did not include a practical means for linking hospital characteristic data to hospital performance data.

Another limitation of this study is the assumption that hospitals who were identified as having Joint Commission (TJC) accreditation in 2007 and 2011 maintained that status for the entire five-year period. It is possible, although unlikely given the organizational burden and time demands for applying for and receiving reaccreditation, that an organization may have not renewed their accreditation status for a length of time. A hospital may also have may have lost and then regained accreditation status during this time frame of interest.

Although performance measures are evidence based, they may not be the best measures of quality of care clinicians provide at a hospital. Although research supports the processes of care assessed in this study, and research has found that performing these processes will result in better patient outcomes, there may be other processes of care for these conditions that could better explain the quality of care administered. Processes that have the greatest impact on a

patient's condition and the reduction of patient mortality would theoretically be the best processes of care to assess. Accrediting organizations have refined their processes of care over the years as medicine has advanced, and it is possible that modifications or elimination of the processes assessed in this study could happen in the future.

Future Research

Future research may further investigate the relationship between Joint Commission accreditation status and clinicians' performance of process of care measures for acute myocardial infarction, heart failure, and pneumonia. Such research may be able to provide a partial explanation for the findings of this study, and why TJC hospitals perform processes of care at a significantly higher rate than occurs at non-accredited hospitals. Such findings may help identify which hospital characteristic variables to control for when assessing the influence of accreditation and the quality of care administered at hospitals which would provide a more accurate assessment of the influence that accreditation has on the quality of care and if processes of care are performed at hospitals. Hospital characteristics such as the number of clinicians, staffing dedicated to reporting, and the sophistication of technology for reporting may influence a hospitals ability to perform and document the processes of care that they provide to patients. Further analysis into such characteristics of hospitals, as mentioned above, may provide greater insight into what is influencing adherence to a clinician performing an evidence based process when treating patients, and what role accreditation has in impacting clinician's performance of such processes.

Research should also assess performance of the recommended processes of care and how these values change at TJC accredited hospitals over time. Such research may find that hospitals that seek TJC accreditation already perform processes of care at a higher rate. Research

assessing change in performance over time starting when a hospital first becomes accredited to the present time may also identify when changes in performance occur for a hospital that becomes accredited. It may be that significant changes occur within the first few years of accreditation and then numbers remain constant at a percent close to 100 that does not leave much room for a hospital to significantly improve up their performance scores.

Summary

This study sought to explore the quality of care administered to hospital patients and assess one factor that may be influencing the care given. Of interest in this study was assessing the role of accreditation and whether accredited hospital clinicians perform the recommended processes of care for a condition more often than clinicians at non-accredited hospitals. Of interest in this study was accreditation by The Joint Commission (TJC) and if hospitals preform processes of care for acute myocardial infarction, heart failure, and pneumonia at a higher rate at TJC accredited hospitals when compared to non-accredited hospitals. Also assessed was the change in performance of processes of care over a five-year period and whether larger gains in performance were achieved by accredited hospitals. Although TJC accredited hospitals reported a higher average administration of the processes of care for AMI, heart failure and pneumonia in 2011, TJC accredited hospitals did not report the largest gains in performance from 2007 to 2011 for all conditions of interest. Overall, accredited hospitals are more likely than non-accredited hospitals to perform the recommended processes of care for AMI, heart failure, and pneumonia patients.

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