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## **Patient Satisfaction and Nurse Communication Pre- and Posthospital Mergers and/or Acquisitions**

Shakeeya Sorrells  
*Walden University*

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# Walden University

College of Management and Human Potential

This is to certify that the doctoral study by

Shakeeya Sorrells

has been found to be complete and satisfactory in all respects,  
and that any and all revisions required by  
the review committee have been made.

Review Committee

Dr. Matt Frederiksen-England, Committee Chairperson, Health Sciences Faculty

Dr. Lee Bewley, Committee Member, Health Sciences Faculty

Chief Academic Officer and Provost  
Sue Subocz, Ph.D.

Walden University  
2025

Abstract

Patient Satisfaction and Nurse Communication Pre- and Posthospital Mergers and/or

Acquisitions

by

Shakeeya White Sorrells

MHA, Walden University, 2018

BBA, Limestone College, 2010

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Healthcare Administration

Walden University

February 2025

## Abstract

Amid continuing mergers and/or acquisitions (M&As) of their institutions, U.S. hospital leaders have found it challenging to maintain favorable patient satisfaction Hospital Consumer Assessment of Health Care Providers and Systems (HCAHPS) scores. The purpose of this quantitative, quasi-experimental study was to explore the correlation between patient satisfaction (identified as the “likelihood to recommend” metric) and “nurse communication” HCAHPS scores pre- and post-hospital M&As. Donabedian’s theoretical framework and triad model of structure, process, and outcomes within health care quality served as the foundation for the evaluation. HCAHPS and 2019 change of hospital ownership data were obtained from the Centers for Medicaid & Medicare Services. Utilizing hospital merger status and linear mean scores for the HCAHPS domains “likelihood to recommend” and “nurse communication”, data was analyzed by applying the ANCOVA method and regression of analysis. Research questions posed, sought to determine the possibility of correlation between “likelihood to recommend” and “nurse communication” when hospital mergers/acquisitions are involved. The assigned covariant consisted of pre-merger HCAHPS scores, with the dependent variable being comprised of post-merger HCAHPS scores. Non-merged hospitals were assigned as the control group for this analysis. Results indicated no statistical significance between the variables analyzed. This study is significant in that it may encourage awareness of the impact of M&As on patient satisfaction and nurse communication, encouraging trust and positive social change.

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## Dedication

I dedicate this work to my family and friends for their unwavering support during this doctoral journey. To my children, Dashaun, Devin, Danielle, and Destani, I hope that I have exhibited what faith in God, tenacity, and hard work manifests. Several family vacations I have had to break away to complete my studies, but you all remained patient and understanding throughout this process, and I love you. To my mom, your patience and encouragement means the world, and I hope that I have made you proud. Finally, to my late grandparents, know that you are missed daily. My greatest cheerleader, Ollie White (Granny), you always instilled in us the importance of education and determination, and I am eternally grateful for you. You will forever live in my heart.

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## Table of Contents

List of Tables.....	iv
List of Figures .....	vi
Section 1: Foundation of the Study and Literature Review .....	1
Background .....	2
Problem Statement.....	3
Purpose of the Study .....	4
Research Questions and Hypotheses .....	5
Theoretical Framework.....	7
Nature of the Study.....	8
Literature Search Strategy.....	9
Literature Search Framework.....	9
Associated Methodology Literature.....	10
Literature Review Related to Key Variables and Concepts.....	11
Donabedian’s Quality Framework.....	11
Hospital Mergers and Acquisitions.....	12
Patient Satisfaction.....	15
Cultural Differences.....	17
Definitions.....	19
Assumptions .....	19
Scope and Delimitations .....	20
Limitations .....	21

Significance .....	21
Summary and Conclusions.....	24
Section 2: Research Design and Data Collection.....	28
Research Design and Rationale .....	28
Methodology .....	31
Population.....	31
Sampling and Sampling Procedures .....	34
Instrumentation and Operationalization of Constructs .....	35
Threats to Validity .....	38
Ethical Considerations .....	38
Summary .....	39
Section 3: Presentation of the Results and Findings .....	41
Data Collection of Secondary Data Set .....	42
Results	43
Research Question 1: Likelihood to Recommend .....	43
Research Question 2: Nurse Communication.....	48
Summary .....	55
Section 4: Application to Professional Practice and Implications for Social	
Change.....	57
Interpretation of the Findings.....	59
Limitations of the Study.....	60
Recommendations.....	61

Implications for Professional Practice and Social Change .....	62
Professional Practice .....	62
Positive Social Change.....	63
Conclusion.....	64
References.....	66

## List of Tables

Table 1. Likelihood to Recommend Descriptive Statistics for Dependent Variable Pre-HCAHPS.....	44
Table 2. Likelihood to Recommend ANOVA Tests of Between-Subjects Effects for Dependent Variable Pre-HCAHPS.....	44
Table 3. Likelihood to Recommend Homogeneity Descriptive Statistics for Dependent Variable Post-HCAHPS .....	45
Table 4. Likelihood to Recommend Homogeneity Tests of Between-Subjects Effects for Post-HCAHPS.....	45
Table 5. Likelihood to Recommend Estimated Marginal Means-Group for Dependent Variable Post-HCAHPS .....	46
Table 6. Likelihood to Recommend ANCOVA Tests of Between-Subjects Effects Post-HCAHPS .....	47
Table 7. Nurse Communication Descriptive Statistics for Dependent Variable Pre- HCAHPS .....	49
Table 8. Nurse Communication ANOVA Tests of Between-Subjects Effects for Dependent Variable Pre-HCAHPS.....	50
Table 9. Nurse Communication Homogeneity Descriptive Statistics for Dependent Variable Post-HCAHPS .....	51
Table 10. Nurse Communication Homogeneity ANOVA Tests of Between-Subjects Effects Post-HCAHPS .....	51

Table 11. Nurse Communication Estimated Marginal Means-Group for Dependent

Variable Post-HCAHPS .....53

Table 12. Nurse Communication ANCOVA Tests of Between-Subjects Effects

Post-HCAHPS .....53

## List of Figures

Figure 1. Application of Donabedian’s Quality Framework to the Study.....	7
Figure 2. Giessner et al.’s Change in Job Satisfaction by Merger Status.....	22
Figure 3. Chesley’s Competing Values Framework.....	26
Figure 4. Likelihood to Recommend Profile Plot of Estimated Marginal Means of Post-HCAHPS .....	48
Figure 5. Nurse Communication Profile Plot of Estimated Marginal Means of Post- HCAHPS .....	54

## Section 1: Foundation of the Study and Literature Review

Over the past decade, many U.S. hospitals have been faced with the possibility of closing due to staff shortage, economic hardships, and so forth. These issues have caused an increase in hospital mergers and/or acquisitions (M&As), which causes abrupt environmental changes (Sofer, 2020). M&As can spawn changes in leadership, culture, job stability, processes, and structure. In this study, I sought to identify the impact of hospital M&As on patient satisfaction and nurse communication. Patient satisfaction is an important metric to analyze, being that the patient's voice is instrumental in improving quality of care as well as optimizing CMS reimbursement rates. When patients perceive their care as favorable, they are more likely to recommend services to others (Attebery et al., 2020). Patient satisfaction plays an intricate role in CMS reimbursement rates because quality metrics are used to determine the amount to reimburse hospitals for applicable services.

Nurse communication is a domain within the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey that assesses the patient's perception of communication with nurses; it is most critical in facilities during and after the significant changes a merger produces (Deerhake & O'Brien, 2020). When hospitals undergo M&As, patient satisfaction and nurse communication are likely affected. I conducted this study to identify whether these variables are indeed impacted and to what extent. Knowing the correlation between these variables may allow hospital leaders to be proactive with preliminary strategies while going through the merger process, fostering positive social change.

## **Background**

Over the past decade, there has been an increase in U.S. hospital M&As that raises questions about the impact on health care quality. Beaulieu et al. (2020) stated that the hospital industry has consolidated substantially during the past 2 decades and at an accelerated pace since 2010. The nature of mergers involves many variables that can make it difficult to forecast effectiveness, considering outcomes can be positive or negative. Transfer of leadership and clinical operations by the acquired hospital can contribute to a successful merger just as associated costs and diversion of resources and consolidation can contribute to problems during or after an M&A (Beaulieu et al., 2020).

Previous studies conducted on hospital M&As have focused on service pricing and clinical processes due to the lack of information about the effects on quality of care (Beaulieu et al., 2020). Another factor that is rarely discussed but influences overall patient satisfaction is the merging of cultures prior to and during M&As. Culture is noted as a key driver in the success or failure of M&As due to the influence one hospital may have over another (Chesley, 2020). Identifying differences early on can prevent a clash of cultures that has the potential to affect patient care and operations as well as patient satisfaction and nurse communication.

Metrics such as HCAHPS scores can aid leaders in identifying opportunities for strategic planning before and during hospital M&As. Although there is not one overall patient satisfaction score, the Likelihood to Recommend domain is often used as a general score as it captures overall patient satisfaction. This domain is an evidence-based performance indicator that captures overall patient perceptions and what patients will convey to others regarding their hospital experience (Kemp et al., 2023). Nurse communication is another domain included in the HCAHPS survey, which indicates the patient's perception of nurses' engagement. M&As can often lead to workflow disruptions and organizational changes that increase workloads and burdens for staff (RevCycleIntelligence, 2022). Health care leaders must be proactive with analyzing HCAHPS data before, during, and after the merger process to gauge effectiveness and identify gaps, to maintain a healthy culture for patients and staff.

### **Problem Statement**

As health care M&As increase, health care leaders are finding it difficult to maintain optimal patient satisfaction, including that related to nurse communication. Patient satisfaction metrics are essential to overall quality in that research shows that hospital quietness, nurse communication, and care transition positively affect patient experience ratings and the patient's likelihood to recommend the hospital (Kemp et al., 2023). Between 1990 and 2015, 2,748 consolidation transactions (horizontal mergers, acquisitions, other formal integration/alignment arrangements) took place involving U.S. hospitals and health systems (Attebery et al., 2020), prompting health care leaders to acknowledge and prepare for a drastic shift in operations and culture. Due to the impact

of patient satisfaction, along with published quality metrics and CMS reimbursement rates, it is vital for successful hospital M&As to be prioritized. Attebery (2020) noted that one patient's bad experience, and the resulting negative word of mouth, can cost a hospital between \$6,000 and \$400,000 in lost lifetime revenues.

Organizational culture is a contributing factor of what determines patient satisfaction and serves as a key driver for patients' recommendation of hospitals for services. Because of the significance of combining cultures and creating an overall optimal patient experience, Chesley (2020) emphasized the importance of prioritizing the alignment of cultures, over financial alignment. Cultural wars can impact the organization wherein by reputation and trust amongst staff. If not strategized properly, health care M&As can bring high levels of employee uncertainty that leads to distrust of the organization, resistance to the impending changes, dips in employee morale with behavior characterized by dysfunction, and high employee turnover (Chesley, 2020). There is limited research on the relationship between hospital M&As and their impact on patient satisfaction and nurse communication. More analysis and effective strategic planning are needed to improve patient satisfaction and nurse communication.

### **Purpose of the Study**

The purpose of this study was to evaluate the correlation between patient satisfaction and nurse communication HCAHPS scores pre- and posthospital M&As. Increased patient satisfaction and nurse communication have the ability to positively affect hospitals' reputation, which ultimately affects the bottom line. Kemp et al. (2023) noted that cultivating a care experience continuum that consists of patient-centered care

leads to higher ratings of patient experience as well as a greater likelihood of recommending the hospital. In enacting the Affordable Care Act, U.S. legislators sought to improve the quality of health care through the Partnerships for Patients initiative, forcing hospitals to improve their services or risk financial penalty when patients submit lower satisfaction scores (Hui-chuan Chen et al., 2020). The increase in hospital M&As has forced health care leaders to be cognizant of HCAHPS scores during transition phases to ensure a healthy culture. Sofer (2020) explained the rise in U.S. hospital M&As from 74 in 2020, to 92 in 2019; these significant shifts impact the work environment leaving many employees with feelings of burnout, likely to impact patient care. Patient satisfaction and nurse communication scores should be used as a metric before and after hospital ownership changes.

### **Research Questions and Hypotheses**

Researchers undertake quantitative analysis to interpret HCAHPS data pre- and posthospital mergers, followed by use of a quasi-experimental model to determine causality between an intervention and outcome (Kaeedi et al., 2023). The goal of this study was to identify the correlation between hospital M&As along with patient satisfaction and nurse communication. Research questions (RQs) provide a foundation for formal outcomes of research, which are hypotheses. Hypotheses are indicative of possible results that may or may not be expected regarding the relationship between groups (Barroga & Matanguihan, 2022). I formulated hypotheses to forecast the correlation between patient satisfaction and nurse communication, pre- and posthospital mergers. The following RQs and corresponding hypotheses were as follows:

RQ1: Is there a correlation between likelihood to recommend scores and hospital M&As?

$H_01$ : There is no correlation between likelihood to recommend scores and hospital M&As.

$H_a1$ : There is a correlation between likelihood to recommend scores and hospital M&As.

RQ2: Is there a correlation between nurse communication scores and hospital M&As?

$H_02$ : There is no correlation between nurse communication scores and hospital M&As.

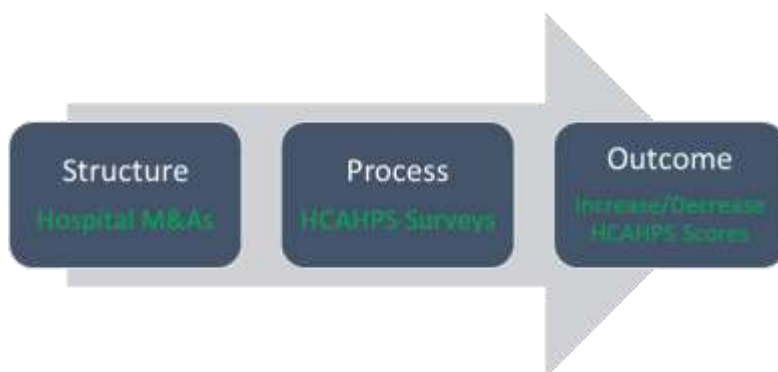
$H_a2$ : There is a correlation between nurse communication scores and hospital M&As.

## Theoretical Framework

Health care leaders are tasked with ensuring a healthy environment for patients and staff. Studies indicate that when employees are satisfied at work, they tend to perform better, which positively impacts the patient's experience. Chang et al. (2017) explained that job satisfaction of physicians and nurses has been found to affect the quality of care, patient satisfaction, and turnover. Avedis Donabedian is known as the founder of health care service and quality examination. His work provides a framework for understanding the interrelationship between health care organization structures, processes, and outcomes of care, as shown in Figure 1 (White et al., 2022). Donabedian (1980) explained that defined patient outcomes are affected by processes and structure, further impacting the science of health care, values, and ethics. Singh and Boyle (2020) agreed with Donabedian's model, further explaining that engaging with national audit and quality improvement initiatives and partaking in a culture of shared learning will give the opportunity to continue improve outcomes.

### Figure 1

*Application of Donabedian's Quality Framework to the Study*



The described triad ultimately influences quality metrics and performance, which are all vital to reimbursement rates, the bottom line, and hospital reputation. Donabedian (1980) defined outcome as “a change in a patient’s current and future health status that can be attributed to antecedent health care” (pp. 82–83). Donabedian’s framework correlates with this research due to the foundation of efficient processes and culture and their impact on patient outcomes. Culture is sometimes referred to as “the way an organization operates,” which encompasses components derived from patient satisfaction and nurse communication. I analyze these metrics to provide a baseline for pre- and postmerger success, as well as provide guidance on improvement strategies.

### **Nature of the Study**

Analyzing HCAHPS scores to determine patient satisfaction and nurse communication metrics requires a quantitative approach. Quantitative analysis is driven by RQs, formed hypotheses, and objectives. For this study, I gathered HCAHPS data from a secondary resource, the CMS database. These data were obtained via a company approved by CMS, Press Ganey. Attebery (2020) noted that research has shown the most influential factors affecting a patient’s satisfaction with an inpatient episode involve the interaction with physicians, nurses, and other staff members. Necessary hospital ownership data were also obtained from CMS’s hospital change in ownership database. Hospital ownership changes served as the independent variable and nurse communication and patient satisfaction as the dependent variables.

I used a quasi-experimental design to examine the relationship between hospital M&As along with the overall patient experience domain rating. The Likelihood to Recommend domain was examined to capture the patient's overall satisfaction rating, along with the Nurse Communication domain. Likelihood to recommend is based on Likert scale results, ranging from 0 to 5 with 5 being the highest score possible. From this data, percentile rankings and top box averages are calculated. For this study, I used top box as the metric analyzed to indicate the percentage of participants scoring the highest possible score for the likelihood to recommend variable. Kemp et al. (2023) found that hospital quietness, nurse communication, and care transition were positively associated with patient experience ratings and the patient's likelihood to recommend the hospital. This component serves as a vital component of hospitals' ability to serve communities while promoting positive health outcomes.

### **Literature Search Strategy**

I accessed the following databases from the Walden University Library: the university's Thoreau multi-database search tool, PubMed, EBSCOhost, Ovid, ProQuest, and the JAMA Network. Key terms applied for the search were *patient satisfaction* and *hospital mergers*. Narrowing down the key terms search provided detailed information about the study topic. Peer-reviewed articles were used, specifically those published within the past 5 years to maintain relevance.

### **Literature Search Framework**

The foundation of this study was the effects of patient satisfaction HCAHPS scores both pre- and posthospital M&As. I derived most of the literature for the study by

inputting *patient satisfaction AND hospital mergers OR hospital acquisitions* in my database searches. This search combination yielded the greatest number of results.

### **Associated Methodology Literature**

Researchers use quasi-experimental designs to demonstrate causality between an intervention and an outcome that can use both preintervention and postintervention measurements, estimating “treatment effects” that measure the causal effect of an intervention on an outcome of interest (Cookson et al., 2021). Atterberry et al. (2020) performed a quasi-experimental design study to analyze the correlation between patient experience HCAHPS scores, for merged and non-merging hospitals. Atterberry et al. used the Irving Levin Associates database of hospital M&As to identify those hospitals with a change in ownership. The American Hospital Association Annual Survey database provided hospital characteristics for coupling to determine the like hospitals that had undergone a change in ownership vs non merged like hospitals. HCAHPS scores were retrieved from the CMS database to provide metrics for patient satisfaction domains. Utilizing quantitative data to couple the hospitals into two distinct groups initiates the quasi-experimental analysis (Kaeedi et al., 2023).

Atterberry et al. (2020) utilized three dependent variables focused on nurse communication, physician communication, and staff responsiveness HCAHPS scores to compare within hospital groups with similar characteristics. Their first hypothesis was that hospitals that experienced a merger will be associated with lower patient experience ratings immediately following a merger (within the first 12 months). Their second hypothesis was that initial differences in patient experience ratings will dissipate over

time (36 months postmerger). Results indicated that HCAHPS scores were significantly higher amongst premerger hospitals compared to postmerger, with a  $p$  of less than .10. Hospital incompatibility served as a limitation warranting additional research regarding this topic. A similar approach was utilized for this study.

### **Literature Review Related to Key Variables and Concepts**

#### **Donabedian's Quality Framework**

I based this study on the health care quality framework of Avedis Donabedian, who is deemed the father of modern health care quality. Donabedian's (1980) quality model focuses on the triad of process, structure, and outcome being the key determinants influencing care (p. 78). Donabedian explained processes in health care as the activities that take place between patients and practitioners, which are dependent upon health care, values, and ethics. Health care values and ethics serve as the foundation for the manner in which health care establishments operate, influencing patients' perception of care. Chelsey (2020) stressed the importance of health care organizational culture and its impact on processes and patient outcomes, stating that M&As have been found to have more of an impact on the social life and structure of individuals than other major life events such as buying a house or undergoing foreclosure, or even the death of a close friend. This further supports Donabedian's quality theory and the correlation of process, structure, and outcomes.

Donabedian (1980) explained the outcome component of the triad as an indirect method of measuring quality that indicates change in a patient's current and future health status that can be attributed to antecedent health care (p. 79). According to Donabedian, one cannot judge changes in health status as quality of care until other causes of the change have been examined. HCAHPS scores are metrics adopted by all health care facilities participating in CMS programs to aid in identifying gaps in the triad model to encourage improvement and positive outcomes (Sofer, 2020).

The last component of the triad model is structure. Donabedian (1980) explained structure as the physical setting, organizational policies, financial resources, the tools and resources available to providers of care, and much more (p. 82). Structure can be understood as the environment in which care is being provided; it is also relevant to quality in that it increases or decreases the probability of superior performance. These physical aspects associated with health care play just as important of a role as processes because they both impact patient outcomes and perception of care. Sofer (2020) confirmed the correlation of a changing health care environment and the effect on patients' perception of care. Sofer's research revealed that restructuring and mergers were associated with increased nurse burnout and less job satisfaction, which can ultimately impact patients' outcomes and satisfaction. Although Donabedian advocated the triad model, he also emphasized the goal to use it as a guide and not as a law.

### **Hospital Mergers and Acquisitions**

Research has shown an increase in hospital M&As over the last several decades. Mariani et al. (2022) noted the growing number of merged health care organizations,

especially in the United States and in Europe, within the past 3 decades. These changes in hospital ownership were attributed to Medicare policy changes from the 1980s to the evolution of managed care in the United States during the 1990s. In the United States, in 1994, more than 10% of the hospitals participated in some form of mergers, reaching a peak of 2,497 mergers in 2003; similarly, in the United Kingdom, between 1997 and 2006 more than 100 mergers were started (Mariani, 2022). Regardless of country, health care mergers have historically been initiated in response to health care structure and policies and economic factors. As hospitals continue to consolidate, price negotiations with insurance companies have become the driving force in recent years. Considering the surge in hospital M&As beginning in 2010, Beaulieu et al. (2020) suggested that consolidation of the hospital market has led to higher negotiated prices with private insurers possibly influencing improvements or deterioration in quality care.

Although health care M&As have increased over the past several years, M&As trends remained during the COVID-19 pandemic. Researchers predicted a decline in M&As during the pandemic but their forecasts proved to be inaccurate. Hospital change in ownership or dealmaking in 2020 proved to be consistent with recent historical ranges of activity, with several transformational deals announced and performed during the pandemic (RevCycle Intelligence, 2022). According to RevCycle Intelligence (2022), “mega mergers” involve organizations that each have at least \$1,000,000,000 in annual revenues.

Atrium Health, Wake Forest Baptist Health, and Harrington Healthcare-UMASS Memorial Healthcare are examples of such mega mergers that proceeded during this time frame, according to RevCycle Intelligence (2022). In the first case, two North Carolina hospitals merged to form a robust academic medical system worth \$11,000,000,000. Atrium Health and Wake Forest Baptist Health combined in 2022 to include a second medical school and 42 hospitals and 1,500 care locations throughout North Carolina, South Carolina, Georgia, and Virginia. The two entities elected to keep their legacy names as part of the new brand name Atrium Health Wake Forest Baptist. According to the system's website (2020), "the unified name reflects who we are together as Atrium Health - one academic health system, jointly committed to transforming health through compassionate, equitable care, discovery and innovation and leading-edge medical education" (para. 1).

RevCycle Intelligence (2022) data show that Harrington Healthcare System and UMass Health merged in the summer of 2021, creating an expanded UMass Health entity. The system's health care leaders vowed to build on their existing relationships with employees and the community to ensure a healthy culture while promoting exemplary health care outcomes. Eric Dickson, president and CEO of UMass Memorial Health, was quoted as saying that

Harrington and UMass Memorial Health are closely aligned when it comes to our organization cultures and values: We deeply value our employees, have a strong commitment to providing the highest quality care to our patients and are invested

in giving back to the communities we serve. (UMASS Memorial Health, 2021, para. 1)

### **Patient Satisfaction**

Patient satisfaction is a metric used for health care organizations to gauge their perception of care. It is indicative of meeting patients' care expectations. According to Reynolds et al. (2022), "patient satisfaction" and "patient experience" are used interchangeably; however, patient satisfaction is more subjective and focuses on patients' expectations being met. Patient satisfaction is captured through Press Ganey's HCAHPS surveys, which analyze score ratings based on patients' answers to the surveys. HCAHPS scores are critical to health care leaders in that they provide metrics to analyze patients' perception of care while providing financial incentives for favorable results. Kemp et al. (2023) stated that CMS integrates the results from HCAHPS into performance-based compensation systems for hospitals, as patient experience accounts for 25% of a hospital's value-based purchasing score.

Patient satisfaction initiatives involve strengthening communication while decreasing patients' risk for injury (Reynolds et al., 2022). Nurse communication is referenced within the HCAHPS survey to determine patients' perception of how well nurses communicated during their hospital stay. Patient-centered care is a model that encourages fostering relationships between patients and clinicians. Obtaining information as simple as what the patient prefers to be called, as well as important information about the patient, can help enrich interactions between the patient and the provider (Kemp et al. 2023).

Tate et al. (2023) researched the effects of clinical leadership and organizational culture on patient satisfaction and health outcomes and determined that authentic leadership and a healthy organizational culture drives positive patient satisfaction and health outcomes. Similar to Donabedian's theory, my study considers health care structure, processes, and outcomes to be key indicators of patient satisfaction and quality. Clinicians' performance is influenced by their environment and established culture, in which leaders are tasked with driving optimal patient satisfaction scores. Nurses identify competence in leadership, such as authentic leadership, as a key factor in supporting quality care as well as access to appropriate resources and infrastructure to carry out their work (Tate et al., 2023). These characteristics heavily impact nurses' behavior and communication while engaging with team members and patients. Although optimal HCAHPS scores is a goal, the strategy should be authentic and patient-centered to achieve the desired outcomes. Tate and partners noted that "hospitals with developmental/group cultures and higher scores on authentic leadership exhibit clearer pathways between quality improvement practices, employee authority to resolve care issues, ultimately leading to higher patient satisfaction" (2023).

Tate and colleagues (2023) utilized primary resources to analyze the correlation between hospital culture, authentic leadership, and patient satisfaction/outcomes. They found that a healthy culture promoting employee engagement and learning opportunities yielded improvements in patient satisfaction. The intensity of effects on patient satisfaction was greatest for the high-indicators group with results of statistically

significant increases in patient satisfaction ( $\beta = 0.392$ ). A limitation noted was possible bias due to a cross-sectional study, limiting causal claims.

### **Cultural Differences**

Merging any number of entities requires incorporating processes, values, structures, staff, and so forth to achieve a common goal. Organizational goals typically are based on improved efficiency, economic opportunities, and advancement. Ernst et al. (2020) explained that the aim of mergers is often efficiency improvements and a better integration of care, their reality is complex, and the issues of stress and conflict for the hospital staff involved tend to have been neglected by health care decision-makers and managers. Cultural analyses can be a tool used to survey the perspectives of clinical staff, to promote a healthy culture shift while maintaining patient-centered quality care.

Due to the impact that cultural discord could have on a health care organization, culture is considered the most important component during a merger. Chesley (2020) asserted that C-suites, boards, clinical staff, and support staff of all entities must align on everything from mission and vision to workplace relationships and routines. Ensuring alignment and trust improves employee morale and motivates staff to perform their best, hence increasing communication and patient satisfaction. Failure to foster a cohesive culture has been found to have grave effects on outcomes, to the extent of inducing merger syndrome. Merger syndrome exists when individuals experience a culture shock, reduced job performance, resistance to change, job insecurity, and general feelings of anger and fear as a result of an M&A (Chesley, 2020). To mitigate merger syndrome, leaders should prioritize culture analyses and planning during the M&A journey to savor

employee satisfaction while maintaining patient-centered care. Sofer (2020) suggested that organizational and unit leaders would be wise to carefully assess work relations, work responsibilities, and the availability of resources, all of which may be sources of dissatisfaction.

M&As also have a significant impact on communities in which impacted health care organizations exist. Diana Mason, senior policy professor at George Washington University of Nursing, stated that “too often, the ‘efficiencies’ that the M&As promise lead to assembly-line care that ignores the local needs and customs of those served by a local hospital” (as cited in Sofer, 2020, para. 8). The 2010 merger between two Arizona health care systems, Sierra Vista Regional and Carondelet Catholic Health, posed legal problems due to culture differences. A woman was denied the option to terminate her pregnancy while in the midst of miscarrying and was sent 80 miles away to a different facility for care. The issue of disparate clinical cultures may in fact transcend organizations' internal customs and extend to a clash of social and religious values (Sofer, 2020). This case caused Sierra Vista to end its affiliation with Carondelet Health as a result of culture differences. Values such as these greatly influence communities and where potential patients decide to seek care, also impacting perception of care. Anticipating differences in organizational cultures, Kacik (2021) recommended that leaders do the following: increase transparency, conduct discussions around operations and community impact, identify cultural differences, and establish concrete steps to integrate.

## Definitions

The following terms are used in this study:

*Centers for Medicare & Medicaid Services (CMS)*: A federal agency responsible for providing and regulating quality health care within the United States (Devereaux et al., 2023).

*Culture*: A common set of values holding an organization together (Ernst & Schleiter, 2020).

*Hospital change of ownership (CHOW)*: A data set that provides information on individual and organizational ownership interest and managerial control associated with the buyer and seller organizations, role of the owner, association date, address of the organizational owner, and other ownership details (Centers for Medicare and Medicaid Services, 2023).

*Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)*: A survey, sent randomly to patients postdischarge, that consists of 29 questions centered on the quality of care received and patient satisfaction (Devereaux et al., 2023).

*Merger and Acquisition (M&A)*: The integration of firms (Novosol, 2022).

*Nurse communication*: An HCAHPS composite score that measures the extent to which nurses display courtesy and respect to patients (Attebery et al., 2020).

## Assumptions

Three assumptions are associated with this study. The first is that sample hospitals being fairly compared, are based on like characteristics. Next, is that HCAHPS data provided proved to be accurate and comparable utilizing the same time period. Lastly,

M&A dates completed the change in ownership transaction, omitting those that were announced only.

### **Scope and Delimitations**

Data collection in this study is provided utilizing secondary resources, for example, HCAHPS data and hospital change in ownership data from the CMS database. The scope of this study is to evaluate the correlation between patient satisfaction and nurse communication HCAHPS scores pre- and posthospital M&As. Sofer (2020) found that restructuring and mergers were associated with increased nurse burnout and less job satisfaction, with possible impact to the nurse communication question. Researchers also explained the importance of patient experience as a critical aspect of evaluating merger's impact on consumer welfare and the potential value of monitoring HCAHPS after a merger (Atterbery, 2020).

During this study delimitations were identified. The first delimitation classifies the study as a quasi-experimental study, correlating patient satisfaction and nurse communication pre- and posthospital M&As. Next, primary data and control groups were inessential in correlating the dependent and independent variables associated with the study. Third, this study is delimited by the amount of research around the impact of patient satisfaction and nurse communication during hospital M&As. Attebery (2020) notes that, no studies to date have assessed whether mergers affect patient experiences of care. Lastly, generalization could pose as a delimitation as Beaulieu's study (2020) reflect average effects of M&As, which might obscure the benefits or harms of some M&A transactions. The framework of this study was based on Donabedian's quality theory and

the impact that processes, structure, and culture have on health outcomes. Analyzing HCAHPS data of pre- and postmerger hospitals will further explore the relationship between the variables studied.

### **Limitations**

Several limitations were noted as it relates to this study. Many of the merger events that occurred in 2009 were eliminated from the study because there were no HCAHPS ratings for 3 years prior (Attebery et al., 2020). The next limitation is that all domains of quality and patient satisfaction were not analyzed. Third, the number of completed hospital ownership changes available for analyses. Lastly, the competitive significance of each ownership transaction was not quantified (Beaulieu et al.,2020).

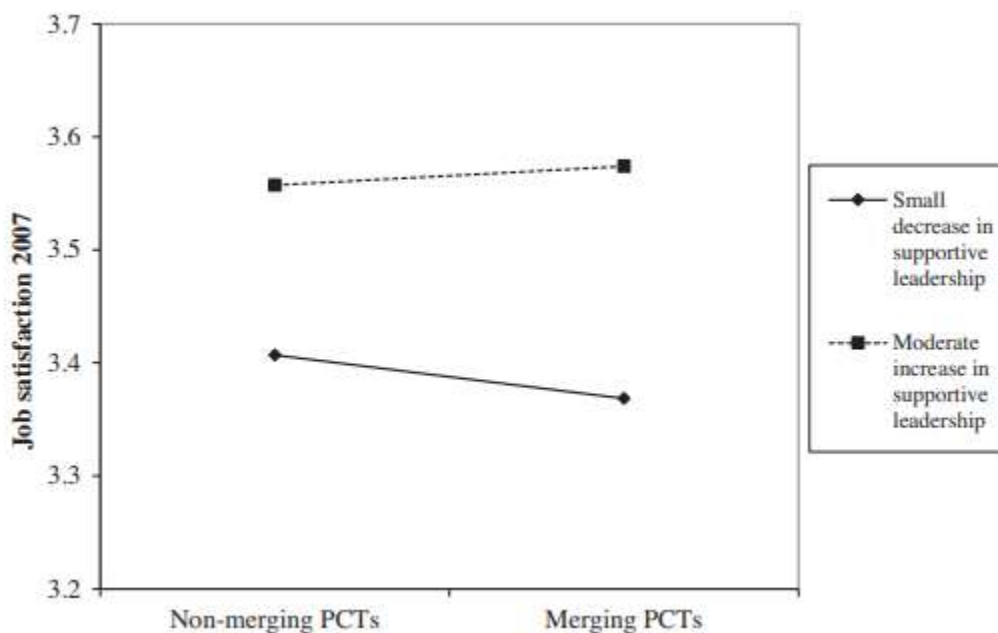
### **Significance**

This study's significance is to encourage awareness around the importance of patient satisfaction and nurse communication and the impact that M&As have on these variables. As hospitals continue to change ownership, health care leaders must remain vigilant around maintaining a healthy and safe environment. According to Geissner et al. (2022) past studies on the impact of M&As have largely focused on individual-level effects, with early research showing that employees tend to suffer from higher levels of stress and depression and lower levels of job satisfaction during large-scale organizational changes. However, this is not always the case in that many organizations experience success post-M&As. Geissner et al. asserted that the key to a successful M&As is the human component serving as a key driver. The shift in culture and processes are believed to impact staff members by inducing feelings of uncertainty,

distrust, stress, and increased absenteeism which all could negatively influence patient care and satisfaction. Figure 2 is a line graph comparing perceived job satisfaction of patient care techs involved in hospital mergers and not involved in mergers.

**Figure 2**

*Giessner et al. 's Change in Job Satisfaction by Merger Status*



Giessner et al. (2023). The impact of supportive leadership on employee outcomes during organizational mergers: An organizational-level field study. *The Journal of Applied Psychology*

*Note.* PCT = patient care tech.

Performing culture assessments on all facilities involved, prior to M&As, is valuable preparation towards ensuring a successful merger; yielding optimal quality metrics. Beaulieu et al. found that M&As have an impact on patients' perceptions of care, through their difference in difference design of hospitals researched. Patient outcome metrics were compared to determine the extent of impact. Their research discovered that

acquisition was associated with a progressive differential decline in performance on the patient-experience measure during the post transaction period, analogous to a fall from the 50th percentile to the 41st percentile in the distribution of performance among control hospitals and was consistent across the component measures of the patient-experience composite (Beaulieu et al., 2020). Although the study determined effects associated with hospital change in ownership and patient experience, there were limitations noted. One regarding the possibility of spillover effects of M&As on control hospitals which could offset estimates of acquisition effects. For this reason, it is imperative that hospitals' CHOW, pre- and posttransactions, are reviewed and analyzed. Insight on this type of data could prove beneficial for hospital ownership changes in the future.

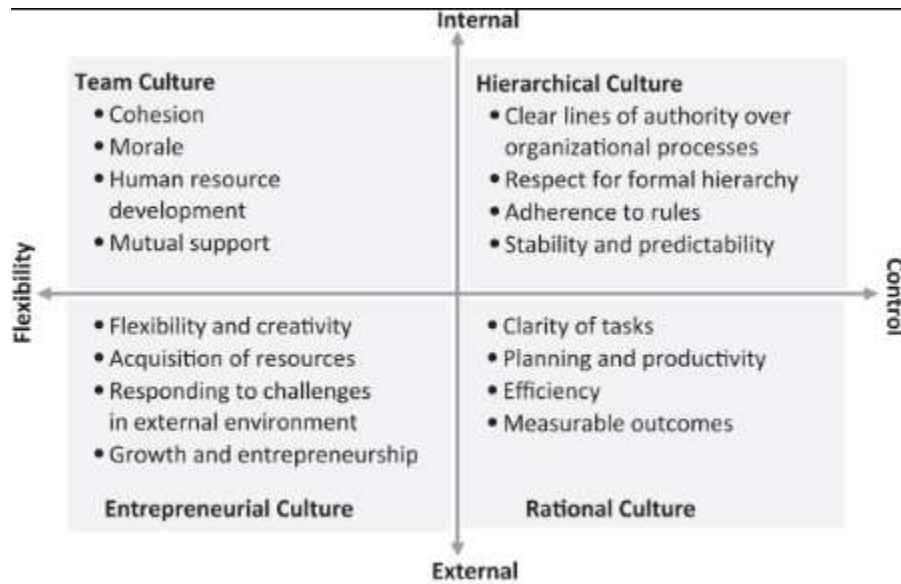
## Summary and Conclusions

Given the increased number of hospital M&As, health care leaders must be intentional about aligning processes and culture to influence positive patient outcomes and satisfaction. Sofer (2020) reported that M&As have seen a dramatic rise, from 74 in 2010 to a record 115 in 2017; during M&As organizational and unit leaders would be wise to carefully assess work relations, work responsibilities, and the availability of resources, all of which may be sources of dissatisfaction and burnout. Due to the number of M&As, many researchers have attempted to determine the correlation between these transactions, patient satisfaction, and nurse communication. Chesley (2020) noted that due to the current trends in hospital M&As, leaders of health systems must carefully weigh and measure the current organizational culture prior to the consummation of the merger, seeking to understand differentiation within and between the merging organizations. Researchers have discussed culture, tiered leadership, and leadership styles as variables impacting patient satisfaction.

Atterbery et al. (2020) utilized quasi-experimental analysis to correlate the relationship between patient experience HCAHPS scores for merged and non-merged hospitals alike. Using secondary data sources, Atterbery et al. found an association between hospitals that experienced a merger and slower growth in HCAHPS scores for two of the four HCAHPS domains (overall and nurse communication) when compared to matching hospitals that did not merge. Limitations such as inadequate geographical pairing of hospitals, and lack of data for the study period suggest the need for further research.

Kemp et al. (2023) referenced the importance of patient experience not just for the implications associated with hospital reimbursement, but also the concept of fostering patient-centered care while encouraging quality and safety. Some researchers have asserted that authentic leadership and hospital culture influence patient outcomes. Tate et al. (2023) explained that having both high authentic leadership and developmental or group hospital cultures are essential for quality improvement practices to enhance the quality of care and patient satisfaction. Authentic leadership and engaging hospital cultures are noted as key drivers for quality patient satisfaction by supporting employee morale. Creating a thriving environment for clinicians increases nurse communication, yielding a positive nurse/patient relationship.

Chesley's (2020) empirical study of employee attitudes towards merging hospital transactions and established culture focused on cultural assessments, employee tiers, and effectively merging cultures. Chesley concluded a statistically significant difference between the current cultures of the health systems prior to the merger with significant differences in the cultural perceptions of Tier 1 employees and Tier 2 employees. Both Chesley and Sofer (2020) suggested the competing values framework as a tool for measuring organizational culture in preparation for M&As. Chesley's competing values framework is shown in Figure 3.

**Figure 3***Chesley's Competing Values Framework*

Chesley, C. G. (2020). Merging organizational cultures in healthcare: Lessons from the USA in differentiation among tiers in a health system merger. *International Journal of Healthcare Management*

Changes to hospital environments are impactful; therefore, it is important for health care leaders to analyze data pre- and posthospital M&As. Deerhake and O'Brien (2021) explained that during times of organizational change, retention issues can intensify, related to increased job uncertainty, and decreased two-way communication for clinical staff. Monitoring HCAHPS scores may allow health care leaders to maintain a pulse on the correlation between hospital ownership changes, patient satisfaction, and nurse communication. When communication decreases amongst clinical staff, it is imperative that a mitigation plan is utilized to preserve optimal patient satisfaction. Being that patient satisfaction encompasses the patient's experience, it is imperative that health care stakeholders know the extent to which major changes influence daily operations and patients' perception of care. Collecting HCAHPS data enables merging leaders to make evidence-based decisions regarding strategic planning, organizational emphases, and culture integration activities that can have the most meaningful impact, providing the best outcomes for patients in servicing communities (Chesley, 2020).

## Section 2: Research Design and Data Collection

The purpose of this study was to evaluate the correlation between patient satisfaction and nurse communication HCAHPS scores pre- and posthospital M&As. The increase in hospital M&As has forced health care leaders to be cognizant of HCAHPS scores during transition phases to ensure a healthy culture (Sofer, 2020). Sofer (2020) also noted the rise in U.S. hospital M&As from 74 in 2020, to 92 in 2019; these significant shifts impact the work environment leaving many employees with feelings of burnout, likely to impact patient care. To better understand the depth of impact and correlation between nurse communication, patient HCAHPS scores, and hospital M&As, further analysis must be conducted.

### **Research Design and Rationale**

The quantitative research method is utilized in this study to analyze HCAHPS data in relation to hospital M&As. Quantitative research focuses on the collecting and studying data, while tracking trends, relationships, and changes. Quantitative research should investigate cause-effect relationships between corporate social responsibility initiatives and societal outcomes, (Du et al., 2023). Utilizing this approach serves as basis for answering the following RQs:

RQ1: Is there a correlation between likelihood to recommend scores and hospital M&As?

$H_0$ 1: There is no correlation between likelihood to recommend scores and hospital M&As.

$H_{a1}$ : There is a correlation between likelihood to recommend scores and hospital M&As.

RQ2: Is there a correlation between nurse communication scores and hospital M&As?

$H_{02}$ : There is no correlation between nurse communication scores and hospital M&As.

$H_{a2}$ : There is a correlation between nurse communication scores and hospital M&As.

I used a quasi-experimental design to further assess causal relationships between the dependent and independent variables within research. The independent variable in this study is M&A transactions, with dependent variables nurse communication and patient satisfaction HCAHPS scores. Time passed between pre- and post-M&As serves as the consistent variable being influenced by hospital M&As. Secondary resource, the CMS CHOW database, validated which hospitals completed M&A transactions. Information on individual and organizational ownership interest and managerial control associated with the buyer and seller organizations, role of the owner, association date, address of the organizational owner and other ownership details, (CMS, 2023).

Provider HCAHPS data within the CMS database includes Medicare affiliated facilities, demographic information, and quality related metrics based on survey responses. The HCAHPS survey is administered to random patients upon discharge to provide a standardized survey instrument and data collection methodology for measuring

patients' perspectives on hospital care, (CMS, 2023). HCAHPS is comprised of 29 questions, divided into domains, to measure patient satisfaction.

For this study, nurse communication and willingness to recommend hospital were used as metrics to correlate with hospital M&As. Nurse communication consists of four questions, while willingness to recommend hospital serves as a single question, (CMS, 2023). Linear scoring is used to determine the final linear mean score. Adjustments at the quarterly level before transformation into a 0-100 linear-scaled score, are performed prior to publication on Hospital Compare. Kemp et al. (2023) studied the significance of nurse communication, likelihood to recommend hospitals, and other performance indicators as it relates to patient outcomes. They found that nurse communication is a significant predictor of a hospital's patient experience rating and the likelihood to recommend the hospital.

Attebery et al. (2020) applied a quasi-experimental design to examine the relationship between hospital mergers and four different (HCAHPS) domain rating, while comparing the patient experience scores of merger hospitals to those of propensity score-matched unmerged hospitals. This study incorporated quasi-experimental design by correlating the nurse communication and likelihood to recommend HCAHPS scores, both pre- and postmerger transactions compared to non-merger hospitals. The basis of quasi-experimental design is to analyze the association between the independent and dependent variables identified. Quasi-experiments or natural experiments are common when utilizing a control group– for example, difference-in-differences (Did) modeling, (Cookson, 2021).

## **Methodology**

### **Population**

The target population of this quasi-experimental study consists of five randomly selected hospitals that participated in a complete M&A during 2019, analyzing the HCAHPS scores of likelihood to recommend and nurse communication, compared to facilities that had not participated in a merger. The five hospitals were derived from the CMS's CHOW database, which is a public database with hospital demographic and transaction information. Data sets are updated periodically in the system on a weekly, monthly, quarterly, or annual basis, which is identified within the "data update frequency" field.

Another secondary data source used was CMS's HCAHPS data gathered from patient surveys provided by Press-Ganey. Press-Ganey is a CMS approved human experience tool that surveys patients' experiences producing quality data for transparency (Press Ganey, 2023). Being that these data were publicized for hospital comparison reasons, no permissions were needed. The HCAHPS and CHOW data platforms are managed by the U.S. Centers for CMS providing frequently updated data dictionaries concerning different topics. According to CMS (2023) This site gives direct access to the CMS official data that are used on the Medicare Care Compare website and directories. The goal is to make data readily available in open, accessible, and machine-readable formats. Associated HCAHPS data were collected for all surveyed patients of CMS participating facilities and providers.

The secondary sources providing hospital change in ownership details, ie. dates and buyer/seller information, provides the independent variable of M&A status. Dependent variable data were supplied by CMS HCAHPS data, specifically for nurse communication and overall patient satisfaction (likelihood to recommend) data. Based on patient survey responses, CMS applies the linear mean process to weigh score results to publish (CMS, 2023). Numbers are assigned to patient responses to generate a linear mean score. Linear mean scores assign sequential values from 1 to k for ordered response with k response categories. For example, never, sometimes, usually, and always are assigned initial values of 1, 2, 3, and 4. Some responses, such as those for 0-10 global ratings, are already on a numerical scale (CMS, 2023). Linear mean scores produce the most reliable estimates and the greatest statistical power.

Nurse communication was evaluated utilizing the criteria under “Your Care from Nurses.” The questions included “How often did nurses treat you with courtesy and respect?”, “How often did nurses listen carefully to you?”, “How often did nurses explain things in a way you could understand?”, and “After you pressed the call button, how often did you get help as soon as you wanted it?” The likelihood of recommending the hospital was captured through two questions, both of which were analyzed on a 10-point and 4-point Likert scale. The first question was “How would you rate this hospital during your stay on a scale of 0-10? 0 indicating the worst and 10 indicating the best?” The second question was “Would you recommend this hospital to your family and friends?” The response options for the second question were definitely no, probably no, probably yes, and definitely yes. Responses to these questions are 1 (*never*), 2 (*sometimes*), 3 (*usually*), and 4 (*always*).

The HCAHPS linear mean scores published by CMS on Hospital Compare represent a rolling 4-quarter average for each hospital. These averages are weighted proportionately by the number of eligible patients seen by a hospital in each quarter of the reporting period (CMS, 2023). I compared both categorical and numeric variables in this study, identifying the analysis of covariance (ANCOVA) as an efficient method of correlation, (Ford, 2020). The categorical data consists of pre- and postmerged hospitals and hospitals that experienced no change in ownership, serving as the control group. Associated numerical data were identified as HCAHPS linear mean scores for nurse communication and likelihood to recommend. SPSS is used to input this information for analysis.

Prior to inputting data into SSPS, data must be cleaned to ensure relevancy and omit any duplication that may exist. Reviewing data for duplicate and unnecessary data, along with standardizing data fields helps to ensure data alignment and proficient analysis. The goal of data cleaning is to make certain the data set is as complete and accurate as possible before data analysis (National Cancer Institute Center for Biomedical Informatics & Information Technology, 2023).

### **Sampling and Sampling Procedures**

In an effort to perform data correlation between variables, the sampling process assists with arranging data for accuracy. During the hospital selection process, secondary data were obtained from the CMS CHOW database. Five hospitals, Vanderbilt University Medical Center, Aurora Medical Center, Scenic Mountain Medical Center, Presence Saint Joseph Hospital–Chicago, and Decatur Memorial Hospital, were randomly selected. To remain consistent with the five randomly selected merged hospitals, five hospitals that did not participate in CHOW, were randomly selected from an article in Becker’s Review (Ellison, 2019); Loyola University Medical Center, Palos Community Hospital, Sanford Medical Center, Gundersen Health System, and Centura Health. These facilities had announced mergers in 2019; however, the transactions never happened.

Stratified sampling, a probability sampling method, is best suited for this selection process in that the target population consists of U.S. hospitals that experienced CHOW in 2019. The selection process was then stratified based on those transactions that were closed, announced, or cancelled. In this instance, the five hospitals were randomly selected from the CHOW database for 2019, and five hospitals were randomly selected from the Becker's Review canceled transactions. Stratified sampling involves random selection within predefined groups useful for determining aspects that are highly correlated with what is being measured, (Qualtrics XM, n.d.).

### **Instrumentation and Operationalization of Constructs**

To review hospital CHOW status, I obtained data from CMS's CHOW database (<https://data.cms.gov/provider-characteristics/hospitals-and-other-facilities/hospital-change-of-ownership-owner-information/data>). Data obtained from the CMS database is collected from the Provider Enrollment, Change, and Ownership System, which maintains ownership changes consisting of facility names and ID numbers, date of request, location, and leader information.

Another secondary resource used in this study was CMS's HCAHPS database (<https://data.cms.gov/provider-data/dataset/dgck-syfb>). This database leverages patient experience scores from hospital surveys to calculate patients' perception of care. This portal provides a standardized survey instrument and data collection methodology for measuring patients' perspectives on hospital care, (CMS, 2023). The CHOW database is useful in tracking hospital ownership transactions on or after January 1, 2016, (CMS, 2023). Researchers and health care leaders can utilize this public database to verify hospital ownership changes.

### ***Operationalization for Each Variable***

I analyzed merged hospital status and HCAHPS data for 2015 to 2022, with pre-merged HCAHPS scores from 2015 to 2018 and postmerged HCAHPS data from 2019 to 2022. Merged hospitals serve as the independent variable, while likelihood to recommend and nurse communication HCAHPS scores serve as the dependent variables. Merged/non-merged hospital status is categorical data indicative of “Yes or No” values, classifying merged hospitals versus the control group of hospitals. HCAHPS score data for likelihood to recommend and nurse communication for pre- and postmerger metrics is scale data, on a scale from 0-100, with 100 being the highest score. The date of HCAHPS scores is also noted as a scale unit of measure.

### ***Data Analysis Plan***

Utilizing SPSS Version 29, the data needed for this study was uploaded and analyzed for correlation based on the RQs presented. The HCAHPS and CHOW data were extracted from CMS's database and exported via Excel spreadsheet in preparation for upload to SPSS. Before uploading data to SPSS, data cleaning and validation was performed. Data irrelevant to my study was removed and data that may have displayed as "Not Available" was not included in the SPSS data analysis process and treated as unknown. The researcher must decide how to treat missing values in light of business or domain knowledge. To ease training time and increase accuracy, removing blanks or null data from a data set is best practice, (IBM, 2024). Clean data were analyzed utilizing the ANCOVA research method within SPSS to evaluate the following RQs and hypotheses:

RQ1: Is there a correlation between likelihood to recommend scores and hospital M&As?

$H_01$ : There is no correlation between likelihood to recommend scores and hospital M&As.

$H_{a1}$ : There is a correlation between likelihood to recommend scores and hospital M&As.

RQ2: Is there a correlation between nurse communication scores and hospital M&As?

$H_02$ : There is no correlation between nurse communication scores and hospital M&As.

*H<sub>a2</sub>*: There is a correlation between nurse communication scores and hospital M&As.

### **Threats to Validity**

Several threats may be considered when performing research. Identifying and addressing these threats as soon as possible are essential to substantial research. An external threat that may impact this study is sampling bias. When performing stratified random sampling, researchers may allow prior knowledge to influence sample selection, which increases the risk for selection bias when strata are defined (Qualrics XM, n.d.). Another threat within this study is maturation of HCAHPS data. Data were limited by time when comparing 5 years pre- and posthospital merger HCAHPS scores. There was adequate data to perform analysis from 2014-2018, but not enough to conduct analysis from 2019-2023. To mitigate this issue, data collection was minimized to 4 years for accuracy.

### **Ethical Considerations**

This study consisted of analysis of CMS's HCAHPS scores and CHOW data available via the CMS HCAHPS and CHOW data portals. Data is submitted by healthcare facilities and uploaded to these portals for quality reporting purposes. No contact was made with patients surveyed, only data derived from the noted surveys within the public CMS portals, were analyzed. Walden University's IRB approval was obtained on June 4, 2024, with the assigned approval number 06-04-24-0673492.

## Summary

Correlating likelihood to recommend and nurse HCAHPS scores, pre- and posthospital mergers, will give an understanding of the manner in which these variables are related. Given the increase in hospital M&As, health care leaders can use this data to ensure that adequate preparation is made to ensure effective transitions. Sofer (2020) emphasized the need for health care leaders to be cognizant of HCAHPS scores during transition phases to ensure a healthy culture.

I used the quantitative research method to analyze HCAHPS scores and hospital CHOW transactions by assessing the linear mean score for likelihood to recommend and nurse communication pre- and posthospital M&As. Using the established RQs and a quasi-experimental design, I explored the causal relationships between study variables. Nurse communication is a significant predictor of a hospital's patient experience rating and the likelihood to recommend a hospital (Kemp et al., 2020). CMS's HCAHPS database is another secondary resource used to extract linear mean scores for the dependent variables likelihood to recommend and nurse communication. According to CMS (2023), linear mean scores produce the most reliable estimates, yielding greater statistical power.

Analyzing both the categorical and numerical variables using the ANCOVA correlation method allows researchers to analyze covariance used to test the interaction effects of categorical variables on a continuous dependent variable, (Ford, 2020). Categorical data sampling is achieved via random sampling from the CMS CHOW secondary data provided. To mitigate bias, the researcher must be intentional about randomly selecting hospital facilities from the list regardless of predetermined knowledge. Ethical documentation was not required, being that data used was derived from public secondary sources. Collecting, cleaning, and arranging appropriate data was essential to the study. The next step will consist of encapsulating collected data in preparation for analysis and hypothesis testing.

### Section 3: Presentation of the Results and Findings

The purpose of this quantitative study was to explore the correlation between HCAHPS domains, patient satisfaction - likelihood to recommend and nurse communication HCAHPS scores pre- and posthospital M&As. This study is based on the Donabedian framework, a theory of quality in health care. Within this section the data, results, and a summary of findings are explained. Statistical analysis was conducted after obtaining the data, to determine descriptive statistics and analytical results to correlate the relationship between merged hospitals and HCAHPS scores. The associated RQs and hypotheses were as follows:

RQ1: Is there a correlation between likelihood to recommend scores and hospital M&As?

$H_01$ : There is no correlation between likelihood to recommend scores and hospital M&As.

$H_{a1}$ : There is a correlation between likelihood to recommend scores and hospital M&As.

RQ2: Is there a correlation between nurse communication scores and hospital M&As?

$H_02$ : There is no correlation between nurse communication scores and hospital M&As.

$H_{a2}$ : There is a correlation between nurse communication scores and hospital M&As.

### **Data Collection of Secondary Data Set**

To understand the correlation between HCAHPS scores and hospital M&As, I obtained data for 2015 to 2022 for control hospitals. For hospitals that experienced a merger event in 2019, data were obtained 4 years premerger event and 4 years postmerger event. HCAHPS secondary data were obtained from the CMS database, along with hospital merger event data being obtained from CMSs CHOW database.

I used SPSS to conduct the ANCOVA. This method was used for the analysis of pre- and post-HCAHPS data as it relates to hospital M&As. Data variables consisted of hospital names, groups, and pre- and post-HCAHPS linear mean scores. Forty total hospital instances were analyzed, including those that merged in 2019, along with those that did not participate in a merger. Random sampling was used to select from the CHOW database the hospitals that participated in mergers in 2019. Stratified sampling was used to extract those hospitals that completed a merger and those that did not.

The hospitals are categorized by groups, control and merged. Control group represents random hospitals that may have been set to merge in 2019 but didn't. The merged group represents those hospitals that participated in an M&A in 2019. Pre-HCAHPS data are comprised of linear mean scores for two different HCAHPS domains, nurse communication and likelihood to recommend, from 2015 to 2019. Post-HCAHPS data utilizes the same data for a time period of 2019 to 2022. Validating assumptions ensure that the covariate meets the requirements for ANCOVA. Pre-HCAHPS can be statistically significantly different across levels of the independent variable, but there can't be a differentiation between control and merged groups on pre-HCAHPS.

After running ANCOVA on the dependent variable pre-HCAHPS and the independent variable group, there was no significance on control and pre-HCAHPS. This warranted the analysis of the second assumption for homogeneity of regression. Variables are set the same as ANCOVA but replacing the dependent variable with post-HCAHPS while assigning pre-HCAHPS as the covariate, keeping group as the independent variable. The univariate model is adjusted to a custom model multiplying group by pre-HCAHPS. The non-significant result meets the homogeneity of regression, allowing for the final ANCOVA analysis.

## **Results**

### **Research Question 1: Likelihood to Recommend**

RQ1: Is there a correlation between likelihood to recommend scores and hospital M&As?

$H_0$ 1: There is no correlation between likelihood to recommend scores and hospital M&As.

$H_a$ 1: There is a correlation between likelihood to recommend scores and hospital M&As.

Descriptive Statistics

Table 1 depicts the HCAHPS linear mean scores for overall patient satisfaction HCAHPS domain, likelihood to recommend. The same 40 hospital instances are applicable, with 20 in the control group and 20 in the merged group. The statistically significant difference between the control and merged groups were analyzed to answer the RQs. The control and merged groups on the post-HCAHPS dependent variable is

based on controlling the pre-HCAHPS value. Initially, ANOVA testing was performed assigning pre-HCAHPS values as the dependent variable with the 2 groups defined as fixed factors. Table 2 refers to the assessment of the tests of between-subjects effects with a significance of .124 for the group source, indicating no statistically significant difference between control and merged on the pre-HCAHPS scores.

**Table 1**

*Likelihood to Recommend Descriptive Statistics for Dependent Variable Pre-HCAHPS*

Group	<i>M</i>	<i>SD</i>	N
Control	90.35	2.777	20
Merged	88.60	4.122	20
Total	89.48	3.580	40

*Note.* HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

**Table 2**

*Likelihood to Recommend ANOVA Tests of Between-Subjects Effects for Dependent*

*Variable Pre-HCAHPS*

Source	Type III SS	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	Partial eta squared
Corrected model	30.625 <sup>a</sup>	1	30.625	2.479	.124	.061
Intercept	320231.025	1	320231.025	25926.875	<.001	.999
Group	30.625	1	30.625	2.479	.124	.061
Error	469.350	38	12.351			
Total	320731.000	40				
Corrected total	499.975	39				

*Note.* ANOVA = analysis of variance; HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems

<sup>a</sup>  $R^2 = .061$  (adjusted  $R^2 = .037$ ).

### ***Homogeneity of Regression***

Assumption that assigns post-HCAHPS as the dependent variable, group as the independent variable, and pre-HCAHPS as the covariate to calculate ANCOVA. In this instance a custom model is used to multiply groups by pre-HCAHPS. Table 3 illustrates the descriptive statistics for homogeneity of regression. Table 4 illustrates test of between-subjects effects multiplying group by pre-HCAHPS to yield a significance of .160. This significance value indicates no significance between the variables and meets the homogeneity of regression.

**Table 3**

*Likelihood to Recommend Homogeneity Descriptive Statistics for Dependent Variable*

*Post-HCAHPS*

Group	<i>M</i>	<i>SD</i>	<i>N</i>
Control	88.55	3.268	20
Merged	87.65	4.987	17
Total	88.14	4.111	37

*Note.* HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

**Table 4**

*Likelihood to Recommend Homogeneity Tests of Between-Subjects Effects for Post-*

*HCAHPS*

Source	Type III <i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Corrected model	451.041 <sup>a</sup>	3	150.347	31.545	<.001
Intercept	.025	1	.025	.005	.943
Group	9.670	1	9.670	2.029	.164
Pre-HCAHPS	360.073	1	360.073	75.548	<.001
Group * Pre-HCAHPS	9.842	1	9.842	2.065	.160
Error	157.283	33	4.766		
Total	288017.000	37			
Corrected total	608.324	36			

*Note.* HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

<sup>a</sup>.  $R^2 = .741$  (adjusted  $R^2 = .718$ ).

### **ANCOVA**

The initial homogeneity setup is used for this analysis, replacing a full factorial model instead of a custom. Table 5 displays the estimated marginal mean values comparing the control group value of 88.027 to the merged group value 88.263, at the covariate pre-HCAHPS value of 89.84 (see also Figure 4). Table 6 shows a comparison between both groups, yielding a significance of .752, causing the groups to not be statistically significant. Partial eta squared explains about .03% movement in the post-HCAHPS scores. The output of tests of between subjects is based on controlling the pre-HCAHPS values. There is not a significant difference between the groups on the post-HCAHPS. This analysis failed to reject the null hypothesis.

**Table 5**

*Likelihood to Recommend Estimated Marginal Means-Group for Dependent Variable*

*Post-HCAHPS*

Group	<i>M</i>	<i>SE</i>	95% CI	
			<i>LL</i>	<i>UL</i>
Control	88.027 <sup>a</sup>	.499	87.013	89.041
Merged	88.263 <sup>b</sup>	.542	87.162	89.363

*Note.* HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems;

CI = confidence interval; LL = lower limit; UL = upper limit.

<sup>a</sup> Covariates appearing in the model are evaluated at the following values: Pre-HCAHPS = 89.84.

<sup>b</sup> Covariates appearing in the model are evaluated at the following values: Pre-HCAHPS = 89.84.

**Table 6**

*Likelihood to Recommend ANCOVA Tests of Between-Subjects Effects Post-HCAHPS*

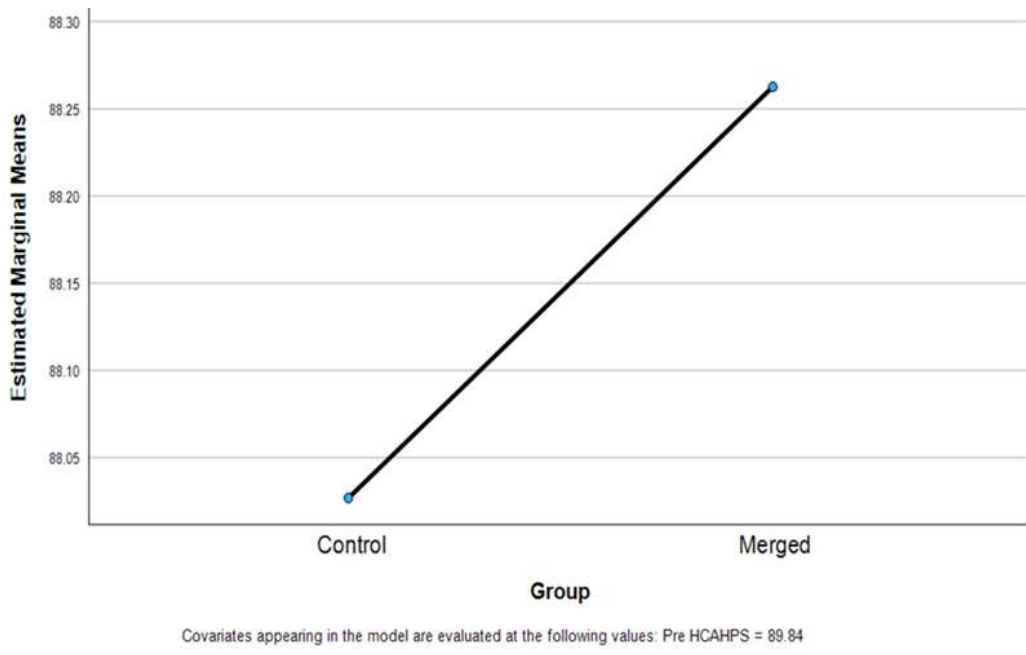
Source	Type III SS	df	MS	F	p	Partial eta squared
Corrected model	441.200a	2	220.600	44.879	<.001	.725
Intercept	.678	1	.678	.138	.713	.004
Pre-HCAHPS	433.708	1	433.708	88.234	<.001	.722
Group	.497	1	.497	.101	.752	.003
Error	167.125	34	4.915			
Total	288017.000	37				
Corrected total	608.324	36				

*Note.* ANCOVA = analysis of covariance; HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

<sup>a</sup>  $R^2 = .725$  (adjusted  $R^2 = .709$ ).

**Figure 4**

*Likelihood to Recommend Profile Plot of Estimated Marginal Means of Post-HCAHPS*



*Note.* HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

### **Research Question 2: Nurse Communication**

RQ2: Is there a correlation between nurse communication scores and hospital M&As?

$H_0$ 2: There is no correlation between nurse communication scores and hospital M&As.

$H_a$ 2: There is a correlation between nurse communication scores and hospital M&As.

### *Descriptive Statistics*

Table 7 depicts the HCAHPS linear mean scores for nurse communication, which are observed values. Of the 40 hospital instances participating in this study, 20 consists of the control group and 20 are included in the merged group. The statistically significant difference between the control and merged groups were analyzed to answer the proposed RQs. The control and merged groups on the post-HCAHPS dependent variable is based on controlling the pre-HCAHPS value. Initially, analysis of variance (ANOVA) testing was performed assigning pre-HCAHPS values as the dependent variable with group defined as fixed factor(s), independent variable. Table 8 refers to assessment of the tests of between-subjects effects, displaying a significance of .196 for the group source, indicating no statistically significant difference between control and merged on the pre-HCAHPS scores. This passes the first assumption stated with RQ2.

**Table 7**

*Nurse Communication Descriptive Statistics for Dependent Variable Pre-HCAHPS*

Group	<i>M</i>	<i>SD</i>	<i>N</i>
Control	92.05	1.432	20
Merged	91.35	1.899	20
Total	91.70	1.698	40

*Note.* HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

**Table 8**

*Nurse Communication ANOVA Tests of Between-Subjects Effects for Dependent Variable*

*Pre-HCAHPS*

Source	Type III SS	df	MS	F	p
Corrected model	4.900 <sup>a</sup>	1	4.900	1.732	.196
Intercept	336355.600	1	336355.600	118897.79	<.001
				3	
Group	4.900	1	4.900	1.732	.196
Error	107.500	38	2.829		
Total	336468.000	40			
Corrected total	112.400	39			

*Note.* ANOVA = analysis of variance; HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

<sup>a</sup>  $R^2 = .044$  (adjusted  $R^2 = .018$ ).

### ***Homogeneity of Regression***

Assumption that assigns post-HCAHPS as the dependent variable, group as the independent variable, and pre-HCAHPS as the covariate to calculate ANCOVA. In this instance a custom model is used to multiply groups by pre-HCAHPS. Table 9 illustrates the descriptive statistics for homogeneity of regression. There were three missing postmerger participants, with 17 of the 20 being accounted for. One hospital did not report nurse communication HCAHPS scores for 2020 or 2022; another missed the same data for 2020. SPSS omitted these three values from the post-HCAHPS data to keep the remaining data reported for these hospitals. According to (Popovich, 2024) missing data

can occur for numerous reasons, such as respondents neglecting or refusing to answer certain questions, survey administration errors, or data entry mistakes. Table 10 illustrates test of between-subjects effects multiplying group by pre-HCAHPS to yield a significance of .217. This significance value indicates no significance between the variables and meets the homogeneity of regression.

**Table 9**

*Nurse Communication Homogeneity Descriptive Statistics for Dependent Variable Post-HCAHPS*

Group	<i>M</i>	<i>SD</i>	<i>N</i>
Control	91.00	1.622	20
Merged	90.88	1.933	17
Total	90.95	1.747	37

**Table 10**

*Nurse Communication Homogeneity ANOVA Tests of Between-Subjects Effects Post-HCAHPS*

Source	Type III <i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Corrected model	39.635 <i>a</i>	3	13.212	6.205	.002
Intercept	19.196	1	19.196	9.017	.005
Group	3.338	1	3.338	1.568	.219
Pre-HCAHPS	28.916	1	28.916	13.582	<.001
Group * Pre-HCAHPS	3.376	1	3.376	1.586	.217
Error	70.257	33	2.129		
Total	306143.000	37			
Corrected total	109.892	36			

*Note.* ANOVA = analysis of variance; HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

<sup>a</sup>  $R^2 = .361$  (adjusted  $R^2 = .303$ ).

### *ANCOVA*

The initial homogeneity setup is used for this analysis, replacing a full factorial model instead of a custom. Table 11 displays the estimated marginal mean values comparing the control group to the merged group, 90.858 to 91.049 (see also Figure 5). Estimated marginal means serve as a prediction, calculating coefficients from the linear model to yield more accurate results while controlling for the covariate. Table 12 shows a comparison between both groups, yielding a significance of .701, causing the groups to not be statistically significant. Partial Eta Squared explains about .04% movement in the post-HCAHPS scores. The output of tests of between subjects is based on controlling the pre-HCAHPS values. There is not a significant difference between the groups on the post-HCAHPS. The analysis did not support rejection of the null hypothesis.

**Table 11**

*Nurse Communication Estimated Marginal Means-Group for Dependent Variable Post-HCAHPS*

Group	<i>M</i>	<i>SE</i>	95% CI	
			<i>LL</i>	<i>UL</i>
Control	90.858 <sup>a</sup>	.331	90.186	91.531
Merged	91.049 <sup>b</sup>	.359	90.319	91.779

*Note.* HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

<sup>a</sup> Covariates appearing in the model are evaluated at the following values: pre-HCAHPS = 91.81.

<sup>b</sup> Covariates appearing in the model are evaluated at the following values: pre-HCAHPS = 91.81.

**Table 12**

*Nurse Communication ANCOVA Tests of Between-Subjects Effects Post-HCAHPS*

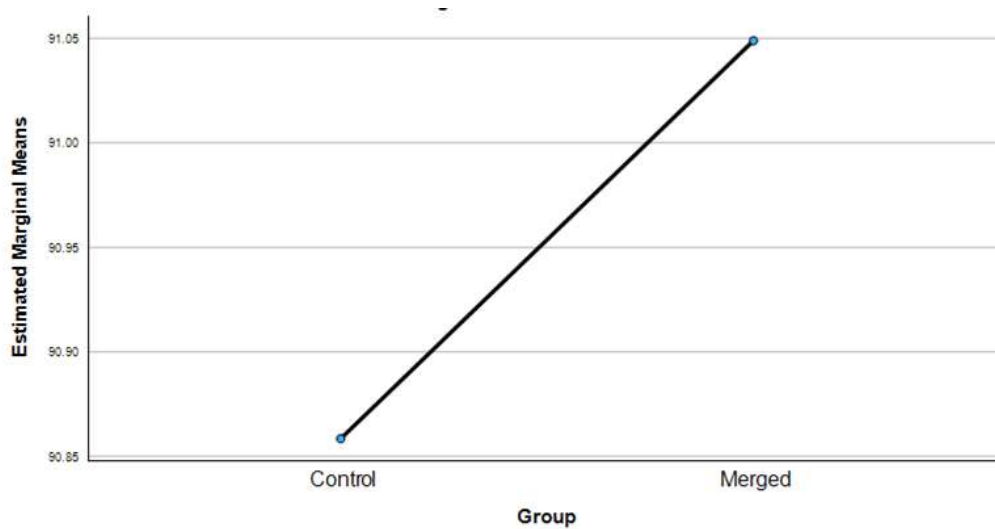
Source	Type III SS	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P</i>	Partial eta squared
Corrected model	36.258 <sup>a</sup>	2	18.129	8.371	.001	.330
Intercept	16.423	1	16.423	7.583	.009	.182
Pre-HCAHPS	36.131	1	36.131	16.683	<.001	.329
Group	.325	1	.325	.150	.701	.004
Error	73.634	34	2.166			
Total	306143.000	37				
Corrected total	109.892	36				

*Note.* ANCOVA = analysis of covariance; HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

<sup>a</sup>  $R^2 = .330$  (adjusted  $R^2 = .291$ ).

**Figure 5**

*Nurse Communication Profile Plot of Estimated Marginal Means of Post-HCAHPS*



*Note.* The covariates shown in the model were evaluated with pre-HCAHPS equal to 91.81. HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems.

### Summary

In this section, I explained the results of the analysis of the correlation between hospital mergers and nurse communication and likelihood to recommend HCAHPS scores. 40 hospital instances were sampled, including five control and five merged hospitals comparing HCAHPS scores from 2015-2022. Three hospital data entries were not provided for post-HCAHPS scores, therefore they were not considered during analysis. ANCOVA method was used with this study to analyze the differences between the assigned groups, control and merged, while controlling for the covariates. Initial analysis on the dependent variable pre-HCAHPS scores and the independent variable group revealed no significance on the control group and pre-HCAHPS scores. The second assumption for homogeneity of regression was performed, replacing the dependent variable with the post-HCAHPS scores, and assigning pre-HCAHPS scores as the covariate.

This analysis produced final significance numbers that were .701 for nurse communication and .752 for likelihood to recommend. These numbers are well above the .05 threshold of significance, indicating no correlation between variables. The null hypothesis for RQ1 failed, indicating no correlation between merged hospital instances and likelihood to recommend HCAHPS scores. The null hypothesis for RQ2 also failed, indicating no correlation between the merged hospital instances and nurse communication HCAHPS scores.

Being aware of potential impacts of hospital mergers and patient satisfaction are intricate to patient outcomes and the trust factor of health care facilities within communities. Chesley (2020) noted that hospital characteristics are important when considering a merger within any industry as subversion or lack of cultural fit can undermine the entire M&A process. Ensuring mergers are performed while monitoring patient satisfaction data serves as a proactive approach to cultivating cultures that encourages healing in safe and pleasant environments. In Section 4, I will elaborate on the importance of monitoring these variables and applying this information within health care environments.

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

Patient satisfaction serves an intricate role in health care quality and reimbursement rates as established by CMS. As health care mergers began to rise, focus was placed on ensuring that quality measures remain favorable during these major transitions. Sofer (2020) attributes the rise in mergers to factors such as the shift toward value-based reimbursement prompted by the passage of the Affordable Care Act in 2010 and the Medicare Access and CHIP Reauthorization Act in 2015, diminishing hospital margins, and record-high health care spending. These elements force health care leaders to strategize methods that serve in the best interest of health care organizations and the communities being served.

The purpose of this study was to examine the correlation between patient satisfaction scores and hospital mergers. The Donabedian framework was used as foundation for analyzing health care quality and outcomes as it relates to patient satisfaction and hospital mergers. Attebery (2020) noted that no researchers to date had assessed whether mergers affect patient experiences of care. This omission is problematic because patient experience is a core component of a hospital's value proposition. This study served as a significant analysis to explore what had not been thoroughly studied in the past, the correlation between patient satisfaction HCAHPS data and hospital merger transactions. I assessed CMS's HCAHPS data for the domains, likelihood to recommend and nurse communication, for the time period between 2015 and 2022 for 40 hospital instances including control hospitals. ANCOVA analysis determined that there was not a significant correlation between likelihood to recommend and nurse communication HCAHPS score for the hospital instances studied.

### **Interpretation of the Findings**

Descriptive analysis and homogeneity of regression was performed using the ANCOVA method of analysis. In an attempt to answer the first RQ around the correlation between likelihood to recommend HCAHPS and merged hospital instances, the analysis found no significance between the variables. The initial ANOVA test identified the test of between-subject effects significance to be .124, which is well above the threshold of significance. The homogeneity of regression significance for these variables was .160, indicating no significance. The final ANCOVA analysis displayed a decrease in the control group versus the merged hospital instances, with a significance of .752, which is above the threshold of significance. This allows us to accept the null hypothesis for the first RQ, noting no correlation between likelihood to recommend HCAHPS scores and hospitals that merged.

In an attempt to answer the second RQ around the correlation between nurse communication HCAHPS scores and merged hospital instances, the analysis found no significance between the variables. The initial ANOVA test identified the test of between-subject effects significance to be .196, which is well above the threshold of significance. The homogeneity of regression significance for these variables was .217, indicating no significance. The final ANCOVA analysis displayed a decrease in the control group versus the merged hospital instances, with a significance of .701 which is above the threshold of significance. This allows us to accept the null hypothesis for the second RQ, noting no correlation between nurse communication HCAHPS scores and hospitals that merged.

### **Limitations of the Study**

CMS HCAHPS and CHOW data served as the secondary data sources for this study. This data aids the federal government in setting quality reimbursement rates and benchmarking. Regulatory agencies also use CHOW data to determine impacts on hospital mergers and health outcomes. In 2021, the American Hospital Association updated its analysis of hospital transactions and found that M&As were associated with a 3.3% reduction in operating expenses between 2009 and 2019 (Bailey, 2022). Although the data were derived from what has been deemed a trusted source, there were some limitations identified.

Due to the time frame for data maturity, the HCAHPS scores could only be analyzed through 2022. This lag time allows hospitals to upload their data and undergo the review and publishing process for transparency and information purposes. HCAHPS linear mean scores, which are closely related to publicly reported “top-box,” “middle-box,” and “bottom-box” scores. Linear mean scores incorporate the full range of survey response categories into a single metric for each HCAHPS measure (Hospital Consumer Assessment of Healthcare Providers and Systems, 2024).

Missing hospital instances during analysis also serves as a limiting factor. The missing instances were missing completely at random, data missing not because of a specific value (Kaeedi, 2023). Missing completely at random is considered unbiased data due to randomness. The best method for approaching this type of data is to omit the values during analysis is listwise deletion. Listwise deletion is preferred among statistical analysis software in that it produces unbiased estimates and conservative results (Kaeedi, 2023).

### **Recommendations**

The HCAHPS data obtained from the CMS secondary source, was comprised of only two domains from the patient satisfaction survey. Analyzing additional domains such as; physician communication may contribute to a better understanding of the correlation between patient satisfaction and hospital merger impact. Researchers suggest that monitoring hospital culture during and after hospital CHOW is essential to successful transactions. Analyzing all domain HCAHPS scores can give a broader perspective into patients' perspectives around hospital culture and care. Including the patient's voice by analyzing free-text feedback could also serve as a more personal contribution of experiences. I would recommend including additional data, such as other HCAHPS domains, to broaden this study. Although the likelihood to recommend HCAHPS score is noted to serve as an overall patient satisfaction score comprised of the patient's experience in general, additional data could support the correlation between the impact of hospital ownership changes and patient satisfaction.

### **Implications for Professional Practice and Social Change**

Although this study has indicated no significant correlation between hospital mergers and patient satisfaction, it presents the opportunity to explore additional data to ensure successful CHOW transactions as it relates to culture and patient satisfaction.

#### **Professional Practice**

CMS HCAHPS and CHOW data served as the foundation for secondary data analysis with this study. Both databases are utilized universally to quantify quality metrics for transparency, comparison, and reimbursement. HCAHPS results have been publicly available since 2008 and is used in the value-based purchasing program is designed to financially incentivize acute-care hospitals to improve performance on several quality measures (Chen et al., 2020). The CMS secondary databases used in this study provided the necessary data to analyze HCAHPS linear mean scores both pre- and postmergers, while capturing the hospitals that changed ownership. There may be an opportunity to improve the lag time for publishing HCAHPS scores, enabling data to mature in a shorter time frame. If the HCAHPS data had been collected and published for 2023, I would have been able to include it in this study. More efficient reporting could assist health care leaders by improving the time span of Medicare reimbursement and implementation of quality initiatives.

### **Positive Social Change**

This study provides insight that could be used to improve the health care environment during M&As. Awareness of HCAHPS score pre- and posthospital change in ownership provides a proactive concept of a successful transition. Health care leaders should be engaged with their hospitals' HCAHPS status to ensure that patients are receiving the best care regardless of changes. Although hospital change in ownership can yield many benefits such as greater purchasing power and increased opportunity for the acquisition of expensive equipment, negative perceptions can be introduced. Impaired patients' perception of quality and satisfaction along with employees' satisfaction should be monitored by reviewing HCAHPS scores to gauge patients' perspectives (Cerezo-Espinosa de Los Monteros, 2021). Being aware of patients' perspectives and their needs gives health care leaders the information needed to provide necessary services, which can build trust.

According to Ernst & Jensen Schleiter (2020), while the aim of these mergers is often efficiency improvements and a better integration of care, their reality is complex, and the issues of stress and conflict for the hospital staff involved tend to have been neglected by health care decision-makers and managers. Ensuring trust among patients and employees assures patients that they matter during a time of uncertainty and major change. Performing culture and value analyses along with monitoring HCAHPS scores serves as the basis for maintaining a conducive culture, particularly during a major change. This allows leaders to remain connected with the community and evoke social change, amongst patients and families being served.

## Conclusion

Causality in this study was initiated by hospital CHOW followed by the outcome of patient satisfaction and nurse communication scores post-M&A. Changes to hospital environments are impactful, therefore, it is important for health care leaders to analyze data pre- and posthospital M&As. Deerhake and O'Brien (2021) noted that during times of organizational change, retention issues can intensify, related to increased job uncertainty, and decreased two-way communication for clinical staff. Monitoring HCAHPS scores may allow health care leaders to maintain a pulse on the correlation between hospital ownership changes, patient satisfaction, and nurse communication.

I used difference-in-difference analysis to compare data from secondary data sources to determine the relationship between the variables being studied. CMS's CHOW and HCAHPS databases provided hospital ownership and patient satisfaction scores to compare pre- and postmerger outcomes. According to Alibrandi et al. (2023), HCAHPS surveys are the tools through which it is possible to quantify the consumer's experience. Data collection of HCAHPS scores, pre- and posthospital mergers, were obtained for selected facilities that merged in 2019. Nurse communication and likelihood to recommend were the domains analyzed to capture HCAHPS scores from 2015-2022. Pre-merger scores were 2015-2018 while postmerger scores served as 2019-2022. After collecting this data and inputting it into the SPSS database to run ANCOVA analysis, I determined that there was no statistical significance identified between hospital mergers and patient satisfaction.

I analyzed nurse communication HCAHPS scores with the dependent variable identified as post-HCAHPS scores, producing a significance number of .701 for the tests of between-subject effects. This value being well above the .05 significance threshold, indicates the likelihood of no significant relationship between variables performing the ANCOVA method. Likelihood to recommend HCAHPS scores were analyzed with the dependent variable identified as post-HCAHPS scores, producing a significance number of .752 for the tests of between-subject effects. This value being well above the .05 significance threshold, indicates the likelihood of no significant relationship between variables performing the ANCOVA method.

Although this study determined there is not a statistically significant correlation between hospital mergers and patient satisfaction, it can only benefit health care leaders to be aware of this data when contemplating an M&A. Being that patient satisfaction encompasses the patient's experience, it is imperative that we know how major changes influence daily operations and patients' perception of care (Mariani, 2022). Acting in a proactive manner can ensure patient satisfaction by building trust not only with patients but also employees during transitions. This effort poses the opportunity to serve the community and contribute to the greater good of establishing quality patient-centered care.

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