

2023

# The Hospital Consumer Assessment of Healthcare Providers and Systems and Central-Line-Associated Bloodstream Infections

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# Walden University

College of Health Sciences and Public Policy

This is to certify that the doctoral dissertation by

Mary Kerich

has been found to be complete and satisfactory in all respects,  
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the review committee have been made.

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Walden University  
2023

Abstract

The Hospital Consumer Assessment of Healthcare Providers and Systems  
and Central-Line-Associated Bloodstream Infections

by

Mary Kerich

MHA, Pfeiffer University, 2013

BSN, Queens University of Charlotte, 2010

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health Services

Walden University

December 2023

## Abstract

Central-line-associated bloodstream infections (CLABSIs) are common healthcare-associated infections (HAIs) contributing to extended hospital stays, morbidity, mortality, and healthcare costs. In 2011, the Centers for Medicare and Medicaid Services implemented the Hospital Value-Based Purchasing initiative, which links acute care hospitals' payments to quality performance. A gap in the literature existed regarding the relationship between hospital characteristics, patient experience, and CLABSI rates. This quantitative study aimed to explore the relationship between patient experience scores reported by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) and CLABSI standardized infection ratio (SIR) in nonprofit acute care hospitals in the United States. Three domains of HCHAPS were selected for the study as a proxy for patient safety. Donabedian's structure-process-outcome framework guided the study. The study data was gathered from the American Hospital Directory and Hospital Compare website. Random sampling was completed. A sample size of 77 nonprofit acute hospitals with a complete dataset was included in the study. A standard multiple linear regression analysis showed that nurse communication and room cleanliness statistically correlated with CLABSI rates ( $p < .001$ ). No significant correlation was found for staff responsiveness ( $p < .864$ ). The research findings emphasize quality care through reducing microbial contamination and effective communication. Future research on the correlation between nurse-to-patient ratio, patient experience, and outcome is recommended. The study promotes positive social change by providing empirical information to improve quality, clinical processes, patient experience, and outcome measures.

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## Dedication

To the Kerichs—

Henry, Victor Baraka, Mary Wa Kerich, and beloved late Mark Marvin.

To my dear husband, Dr. Henry Kerich, you are the best! I love and honor you.

Thank you for providing a covering, speaking the Word of God, and sowing into my life.

To our dearest son Victor, thank you for encouraging me to pursue my dreams. I cherish

your love. Your hugs are reassuring, “Mom, this is your choice.” Son, you deserve the

best. Together, we make a difference! To our beloved son, late Mark Marvin, you will

always be in my heart. I was inspired to pursue this PhD degree in honor of your legacy.

With God, all things are possible.

## Acknowledgments

First, I want to acknowledge Almighty God for Divine favor and empowering grace to complete this study. The extraordinary grace and support from family and friends were designed to bring the correct alignments to accomplish my goals in life. Thank you, family, friends, and the faith community, for being there for me. Peace and joy always!

Secondarily, this challenging journey would not have been possible without my committee members, who individually and collectively introduced me to a new level of patience and resilience. Special thanks to the entire committee for providing premier guidance and actionable feedback throughout this dissertation journey. To my chair, Dr. Harold Griffin, thank you for your support and mentorship. I appreciate your time and expertise for value add. My second committee member, Dr. Gudeta Fufaa, thank you for your proficiency and prompt feedback. Finally, I would like to thank Dr. Susan Richins, my URR, my academic advisor, and my program director for the support provided during my study at Walden University.

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## Chapter 1: Introduction to the Study

### **Introduction**

Central-line-associated bloodstream infection (CLABSI) is a universal healthcare-associated infection (HAI) that contributes to increases in healthcare costs, prolongs patients' hospital stays, and increases morbidity and mortality (Centers for Disease Control and Prevention [CDC], 2016). The CDC's National Healthcare Safety Network (NHSN) provides healthcare facilities with surveillance methods to identify and track HAIs. A multifaceted approach to CLABSI prevention includes evidence-based practice (EBP), protocols, legislation, and mandated reporting (Whittington et al., 2017; Woodward & Umberger, 2016). The Centers for Medicare and Medicaid Services (CMS) instituted Hospital Value-Based Purchase (HVBP) as a payment system to reward providers for the quality of care they provide (Richter & Muhlestein, 2017).

Hospital control, affiliation with academic medical centers, size, and geographical location are associated with patient outcomes (Atala & Kroth, 2020; Renee et al., 2020; Silvera, 2017). Teaching hospitals are mostly nonprofit and are significantly associated with better patient outcomes (Spaulding et al., 2018; Hamadi et al., 2019; Haley et al., 2017). This study explored the relationship between patient experience scores and CLABSI rates in nonprofit acute care hospitals in the United States. This study promotes positive social change through EBP that improves quality, patient safety, and clinical outcomes. Chapter 1 addresses the study's background, problem statement, purpose, research questions and hypotheses, theoretical framework, nature, definitions of terms,

assumptions, scope and delimitations, limitations, and significance, concluding with a summary.

### **Background**

CLABSIs are common HAIs associated with increased morbidity and mortality, prolonged hospital stays, and increased medical care costs for patients (CDC, 2016; Chovanec et al., 2021; McAlearney et al., 2015). The U.S. healthcare expenditure estimate in 2017 was \$3.5 trillion, representing 3.9% of the nation's gross domestic product (CMS, 2018a). The increasing cost of healthcare is a substantial issue for U.S. policymakers, patients, and families (Meluch & Oglesby, 2015). CLABSI prevention remains a national priority (CMS, 2018b). The transformation to patient-centered health care demands hospital leadership's understanding of quality performance and pathways to meet patients' needs efficiently and safely. The competitive healthcare environment requires hospital management teams to advance safety, quality, and the patient experience while achieving financial goals. Quality improvement primarily focuses on patient outcomes, safety, and experience.

The Patient Protection and Affordable Care Act (PPACA) of 2010, also known as the Affordable Care Act (ACA), implemented HVBP to promote quality care and efficiency (Izon & Pardini, 2018). HVBP is designed to levy financial penalties on hospitals based on quality metrics, including CLABSI prevalence and patient experience (Meddings & McMahon, 2017). The HVBP domains have clinical outcomes, safety, patient experience, efficiency, and cost reduction (Collins, 2018). Previous studies have expounded on the impact of HVBP on hospital quality indicators and the competitive

advantage of the reward and penalty reimbursement program (Bastian et al., 2016; Caron, 2017; Eastman, 2018; Izon, 2018; McAlearney, 2015; Strickler et al., 2018).

Additionally, Abrahamson et al. (2016) and Elliot et al. (2016) explained the potential for HVBP to produce unintended consequences.

In collaboration with the CMS, the Agency for Healthcare Research and Quality (AHRQ) developed the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) as the first national, standardized, publicly reported survey of patients' perception of hospital care (CMS, 2019a). The HCAHPS was first included in the value-based incentive payments beginning with discharges in October 2012 (CMS, 2019a). CMS requires hospitals to administer the survey to a random sample of adults discharged from a wide selection of medical services (Quality Net, 2019). The HCAHPS top box score is the percentage of responses in the highest possible category for a question, section, or survey publicly reported on the CMS Hospital Compare website (Quality Net, 2019). The Hospital Compare data inform consumer decisions and help providers and payers monitor and improve the quality of care (Elliott, 2015; Mazurenko et al., 2017).

Patient experience scores assess safety culture, meet patients' needs, and prevent adverse events (Ryan, 2017; Rand et al., 2019). Previous studies have linked CLABSIs to deviations from established EBP (Morrison et al., 2017). Matlab et al. (2022) completed a cross-sectional correlational study to investigate predictors of knowledge and compliance of registered nurses to central venous catheters (CVCs) care bundle. The study showed



that nurses' knowledge about CLABSI prevention practices significantly correlates with their compliance with the CVCs maintenance care bundle (Matlab et al., 2022).

A systematic literature review to examine the relationship between hospital or system-wide interventions and HAIs highlighted structural and process approaches warranting additional research and policy exploration to address gaps in existing literature (Maurer et al., 2020). Future research to explore other hospital characteristics' impact on efficiency and outcome measures separate from size is recommended (Rosko et al., 2018; Silvers, 2017).

This study fills a literature gap in exploring the relationship between patient experience and CLABSI rates in nonprofit acute care hospitals in the United States. Additionally, clinicians must understand quality care, outcome measures, and financial implications (Brooks, 2017; Mukumbang & Adejumo, 2014). Implementation of EBP, innovation in clinical practice, and stakeholder involvement improve patient outcomes (Chovanec et al., 2021).

### **Problem Statement**

The research problem was the need for more information about the relationship between patient experience of care measured through the HCAHPS survey and patient outcome measured through CLABSI rates in nonprofit acute care hospitals in the United States. Nonprofit ownership described the largest group of hospitals in the United States and included teaching and nonteaching status. CLABSIs remained the most common HAIs associated with hospital care direct and indirect costs (CDC, 2019a). Each CLABSI was estimated to cost \$25,000 to \$32,000 due to prolonged hospital stay, increased health

costs, and mortality (Herring, 2017; Strickler et al., 2018). Nearly 70% of CLABSIs are preventable through infection prevention and control (IPC) and EBP, including proper hand hygiene (Jones et al., 2015). Mandated public reporting of quality measures and HVBP financial impact created new incentives for hospital quality improvement.

Hospital characteristics such as ownership, teaching status, size, and location have been associated with quality performance; little has been known about the extent of hospital structure's influence on patient experience and other quality measures (Drews et al., 2017; Liao et al., 2020). Previous CLABSI studies focused primarily on the intensive care setting. Further research was recommended to explore the association between patient experience of care and CLABSI incidences in acute care hospitals (Woodward & Umberger, 2016). Effective communication and interpersonal skills were found inherent to interactions among healthcare teams, clinicians, patients, and families. Providers use empirical data on the relationship between process and quality outcome measures to develop strategies to prevent CLABSIs, improve patient experience, and inform public health policy.

### **Purpose of the Study**

This correlational study examined the relationship between CLABSI rates and HCAHPS scores in hospital room cleanliness, communication with nurses, and staff responsiveness. The applicable population for this study was nonprofit acute care hospitals in the United States. The independent variables (IVs) were HCAHPS scores for hospital room cleanliness, communication with nurses, and hospital staff responsiveness. The dependent variable (DV) was CLABSI SIR rates. Morrison et al. (2017) discussed

the leading cause of CLABSI as deviations from established guidelines for central line management. Though CLABSIs can be prevented, they remain a prevalent public health problem in acute care hospitals. Through this study, I aimed to fill a gap in the literature regarding the relationship between patient experience of care and outcome measures. Finally, this research promotes social change through empirical data that healthcare professionals can use to understand the care they provide, promote EBP, and improve patient experience and outcome measures.

### **Research Question and Hypotheses**

To examine whether a relationship existed between selected patient experience HCAHPS scores and CLABSI rates in nonprofit acute care hospitals in the United States, the following research question and hypotheses guided the study:

Research question: Is there a relationship between patient experience measured through HCAHPS scores of room cleanliness, communication with nurses, responsiveness of hospital staff, and standardized infection ratios for central-line-associated bloodstream infections in nonprofit acute care hospitals in the United States?

H<sub>0</sub>: There is no relationship between patient experience measured through HCAHPS scores of room cleanliness, communication with nurses, responsiveness of hospital staff, and standardized infection ratios for central-line-associated bloodstream infections in nonprofit acute care hospitals in the United States.

H<sub>a</sub>: There is a significant relationship between patient experience measured through HCAHPS scores of room cleanliness, communication with nurses, responsiveness of hospital staff, and standardized infection ratios for central line-associated bloodstream infections in nonprofit acute care hospitals in the United States.

### **Theoretical Foundation**

Avedis Donabedian's (1997) theory of the relationship between structure, process, and outcome (SPO) was the theoretical framework chosen for this study. Donabedian was a physician and health services researcher who developed the original SPO model in 1966 to guide the theory and practice of quality assurance and health services research (Ayanian & Markel, 2016). Donabedian's SPO model offers a contextual framework to derive expectations about the relationship between hospital structures, the process of care delivery, and quality outcome measures (Yankovsky et al., 2016). Singh and Boyle (2020) explained how the Donabedian SPO model facilitates multifaceted continuous quality assessment and improvement. The structure includes organizational structure, clinical services, and physical environment. Process measures are quality indicators from a specific process influencing patient outcomes (Singh & Boyle, 2020). Kobayashi et al. (2011) applied Donabedian's SPO approach to explore patients' experiences and perceptions of the quality of nursing service. Donabedian's model provides providers and policymakers with a strategic approach to quality improvement.

The hospital structure denotes ownership and teaching status associated with financial, medical management, and human resources acquisition. Moreover, teaching hospitals provide medical education, residency training, research, specialized services, and modern technology to treat complex diseases. Adherence to appropriate CLABSI preventive measures and clinical practice guidelines engenders an organizational culture that promotes innovation, continuous education, and practice standardization. Adequate staffing, EBP, and a multidisciplinary team approach are pertinent to improve total performance scores (TPS) that are used for HVBP.

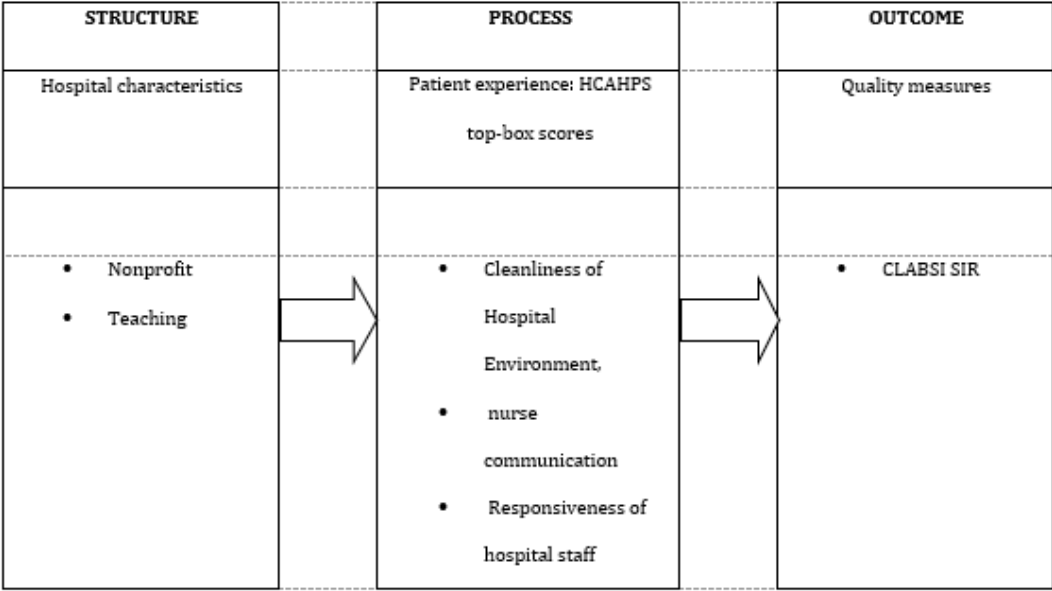
In this theoretical framework, the process domain is composed of actions, care provision, and patient and provider interactions. The care delivery process encompasses the activities or decisions that drive or reduce care provision (Donabedian, 1982; Williams & Wan, 2016). The process domain focuses on how healthcare systems, patients, and providers interact to integrate service delivery, diagnostics, and treatments to meet the desired outcomes. The process measures involve activities completed, or decisions made in care delivery practices often mandated by legislative, regulatory, and professional entities (Ayanian & Markel, 2016). In this study, three areas of patient experience were selected as process measures that predict the outcome.

The outcome domain validates quality and refers to the effects of healthcare interventions on patients or populations (Ameh et al., 2017). Hospital CLABSI rates were the outcome measures. Human factors, safety culture, EBP, care coordination, and integration processes in the clinical environment impact outcome measures. Donabedian's SPO model was appropriate for this study as it supported the concept of

evaluating the hospital structure, the process of care coordination, integration, and quality outcome measures. Chapter 2 includes a detailed explanation of Donabedian’s primary theoretical propositions and hypotheses.

**Figure 1**

*Conceptualization of the Donabedian Theoretical Framework*



**Nature of the Study**

A quantitative correlational research design was selected for this study. The research design allowed correlation analysis between the IVs of cleanliness of the hospital room, nurse communication, and hospital staff responsiveness with the DV of hospital CLABSI SIR rates in nonprofit hospitals in the United States. I accessed and utilized secondary data from two nationwide databases. Hospital characteristics data were accessed from the American Hospital Directory (AHD). Nonprofit ownership defines the

largest group of hospitals in the United States and encompasses teaching and nonteaching status. The 2019 HCAHPS and CLABSI SIR hospital-level data were accessed from the CMS-sponsored Hospital Compare website. Statistical Package for Social Sciences (SPSS) version 28 was utilized to complete multiple linear regression analysis. The relationship between each IV and the DV was examined separately. The correlation study does not show causation. Comparisons across categories provided accurate results and established the study's rigor (Creswell, 2014).

### **Definitions**

*Acute care hospitals:* These are healthcare facilities that deliver time-sensitive care to an individual or population for an acute episode of illness, conditions resulting from disease or trauma, or during recovery from surgery (AHD, 2018).

*Teaching hospitals:* Hospitals that provide clinical education and training to current and future physicians and health professionals and engage in research and innovation (AHD, 2018).

*Nonteaching hospitals:* Include community hospitals whose main mission is to meet their community's primary health and medical needs (AHD, 2018).

*For-profit hospitals:* Also known as *proprietary hospitals*; are owned, managed, and funded either by investors or the shareholders of a publicly traded company (AHD, 2018).

*Nonprofit hospitals:* These are public charitable hospitals, have a community focus, and are exempt from federal income tax and state and local property taxes (AHD, 2018).

*The Hospital Consumer Assessment of Healthcare Providers and Systems*

*(HCAHPS)*: This is the first national, standardized, publicly reported survey of patients' hospital care perspectives. The HCAHPS survey captures the patient's communication experience with nurses and doctors, hospital staff responsiveness, communication about medicines, cleanliness and quietness of the hospital, discharge information, overall hospital rating, and likelihood to recommend (CMS, 2019b). In this study, the hospital environment's cleanliness, communication with nurses, and responsiveness of hospital staff scores were IVs.

*Central-line-associated bloodstream infection (CLABSI)*: This is a laboratory-confirmed bloodstream infection (LCBI) where an eligible bloodstream organism is identified, and an eligible central line is present on the LCBI date of the event (DOE) or the day before (CDC, 2019b). In this study, CLABSI is a DV.

*Healthcare-associated infections (HAIs)*: These infections develop in hospitalized patients after 48 hours or within 30 days of discharge (CDC, 2019c).

### **Assumptions**

This study's central assumption was that the data published on the CMS-sponsored Hospital Compare website accurately represented hospital-level CLABSI rates and patient experience. Additionally, I presumed that the HCAHPS survey responses represented each patient's view of the hospital care for the secondary data's credibility. To be precise, I assumed that the data publicly reported on the CMS Hospital Compare website and hospital data reported on the AHD website were accurate and without errors. These assumptions were necessary because the CMS Hospital Compare website and



AHD were the primary sources of information, and there were no other locations to retrieve the data.

### **Scope and Delimitations**

This study explored the relationship between patient experience measured through HCAHPS domains of cleanliness of hospital room, nurse communication, and staff responsiveness (IVs) and CLABSI rates (DV) in nonprofit acute care hospitals in the United States. CLABSIs are common HAIs that contribute to an extended hospital stay, high mortality, and increased healthcare costs (Herring, 2017; Strickler et al., 2018). This study did not include other HAIs such as catheter-associated urinary tract infections (CAUTI), surgical site infections (SSI), and ventilator-associated pneumonia (VAP). Only three domains of HCAHPS scores were selected as a proxy for patient safety. Provider characteristics that influence infection prevention and control (IPC) practices and patient experience of care include staff behavior, ineffective communication, and knowledge deficit (Harris et al., 2017).

The population included in this study was nonprofit acute care hospitals with complete CLABSI and HCAHPS datasets published on the Hospital Compare website. Likewise, hospitals that lacked exclusive data or did not report HCAHPS survey results were eliminated from the study. Nonprofit ownership defines the largest group of hospitals in the United States and encompasses teaching and nonteaching status. Additionally, Veterans Health Administration, psychiatric, rehabilitation, long-term care, children's, critical access (CAH), and Prospective Payment System (PPS)-exempt cancer hospitals that are exempted from value-based purchasing were excluded from this study

(CMS, 2019a). The CAH typically serves a particularly lower income population with a disproportionately high level of uncompensated care (Popescu et al., 2019).

Knowledge translation (KT) theory was considered for this study due to the capacity to integrate EBP into clinical practice and the leadership role in assimilating education, research, theory, and training to improve hospital quality performance (Kingsnorth et al., 2020). I did not select the KT theory for the study because many KT theories, models, and frameworks have limited evidence explaining their practical application (Esmail et al., 2020).

### **Limitations**

Several limitations are commonly associated with quantitative research.

*Generalizability:* The study findings cannot be generalized due to the specific sample that was studied. The publicly reported secondary data used in this study were also presumed to be accurate.

*External validity:* The study results are not applicable to other populations or settings due to the specific context in which the study was conducted.

*Lack of content:* The data collected for this quantitative study do not provide the full context or nuance of a particular phenomenon, as they were collected through structured methods that did not allow for open-ended responses.

*Dependence on self-report:* Patient experience measured through the HCAHPS survey was subject to biases such as social desirability bias or memory distortion for patients completing the survey. Notably, the CMS adjusts the HCAHPS scores for the effects of

patient mix and mode of survey administration before publishing the data on the Hospital Compare website (CMS, 2019a).

Additionally, quantitative studies often focus on measuring and describing relationships between variables rather than explaining why these relationships existed. The study was also limited in capturing change as it involved a short period (January 2019–December 2019), which may not have captured changes or trends over a more extended period.

*Ethical considerations:* Researchers must consider ethical issues such as informed consent and confidentiality when collecting data from human participants. This research used publicly reported secondary data that did not contravene ethical issues.

### **Significance**

This research fills the gap in understanding the relationship between hospital characteristics, CLABSI incidences, and patient experience by focusing on the quality of care as a precursor of patient experience in nonprofit acute care hospitals in the United States. The study is unique because it addressed under researched dimensions of quality care that impact clinical outcomes (Wilbers, 2018). The HCAHPS scores are associated with quality indicators, clinical outcomes, and financial reimbursement (Caron, 2017; Lianping et al., 2018).

### **Conceptual Framework Used in Conducting the Study**

Donabedian SPO's theoretical framework provides domains to investigate the relationship between hospital structure where care is provided, care delivery processes, and quality outcome measures. Implementation of HVBP increases HAI surveillance in

acute care hospitals in the United States. The CDC offers EBP guidelines to prevent HAIs, but there is still variance in hospital quality performance associated with hospital characteristics, resources, and organizational culture of patient safety (Saint, 2019). Regulatory and accreditation agencies seek to address gaps in clinical practice and improve patient experience and clinical outcomes while reducing healthcare costs.

HAI prevention has become a top priority, as many infections are preventable through a patient safety culture that enhances clinical processes and leverages quality improvement (Meddings et al., 2017). Nearly 70% of CLABSIs are preventable (Jones et al., 2015). Central line bundle care, handwashing, full barrier precautions, chlorhexidine for skin antisepsis, and avoiding femoral and unnecessary catheters are EBPs designed to prevent CLABSI (Jones et al., 2015). Literature reviews illustrate a heightened awareness of the need to decrease HAIs associated with medical procedures, antibiotic use, organizational factors, patient characteristics, healthcare providers' behaviors, and interactions with the healthcare system (Healthy People 2020, 2019). Understanding the relationship between hospital ownership characteristics, CLABSI rates, and patient experience may enhance IPC policies, procedures, guidelines, and regulations governing care delivery and staff behavior. Interdisciplinary communication and collaborative decision-making facilitate safe care.

The HVBP Program adjusts Medicare hospital payment from volume- to value-based through clinical care, safety, person and community engagement, and efficiency. Each domain is weighted at 25% of the total performance score (CMS, 2019a). HVBP rewards healthcare providers with incentive payments for the quality of care they

provide. Quality improvement through EBP promotes patient experience, clinical outcomes, and positive social change.

### **Summary**

CLABSIs are common HAIs that contribute to extended hospital stays, high mortality, and increased healthcare costs. Teaching hospitals are renowned as centers for innovation, research, and medical training for physicians (AHD, 2018). The HCAHPS survey provides a nationally standardized method of evaluating the patient's experience of care. This quantitative study examined the relationship between patient experience scores as predictors of CLABSI rates in nonprofit acute care hospitals in the United States.

The alignment of organizational structures, resources, employees, and patients' engagement improves quality performance (Kingsnorth et al., 2020; Simonetti et al., 2019). Quality improvement strategies to reduce CLABSI rates focus on central line bundle care and proper hand hygiene (Drews et al., 2017). This study examined the correlation between three IVs and an outcome measure as a DV. This study promotes positive social change by creating new information that furthers EBP, quality improvement, and public health policy.

Chapter 2 focuses on the literature review that provides information about HVBP, hospital characteristics, patient experience of care, HAIs, CLABSIs, IPC, and healthcare quality improvement. Additionally, Chapter 2 includes a reference list of relevant peer-reviewed studies and healthcare websites.

## Chapter 2: Literature Review

### Introduction

CLABSIs are common HAIs that contribute to the rising cost of healthcare in the United States. Previous studies show that CLABSIs' high cost in terms of hospital care is associated with an extended hospital stay, increased health costs, and mortality (Herring, 2017; Strickler et al., 2018). Approximately 250,000 CLABSIs are reported annually in U.S. hospitals and contribute to an estimated 60,000 patient deaths and an additional \$45,685-per-patient healthcare cost (Anuskiewicz et al., 2018; Drews et al., 2017). CLABSIs are associated with nearly 7 days of prolonged hospital stay and a mortality rate ranging from 4%–20% (Drews et al., 2017). The Institute of Medicine (IOM) landmark reports *To Err is Human* (1999) and *Crossing the Quality Chasm* (2001) advanced awareness of healthcare quality deficits and the need to have interprofessional and coordinated hospital care for patient safety (Liang et al., 2019; Van & Shah, 2020).

The implementation of HVBP under the 2010 ACA changed the healthcare landscape in the United States through a heightened focus on hospital quality, efficiency, and accountability (Izon & Pardini, 2018). Maddox et al. (2017) discussed the impact of public reporting of hospital quality of care, regulatory compliance, and HVBP on clinical process improvement. Nonetheless, Abrahamson et al. (2016) and Elliot et al. (2016) expounded on the potential for HVBP to produce unintended consequences. The HVBP domains include clinical outcomes, person, and community engagement, also referred to as patient experience, safety, efficiency, and cost reduction (Collins, 2018). The hospital environment and staffing matrix may impede nurse communication, an essential

component of care processes (Akinleye et al., 2019). Eastman (2018) and Woodward (2018) discussed precedents of care delivery, patient experience, and CLABSI rates as included in the HVBP program.

The research problem addressed in this study was the need for more literature that examines the relationship between patient experience of care measured by HCAHPS survey results and the quality outcome measure of CLABSI rates in nonprofit acute care hospitals in the United States. Nearly 70% of CLABSIs are preventable through IPC EBP (Jones et al., 2015). Morrison et al. (2017) discussed the leading cause of CLABSI as deviations from established guidelines for managing central lines. A patient-centered care model and healthcare information technology (HIT) have improved quality and patient safety (Liang et al., 2019; Van & Shah, 2020). Electronic medical records (EMRs) facilitate accurate documentation and chart review for compliance with processes and outcome measures. Concerns over clinical outcomes and economic burden drive a multifaceted approach to CLABSI prevention, including EBP, protocols, regulation, and mandated reporting (Currie, 2018; Whittington et al., 2017; Woodward & Umberger, 2016).

CMS implemented HCAHPS in 2006 as a national, standardized survey of hospital patients' experiences during their recent inpatient hospital stay (CMS, 2018a). For patient safety, healthcare providers are required to respond to individual patient needs in a timely fashion. The staffing pattern in U.S. acute care hospitals varies depending on hospital size, location, teaching status, and resources (Silver, 2017). Hospital structure impacts clinical processes and outcome measures, and future research has been

recommended to investigate the influence of diverse hospital characteristics on quality metrics (Rosko et al., 2018; Silvers, 2017).

Additionally, Woodward and Umberger (2016) recommended further research to explore the relationship between patient experience and CLABSI incidences in acute care hospitals. Wilbers (2018) proposed additional research to explore dimensions of care that are antecedents to patient experience. A gap in the literature existed concerning the relationship between efficiency, quality, and patient outcome measures. Patient safety remains a priority in health care delivery. Moreover, the high cost of healthcare in the United States and the opportunity for quality improvement in acute care hospitals inspired further research to unearth associated factors.

In this quantitative study, I aimed to explore the relationship between HCAHPS top-box scores of cleanliness of hospital environment, nurse communication, staff responsiveness, and CLABSI rates in nonprofit acute care hospitals in the United States. Archived publicly reported Hospital Compare data for January 1, 2019, to December 31, 2019, and AHD data were accessed from the websites. Multiple linear regression was used for data analysis. The results from this study provide information for healthcare professionals to understand the care they provide, change their behaviors, and advance health outcomes.

The information on hospital characteristics and quality outcomes provides information to develop strategies to reduce or eradicate CLABSI incidences, promote patient safety, and guide clinicians' behavior to improve the patient experience. Donabedian's SPO theoretical foundation was used to assess the quality of healthcare



(Donabedian, 1982; Haley et al., 2017). The HCAHPS scores of cleanliness of the hospital environment, communication with nurses, and responsiveness of hospital staff denoted care delivery processes that influence the outcome measure of CLABSI rates. The study results may inform public health policy, allocation of hospital resources, and quality improvement. Chapter 2 includes the literature search strategy and the theoretical framework for the study. In addition, a literature review related to the key variables and concepts of the study, such as quantitative research, hospital characteristics, HVBP, quality and patient safety, HCAHPS, HAIs, CLABSIs, hand hygiene, and HCAHPS, is included in this chapter.

### **Literature Search Strategy**

I identified 1,004 literature review articles by searching Walden Library databases using keywords, phrases, and search strategies to obtain the most recent and relevant literature. Twenty-eight duplicate articles were removed, and another 741 articles were found irrelevant based on research settings and types of publication. A total of 235 articles were assessed for eligibility, of which 82 full-text articles met the inclusion criteria, as illustrated in Figure 2. The databases mainly covered human services, health services, nursing, and public health policy subjects. The search included electronic databases such as Academic Search Complete, Business Source Complete, ProQuest, MEDLINE, OVID, PubMed Central, and Cumulative Index of Nursing and Allied Health Literature (CINAHL), as well as the Google Scholar search engine. Keywords or index terms were applied in different combinations to find relevant articles using Boolean operators. Search limiters included peer-reviewed articles published

between the years 2015 and 2021. Most articles were retrieved from CINAHL and MEDLINE.

Search words included *hospital characteristics, hospital ownership, hospital teaching status, patient experience, patient perception, Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), Patient Protection and Affordable Care Act, Hospital Value-Based Purchasing (HVBP), quality health care, healthcare-associated infections (HAIs), central-line-associated blood infection (CLABSI), cleanliness of hospital environment, nurse communication, patient safety, and Donabedian theoretical framework*. A comprehensive list of the terms and phrases was incorporated in an appendix found in the dissertation checklist. Citation chaining was used to identify older articles that influenced newer research and accounted for Donabedian's theoretical framework and the Patient Protection and Affordable Care Act of 2010 (ACA or “Obamacare”). Several national healthcare websites, databases, and coalitions such as CMS, CDC, Hospital Compare, Quality Net, and AHRQ, among others, were searched for relevant information. Walden's dissertations in health services were also searched to provide congruent information and historical perspective for the study. Understanding the relationship between hospital ownership characteristics, CLABSI rates, and patient experience may enhance IPC policies, procedures, guidelines, and regulations governing care delivery and staff behavior. The literature review provided empirical evidence on constructs and broad concepts that underpinned this study.

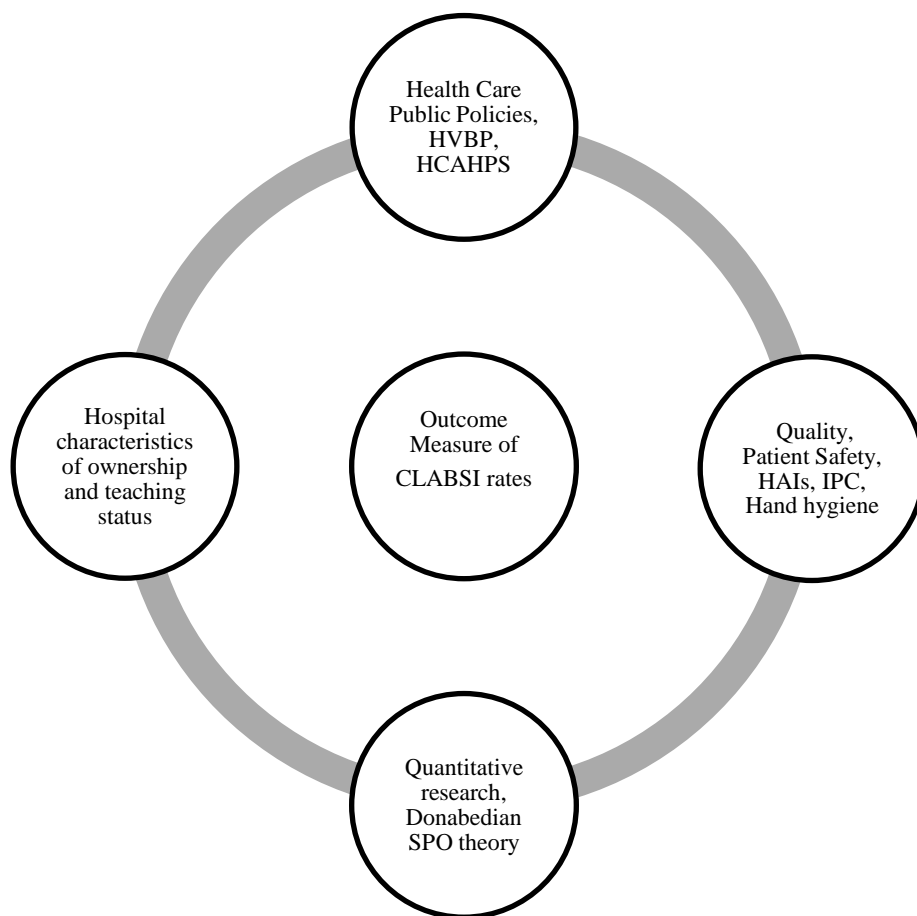
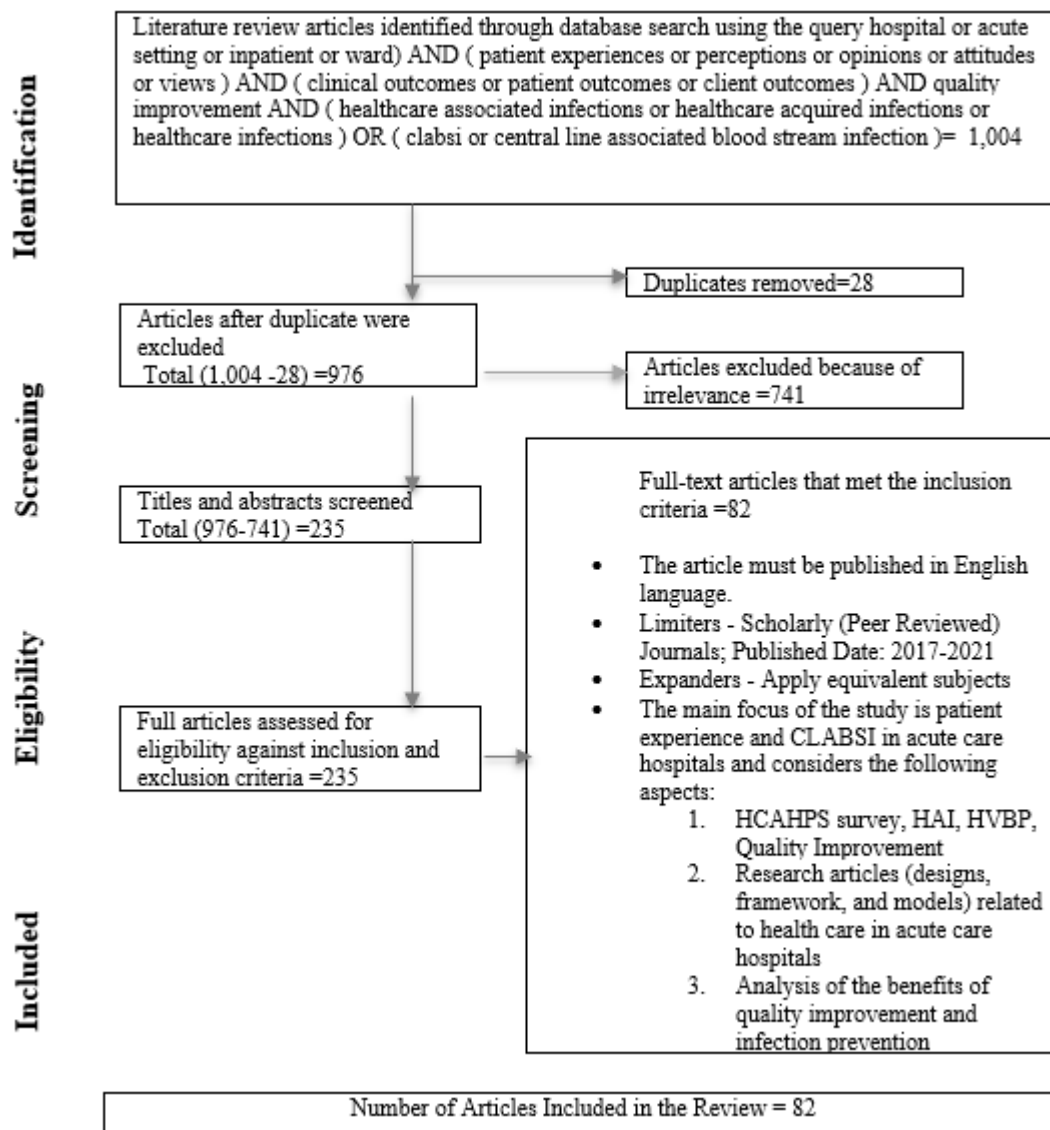
**Figure 2***Literature Search Broad Concepts*

Figure 3

## Flow Diagram of Search Literature Query and Inclusion Criteria



## Theoretical Foundation

The theoretical foundation found appropriate for this study was the Donabedian theory of the relationship between structure, process, and outcome (SPO). Donabedian, a physician and health services researcher, developed the original SPO model in 1966 to guide the theory and practice of quality assurance and health services research (Ayanian & Markel, 2016). The Donabedian model of quality of care was used as the framework to provide objective criteria for evaluating patient care. Components of healthcare delivery are categorized into structure, process, and outcome indicators to provide an organized approach to quality improvement. Maurer et al. (2020) used Donabedian's SPO model to examine the relationship between hospital interventions and HAIs. The study reviewed structural and process approaches that warrant additional research and policy exploration to address gaps in existing literature (Maurer et al., 2020).

Donabedian's perspective on the quality of care is used to specify domains of hospital quality indicators. Tossaint-Schoenmakers et al. (2021) used the Donabedian SPO framework to conduct a systematic literature review to investigate structure and process indicators related to outcome measures. Additionally, Haley et al. (2017) used Donabedian's SPO model to conduct quantitative research that examined the association between patient experience of care and outcome measures. The study showed that patient experience was significantly associated with patient outcomes (Haley et al., 2017). The Donabedian model has been previously used to explore the relationship between patient experience and clinical outcomes. Adaptation of the Donabedian model breaks down the measurement of healthcare quality into three broad categories that can be applied to

practice. Assessing the setting and processes in which health care is delivered provides a holistic approach to quality valuation. The process and structure of care data are valuable metrics used to identify quality problems before they become evident as unacceptable outcomes.

The SPO model is cited as a lasting theoretical framework for healthcare quality, although it does not expound on patient factors that affect outcomes (Yankovsky et al., 2016). Breyer et al. (2019) epitomized Donabedian's SPO model to describe quality, safety, infection, and mortality domains of hospital quality measures. In their study, they expounded on how different government and private agencies use quality indicators in research, clinical practice, and hospital benchmarking (Breyer et al., 2019). Additionally, hospital ownership structure, teaching status, and size influence communication, provider behavior, processes of care, and outcomes. Donabedian (1982) illustrates causal linkages between healthcare structural attributes, care processes, and outcomes. In this study, the Donabedian SPO model was conceptualized as follows:

### **Structure**

The structure domain reflects the hospital's characteristics of ownership and teaching status. Nonprofit hospital structures may primarily be classified as teaching and nonteaching. Hospital proprietors and academe may influence human resources, material management, staff education, and technology infrastructure (Berwick & Fox, 2016; Donabedian, 1997). Additionally, previous studies have shown that hospitals in a healthcare system are more likely to score higher on HVBP incentive domains than independent hospitals (Ramirez et al., 2016; Spaulding et al., 2018). Hospitals that are

integrated into healthcare systems have adequate registered-nurse and hospitalist staffing levels and are observed to score high on HCAHPS survey (Lasater et al., 2019).

Spaulding et al. (2018) described how hospital characteristics, resources, organizational culture, and staff behavior impact healthcare delivery processes and patient outcomes. In this study, nonprofit teaching and nonteaching hospitals were included.

### **Process**

The process component focuses on patient – provider interactions within the healthcare system. The process measure is conceptualized as healthcare delivery practices often mandated by legislative, regulatory, and professional agencies (Ayanian & Markel, 2016). Technical and interpersonal skills enhance the patient’s experience through effective communication, empathy, and personalized care. The nurse's role includes clinical leadership, EBP, management of the hospital environment, quality, and patient safety (Oldland et al., 2020). Healthcare providers must be responsive to patient needs and preferences. Rincon et al. (2020) found that providers use healthcare technology to expand clinical services and facilitate patient education and care management (Rincon et al., 2020). Additionally, Rincon et al. (2020) observed the use of telehealth with no variance in doctor communication ratings on HCAHPS surveys. In this study, the HCAHPS domains of cleanliness of the hospital environment, nurse communication, and staff responsiveness were included as the process of care measures. Patient experience scores may relate to incidences of adverse events in the acute care setting.

## **Outcome**

The outcome measure represents the impact of medical care on patients' and populations' health status in terms of recovery, restoration of function, and survival (Donabedian, 1997; Williams & Wan, 2016). Quality measures include HAI rates, patient experience of care, readmissions rates, length of hospital stay, morbidity and mortality, safety, efficiency, and cost reduction (CMS, 2018a). Organizational culture, leadership, and clinical practices impact process and outcome measures. Hospitals' leadership makes decisions on procurement, distributes resources, and guides clinical and non-clinical teams to achieve organizational goals. Similarly, quality improvement is achieved through a culture of safety, resources, and staff education. The previous study shows an association between hospital ownership and outcome measures (Bjorvatn, 2018). Hospital CLABSI rates are the outcome measure included in this study. The preamble of the Donabedian SPO theoretical framework is anchored in organizational science, which denotes that a good structure improves the process, and a good process increases the probability of good outcomes (Donabedian, 1997).

Quality outcome indicators include (CLABSI rates); process measures (HCAHPS top-box scores of communications with nurses, the responsiveness of hospital staff, and cleanliness of the hospital environment). The structured domain is illustrated by nonprofit teaching and nonteaching hospital characteristic. Variations in the structure, systems, and care processes contribute to differences in the quality of care. Marcin et al. (2020) performed a quantitative study using a linear regression model to examine the associations between process measures of quality and physician and hospital-level



factors. Quality process measures were positively associated with care delivery at freestanding children's hospitals (Marcin et al. (2020).

Additionally, Liu et al. (2018) conducted a cross-sectional study in 23 hospitals to explore the impact of nursing work environment, workload, nursing care left undone, and nurse burnout on patient outcomes. The study showed that work environment and workload, directly and indirectly, affect outcomes through nursing care left undone and nurse burn (Liu et al., 2018). Patient education empowers healthcare consumers to advocate for optimal care of their central lines (Suttle et al., 2019).

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

This quantitative correlational research study aimed to examine the relationship between patient experience and clinical outcomes. The literature review was based on the support and gaps related to constructs of interest and chosen methodology consistent with the scope of this study. The literature review identified the quality of care and patient experience as multidimensional constructs. Hospital structure and the care environment may drive patient outcomes. This section was divided into eight parts: Quantitative research, hospital characteristics, HVBP, quality, patient safety, HVBP, HAIs, CLABSI, hand hygiene, and HCAHPS. Each part provided information on how researchers analyzed an identified problem in healthcare.

Researchers have identified the health and financial burden associated with CLABSI prevalence in acute care hospitals (Aniskiewicz et al., 2018; Drews et al., 2017; Saint, 2019). The main objective of the literature review was to determine whether hospital ownership and teaching status are related to care delivery processes and clinical

outcomes. No correlational research study explored the relationship between patient experience measured through HCAHPS domains of cleanliness of hospital environment, nurse communication, staff responsiveness as independent (IVs), and CLABSI rates as a dependent (DV) in nonprofit acute care hospitals in the United States. Nonprofit ownership status defines the most extensive teaching and nonteaching hospitals in the United States. This study was essential to fill a gap in the literature that needed to be included.

### **Quantitative Research**

Quantitative research tests a hypothesis by analyzing distinct variables and using statistics to show how they relate to the hypotheses (Creswell, 2014). Additionally, quantitative research typically uses a large sample size and promotes confident prediction and generalizability from the study sample to the larger population. The quantitative correlational study may include surveys, observations, and secondary data to perform statistical analysis that examine the relationship between variables and make predictions (Creswell, 2014). Noaman et al. (2017) explain how technology is used in data mining to predict CLABSIs and analyze large datasets to discover new opportunities to improve quality and patient safety in acute care hospitals.

Secondary data was used in this quantitative correlational research to examine the relationship between patient experience of care measured through HCAHPS and CLABSI rates in nonprofit hospitals in the United States. Health care's structure, process, and outcome domains are relevant to research, clinical practice, regulation, accreditation, public reporting, and surveillance (Adirim et al., 2017). Quantitative correlational

research methodology was chosen to objectively make unbiased predictions of the relationship between the identified independent and DVs.

### **Hospital Characteristics**

Atala and Kroth (2020) expound on the three significant categories of hospital ownership in the United States for-profit, nonprofit, and government-owned hospitals. Empirical evidence shows that healthcare outcomes vary based on patient demographic, resources, payer, trauma center level, hospital teaching status, and medical practitioners' class distribution (Saint et al., 2019). Previous research demonstrated a relationship between hospital resources and clinical outcomes (Rincon et al., 2020). Gabriel et al. (2018) conducted a research survey to investigate the relationship between hospital ownership type and population health initiatives. The study results showed that nonprofit hospitals appear most likely to be involved in population health improvement activities (Gabriel, 2018). Hospital ownership and teaching status are significantly associated with quality outcome measures (Daras et al., 2018; Haley et al., 2017).

### **Nonprofit Hospitals**

The fundamental difference between for-profit and nonprofit hospitals is the financial structure and tax code (Atala & Kroth, 2020). Nonprofit hospitals are exempted from paying federal, state, income, property, and sales taxes in exchange for providing charity care and other community services (Atala & Kroth, 2020). Additionally, nonprofit hospitals create partnerships with various organizations, public health departments, and state and federal agencies to improve population health (Park et al., 2020). Briasoulis et al. (2019) explain how community benefit from hospitals and health system activities

outweigh the value of the federal tax exemption. The American Hospital Directory (AHD) categorizes hospitals based on ownership and control, geographical location, and teaching status. Nonprofit hospitals include teaching and nonteaching medical facilities that describes the largest group of hospitals in the United States. The focus on teaching and nonteaching hospital characteristics is based on previous studies that show how resources vary based on the teaching status. Hospital ownership influences decision-making, accountability, and social functions (Haley et al., 2017).

### **Nonteaching Hospitals**

Nonteaching hospitals are primarily independent community hospitals. Patients in rural hospitals have less complicated medical conditions and lower acuity levels (Lee et al., 2015). Studies show a correlation between HAI and patient acuity, and CLABSI incidences are expected to be lower in rural hospitals (Lee et al., 2015). Nevertheless, nonteaching hospitals experience financial burdens due to limited resources that may contribute to poor patient outcomes (Akinleye, McNutt, Lazariu, & McLaughlin, 2019). Organizational culture, leadership support, and quality management require proactive interventions and resource utilization, irrespective of the hospital's teaching status.

### **Teaching Hospitals**

Teaching hospitals, also called academic medical centers, mainly belong to a healthcare system and are more likely to score high on the HVBP than independent hospitals (Spaulding et al., 2018). Teaching hospitals are hubs for new technology, resource utilization, and a diversified workforce that improve quality and patient outcomes (Silber et al., 2020). Sabesan et al. (2020) found that mortality, length of stay,

and healthcare cost were higher in teaching than nonteaching hospitals when controlling for case mix and patient acuity. Hospital teaching status, number of hospital beds, affiliation with a medical school, presence of hospitalists, and infection control and prevention program characteristics are associated with HAIs prevalence (Sabesan et al., 2020). Teaching hospitals are generally large, with more licensed beds than nonteaching community hospitals. Silvers (2017) explain how patient experience and patient safety are diminished as hospital size increases in bed occupancy. An adequate staffing matrix and medical supplies are essential for quality care (Karapanou et al., 2019). Emerging concepts to transform quality and patient safety in health care include high-reliability organizations, benchmarking, the culture of safety, effective leadership, and systems thinking (Breyer et al., 2019). Further research on the relationship between hospital characteristics, patient safety, and adverse effects is beneficial.

In this study, teaching and nonteaching hospital structures are included. Hospital resources, organizational culture, and staff behavior impact healthcare delivery processes and patient outcomes (Spaulding et al., 2018). Teaching hospitals are more likely to score high on Hospital Value-Based Purchasing (HVBP) than nonteaching hospitals due to improved patient outcomes.

### **Hospital Value-Based Purchasing**

In 2011, the Center for Medicare and Medicaid Services (CMS) implemented the HVBP initiative that links acute care hospitals' payments to their performance on clinical processes and outcome quality measures (Ashkar, 2015; Medicare Learning Network, 2017). The HVBP program was established under section 1886(o) of the Social Security,

impacting payment for inpatient healthcare in more than 3,000 hospitals across the (CMS, 2015). The CMS reports over 100 measures describing hospital quality domains (Adirim et al., 2017). Process and outcome measures are included in the HVBP.

This section discusses theoretical and empirical literature related to hospital value-based purchasing (HVBP). Hospital quality metrics encompass processes of care, patient experience, outcomes, and efficiency domains (Adirim et al., 2017; Hamadi et al., 2019). For the fiscal year 2019, the quality domains included clinical outcomes 25%, Person and Community Engagement 25%, Safety 25%, and Efficiency and Cost Reduction 25% (CMS, 2018b). Spaulding et al., (2018) found that hospitals belonging to a healthcare system are more likely to score high on HVBP. Silver (2017) also found that higher patient experience scores correspond to reduced incidence of adverse events. The effects of HVBP on clinical outcomes are debated widely. Haley (2017); Ramirez et al. (2016) associate HVBP with improved clinical outcomes. On the contrary, Figueroa (2016) discusses how pay-for-performance programs are largely ineffective in improving quality care.

## **Quality and Patient Safety**

### **Quality**

The Institute of Medicine (IOM) defines quality care as safe, effective, patient-centered, timely, efficient, and equitable (AHRQ, 2020). Patient-centered care is defined as care that is respectful of and responsive to individual patient preferences, needs, and values (AHRQ, 2020). The vast majority of quality measures address effectiveness and safety. In this study, the cleanliness of the hospital environment, nurse communication,

and responsiveness of the hospital staff are chosen as IVs on the premise of patient-centered care. Effective communication and timeliness enhance care coordination. Patients need the opportunity to ask questions and get involved in decision-making. Additionally, the cleanliness of the hospital environment is associated with infection prevention.

Doctors and nurses play vital roles in healthcare delivery. Notably, nurses' responsibilities in healthcare quality comprise management and clinical leadership (Oldland et al., 2020). Mutual respect is inherent to interactions between clinicians, patients, and their families. Henry et al. (2020) discuss the application of technical and interpersonal skills in patient care. Proactive interventions, knowledge, attitudes, and behavior are impacted by organizational culture (Martinez et al., 2015). A holistic approach to health care encompasses multidimensional interactions, interdependence, and knowledge exchange.

Notwithstanding, methods for assessing the quality of medical care include patient surveys are tools. A patient-centered approach is recommended to engage all stakeholders in care delivery. Additionally, patient-provider exchange creates knowledge and skills to improve processes and outcomes. Healthcare providers must consistently deliver quality care and be responsive to patient needs. Effective communication, respect, responsiveness of hospital staff, and the cleanliness of the hospital environment influence patients' perception of care delivery (Kumah, 2019).

## **Patient Safety**

Patient safety remains a priority in health care delivery and relates to actual or potential bodily harm (AHRQ, 2020). The staffing matrix impacts efficiency and effectiveness in care delivery. Silvera (2017) explains how the staffing pattern in the United States acute care hospitals varies depending on hospital size, location, teaching status, and resources. Additionally, effective communication links multiple aspects of patient care processes (Akinleye et al., 2019). Nurses and other multidisciplinary teams discuss opportunities and lessons learned in care delivery to promote a culture of safety, reduce medical errors, and improve quality.

Similarly, hospital leadership governs fiscal management to redesign operations and workflows for safe and quality care (Atala & Kroth, 2020). Innovative methods to improve care delivery include electronic medical records (EMR) that facilitate accurate documentation, adverse event review, clinical decision support, process, and outcomes evaluation (Liang et al., 2019; Van & Shah, 2020). Aloush and Alsaraireh (2018) found that organizational structure, nurse-patient ratio, and staff behavior impact patient experience and outcome measures.

The IOM landmark reports of *To Err is Human (1999)* and *Crossing the Quality Chasm (2001)* advanced awareness of healthcare quality deficits and the need to have interprofessional, coordinated hospital care for patient safety (Liang et al., 2019; Van & Shah, 2020). Effective communication is a significant factor in delivering safe and timely care that positively impacts patient experience and clinical outcomes. According to AHRQ (2020), the term timely refers to reducing waiting and harmful delays for both



those receiving and providing care. The CMS quality improvement strategy focuses on making health care safer by reducing harm, improving support for a safety culture, promoting effective communication, and making care affordable (CMS, 2015). Federal government agencies ensure patients receive high-quality and safe care through accreditation and regulatory aspects (CMS, 2018a).

### **Healthcare-Associated Infections**

Healthcare-associated infections (HAIs) are among the leading causes of morbidity and mortality in hospitalized patients; they affect more than 2 million patients annually; and result in an estimated 90,000 deaths per year in the United States (Drews et al., 2017). The CMS categorizes HAI as an adverse event. National Healthcare Surveillance Network (NHSN) coordinates HAI surveillance and infection prevention and control (IPC) data. Increased HAIs surveillance and reporting provide a roadmap to reduce and eliminate HAIs (Herring, 2017). The CDC provides EBP guidelines to prevent HAIs. According to Lee et al., 2015; Steves Lavalette, 2019 and Saint, 2019, some hospitals view IPC programs as costly and challenging to fund. Financial constraints impede resources for robust quality and process improvement.

### **Central-Line-Associated Bloodstream Infections**

Central line-associated bloodstream infections (CLABSIs) remain a common and costly patient safety threat in acute care hospitals in the United States (Saint, 2019). Yazan and Hariharan (2019) define CLABSI as a laboratory-confirmed bloodstream infection unrelated to any infection at another site; that develops within 48 hours of central line placement. Approximately 250,000 CLABSIs are reported annually and

contribute to an estimated 60,000 patient deaths and an additional healthcare cost of \$45685 in the United States (Aniskiewicz et al., 2018; Drews et al., 2017). Infections caused by antimicrobial-resistant organisms are difficult to treat and mostly require extended hospital stays (Currie, 2018). Nearly 70% of CLABSIs are preventable (Jones et al., 2015). Nationally, the CLABSI rates have decreased in recent years due to the implementation of central line care bundles. However, many hospitals continue to experience high prevalence, a premise that warrants further studies (Patel et al., 2019). A multifaceted approach, EBP, protocols, regulation, and mandated public reporting are associated with CLABSI prevention (Currie et al., 2018; Whittington et al., 2017; Woodward & Umberger, 2016).

Lee et al. (2015) conducted a quantitative study using logistic regression models to compare changes in CLABSI rates across different hospitals post the implementation of HVPB in the United States. The study results showed that HVPB financial penalties heighten HAI surveillance and emphasize CLABSI prevention (Lee et al., 2015). The Institute for health care improvement (IHI) recommends central line care bundles, hand washing, full barrier precautions, chlorhexidine for skin antisepsis, avoidance of femoral catheters, and removal of unnecessary catheters to prevent CLABSIs (Jones et al., 2015; Meddings et al., 2017; Saint et al., 2019). Care bundles are a set of EBPs that, when performed collectively and reliably, have been shown to improve patient outcomes (Prakash et al., 2017). Aloush and Alsaraireh (2018) conducted a descriptive cross-sectional observational study to assess nurses' compliance with central line maintenance guidelines. The results revealed that the nurse-patient ratio significantly predicts nurses'

compliance with CLABSI prevention guidelines. Karapanou et al. (2019) also conducted an observational study by completing 913 audits to monitor hospital compliance with central venous catheter insertion and management practices. The results showed improved conformity with practice guidelines with no decrease in CLABSI incidence. Increased central line bundle care compliance may significantly decrease CLABSI rates (Karapanou et al., 2019).

Educational activities are essential to mitigate knowledge deficits in clinical practice. Hospital IPC plan and risk assessment include policy and procedure, staff training, audits, feedback, and action plans (Mitchell et al., 2019). The relationship between hospital characteristics, patient safety, and adverse effects requires further investigation. Factors that impede CLABSI prevention include patient characteristics, antibiotic-resistant pathogens, and organizational structure (Hugill, 2017). Hospital leadership engages key stakeholders in quality improvement and IPC initiatives.

### **Hand Hygiene**

Hand hygiene (HH) is considered the most important and effective method for reducing cross-contamination to prevent HAIs (Hillier, 2020; Nguyen, 2020). The World Health Organization (WHO) describes the five moments of hand hygiene: Before patient contact, before aseptic task, after body fluid exposure risk, after patient contact, and after contact with the patient's surroundings (WHO, 2020). Proper HH guidelines include using an alcohol-based rub or handwashing with soap and water if hands are visibly dirty. Scientific evidence shows the hospital environment is a reservoir for many pathogens (Facciola et al., 2019). Contact with patients and their environment increases the risk of

contamination. Proper HH techniques are essential to prevent cross-contamination.

Hospital administrators increase HH compliance rates by facilitating the provision of essential supplies, staff education, and training (Huy, 2020; Miranda-Novales, 2020; Plaza, 2018). Direct HH observations are performed regularly to provide timely feedback and mitigate human and environmental factors (Merino-Plaza, 2018; Ojanperä, 2020; & Saint, 2019). Healthcare providers share responsibilities to improve patient experience and clinical outcomes (Haley et al., 2017).

### **Hospital Consumer Assessment of Healthcare Providers and Systems**

The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey was developed by the Agency for Healthcare Research and Quality (AHRQ) in collaboration with CMS to improve patient experience (CMS, 2018b). The CMS implemented HCAHPS in 2006 as a national, standardized survey of hospital patients' experiences during their recent inpatient hospital stay (CMS, 2018b). The HCAHPS survey comprises six composite measures, two individual items, and two global items (CMS, 2019b). The composite measures contribute to the statistical reliability of the survey (Health Services Advisory Group, 2019).

Hospitals participating in HVBP submit HCAHPS scores to CMS; The data is adjusted for the effects of patient-mix and mode of survey administration before being published on the Hospital Compare website as "top-box," "bottom-box," and "middle-box" scores (CMS,2018a). The "top box" is the most positive response to HCAHPS survey items (CMS, 2018a). The top-box response is "Always" for four HCAHPS composites: Communication with nurses, communication with doctors, the

responsiveness of hospital staff, and communication about medicines. The two individual domains are cleanliness of the hospital environment and quietness of the hospital environment, and the top box response is "Yes." For the discharge information composite, a 9 or 10 is considered high. For the overall hospital rating item, definitely "yes" for the recommended hospital item, and "strongly agree" for the care transition composite (CMS, 2018a).

The HCAHPS scores are publicly reported on the Hospital Compare website (CMS, 2018a). Healthcare providers and consumers access Hospital Compare data to benchmark quality performance. Publicly reported quality data to increase transparency and accountability in health care delivery.

Diwan et al. (2019) conducted a retrospective study to evaluate HCHPS survey responses in each domain. The study showed that hospital length of stay affects patient satisfaction and the. Likelihood to recommend the hospital to others (Diwan et al., 2019). A quantitative correlational study by Kumah (2019) demonstrates a significant relationship between patients' perceptions of nursing care, hospitals' culture, and overall experience. Silvera (2017) found that patient safety and satisfaction diminish with increased hospital bed occupancy.

The HVBP is occasionally perceived as a penalty system that offers no measurable benefits to patients (Butenko et al., 2017; Hsu et al., 2020; Pfeifer, 2019; Woodward & Umberger, 2018). Carter and Silverman (2016) conducted an in-depth literature review to explore patient surveys and satisfaction as a component of HVBP.

The study highlights the patient survey's inability to assess patients' perception of technical care domains (Carter & Silverman, 2016).

Listed in Table 1 are the HCAHPS survey topics and domains.

**Table 1**

*Hospital Consumer Assessment of Healthcare Providers and Systems Survey Topics and Domains*

HCAHPS survey topics	Domains
Communication with doctors	Composite
Communication with nurses	Composite
Responsiveness of hospital staff	Composite
Communication about medicines	Composite
Care transition	Composite
Cleanliness of hospital environment	Individual
Quietness of hospital environment	Individual
Discharge information	Composite
Overall hospital rating	Global
Likelihood to recommend	Global

The HCAHPS survey allows objective and meaningful comparisons of a hospital's quality performance (CMS, 2020). The following section of the chapter will review literature related to HCAHPS domains of communication with nurses, the responsiveness of hospital staff, and the hospital environment's cleanliness, which are the IVs chosen for this study.

## Communication With Nurses

The HCAHPS composite of communication with nurses contains the following questions:

1. During this hospital stay, how often did nurses treat you with courtesy and respect?
2. During this hospital stay, how often did nurses listen carefully to you?
3. During this hospital stay, how often did nurses explain things in a way you could understand?

Faloon et al. (2018) explain how ineffective communication largely contributes to adverse events in acute care hospitals. Digital communication technology is integrated into care delivery processes. Effective communication that is congruent and timely enhances the patient's experience and clinical outcomes. Nowak et al. (2019) conducted a cross-sectional survey to analyze the association between hospital structure, care delivery processes, and patient experience with discharge preparation. The study showed that patients felt better prepared for discharge in hospitals that proactively engaged patients in care plans and communicated anticipated discharge dates promptly. Hospital structures, size, teaching status, and ownership were not associated with the patient's experiences for discharge (Nowak et al., 2019).

A hospital culture that encourages open communication allows nurses and other healthcare professionals to provide constructive feedback on care delivery.

Multidisciplinary team sessions, safety huddles, bedside shift reports, purposeful rounding, and debriefing exemplify structured communication. Effective communication

increases information dissemination, and compliance with treatment regimens, improving patient safety and clinical outcomes (Paulus & Stout, 2019). Patient experience is multifactorial and involves patients, families, healthcare professionals, providers, and regulatory agencies to effect meaningful changes in care delivery.

### **Responsiveness of Hospital Staff**

The responsiveness of hospital staff is related to elements of care that may prevent adverse events. The staff's caring attitude and responsiveness to patient needs contribute to favorable ratings on the HCAHPS survey (Wei, 2020). The HCAHPS composite domain on the responsiveness of hospital staff includes the following questions:

1. During this hospital stay, after you pressed the call button, how often did you get help as soon as you wanted it?
2. During this hospital stay, did you need help from nurses or other hospital staff in getting to the bathroom or using a bedpan?
3. How often did you get help getting to the bathroom or using a bedpan as soon as you wanted?

Wyatt (2019) expounds on hourly rounding, bedside shift report, and linking patient call light systems to care team portable phones as best practices to improve the responsiveness of hospital staff. The Hospital staffing matrix must account for patient acuity and make provisions for patients without the capacity to call for help. Diwan et al. (2020) and Freudemberger et al. (2018) elaborate on the need to focus on the responsiveness of hospital staff, effective communication, and feedback to improve



quality, safety, and outcome measures. Staff engagement in care delivery, routine competency checks, and provide timely feedback to guide improvement. Additionally, Interdisciplinary communication and collaborative decision-making facilitate safe care.

### **Cleanliness of Hospital Environment**

The cleanliness of the hospital environment is an HCAHPS individual domain that contains the following question:

1. During this hospital stay, how often were your room and bathroom cleaned?

Scientific evidence shows that hospital environments, such as surfaces and medical equipment, maybe a reservoir for many pathogens, and healthcare workers play a crucial role in reducing the risk of cross-contamination of pathogens (Facciola et al., 2019; Mitchell et al., 2019). Higher HCAHPS scores on the cleanliness of the hospital environment could be associated with lower CLABSI rates. Durant (2020) performed a random-effects regression analysis and found that patient perceptions of cleanliness may reflect microbial cleanliness. The HCAHPS measures could assist in HAIs prevention, but further research is needed (Durant, 2020).

Hospital leadership plays a significant role in supporting the IPC plan and risk assessment by providing resources and mitigating barriers. Environmental cleaning policy and procedures must focus on optimal cleaning products, techniques, staff training, audits, feedback, and action plans (Mitchell et al., 2019). Previous studies show that staff behavior, ineffective communication, and knowledge deficit negatively impact IPC practices and patient experience in acute care hospitals (Harris et al., 2017).

## Summary and Conclusions

This quantitative study explored the relationship between hospital characteristics, patient experience, and CLABSI rates in nonprofit acute care hospitals in the United States. The Donabedian SPO model was the theoretical framework chosen for this research. The CLABSI prevalence remains a patient safety concern, notwithstanding national initiatives to reduce HAIs. Expertise in quality improvement unravels the complexity of interpreting CLABSI, HCAHPS risk-adjusted data, and public policy (Saint et al., 2019). The HAIs are associated with medical procedures, antibiotic use, organizational factors, patient characteristics, behaviors of healthcare providers, and their interactions with the healthcare system (Healthy people 2020, 2019).

Hospital ownership and teaching status are associated with the type of control, resources, medical expertise, and population health initiatives. Organizational culture of safety improve quality and outcome measures and reduce health care cost (Daras et al., 2018). Hospital structure may be associated with CLABSI rates identified as outcome quality measures. The IVs are patient experience scores of communications with nurses, the responsiveness of hospital staff, and the cleanliness of the hospital environment measured separately through HCAHPS scores. Patient's perception of the cleanliness of the hospital environment may impact CLABSI rates.

Previous studies demonstrate a positive relationship between patient experience and outcome measures (Esposito et al., 2017; Nowak et al., 2019; Paulus & Stout, 2019). Healthcare providers engage patients and their families through dialogue. Renedo et al.

(2018) explain how new knowledge is created through the patient-provider relationship. The concord of objective and subjective views impacts the patient's experience of care. The CMS, HVBP, employs specific quality metrics to compare, reimburse, and penalize hospitals based on quality performance. Few quantitative studies examine the relationship between organizational structure, quality metrics, and clinical outcome measures (Owens et al., 2017).

The construct that patient experience measures predict hospital quality is still debated. Effective communication is critical in healthcare, as communication gaps can lead to adverse events. Care delivery models that incorporate patient safety, teamwork, collaboration, and communication influence patient safety and the patient experience (Harris et al., 2017). The HCAHPS domains of communications with nurses and the responsiveness of hospital staff review clinicians' interactions with patients. Additionally, planned behavior empowers patients to hold healthcare professionals accountable for hand hygiene compliance and CLABSI prevention (Suttle et al., 2019).

The literature review demonstrated a gap in the literature regarding the relationship between specific hospital characteristics, patient experience of care, and CLABSI rates. Further research was recommended for empirical evidence on the relationship between patient experience measured through HCAHPS and clinical outcomes (Durant, 2020; Woodward & Umberger, 2016; Wilbers, 2018). This study seeks to fill the identified gap in the literature on the relationship between three specific IVs that highlight the importance of nurse communication, responsiveness of hospital staff, and room cleanliness with CLABSI rates in nonprofit hospitals in the United States.

The research design, rationale, methodology, threats to validity, and a summary were included in chapter 3.

## Chapter 3: Research Method

### **Introduction**

The purpose of this retrospective correlational study was to explore the relationship between patient experience of care measured through the HCAHPS survey and clinical outcome measured through CLABSI rates in nonprofit acute care hospitals in the United States. The research design and rationale, research variables, population, sampling procedures, and power analysis are covered in this chapter. The data collection method, operationalization of variables, data analysis plan, research question, and hypotheses are also discussed. Lastly, threats to validity and ethical concerns are conferred in this methodology chapter.

### **Research Design and Rationale**

Three domains of HCAHPS top box scores were the IVs selected for this study: nurse communication, the responsiveness of hospital staff, and room cleanliness. Effective communication and prompt responsiveness by the hospital staff improve care delivery processes. The DV was CLABSI hospital rates, which is an outcome measure. A multiple linear correlation analysis was completed to assess whether a significant correlation existed between CLABSI rates and patients' perception of hospital room cleanliness, nurses' communication, and hospital staff responsiveness. Surveys are used for data collection, and multiple linear regression is completed to explore the relationship between variables (Siedlecki, 2020). Additionally, a cross-sectional design is frequently used to analyze data such as surveys and represents the variables at one point (Riman et

al., 2023; Siedlecki, 2020; Wei et al., 2020) A correlational study does not show causal inferences (Bloomfield & Fisher, 2019).

### **Research Question and Hypotheses**

The following research question and hypotheses guided the study:

Research question: Is there a relationship between patient experience measured through HCAHPS scores of room cleanliness, communication with nurses, responsiveness of hospital staff, and standardized infection ratios for central-line-associated bloodstream infections in nonprofit acute care hospitals in the United States?

H<sub>0</sub>: There is no relationship between patient experience measured through HCAHPS scores of room cleanliness, communication with nurses, responsiveness of hospital staff, and standardized infection ratios for central-line-associated bloodstream infections in nonprofit acute care hospitals in the United States.

H<sub>a</sub>: There is a significant relationship between patient experience measured through HCAHPS scores of room cleanliness, communication with nurses, responsiveness of hospital staff, and standardized infection ratios for central-line-associated bloodstream infections in nonprofit acute care hospitals in the United States.

**Time and Resource Constraints**

There were minimal time and resource constraints to account for, particularly because secondary archival data were publicly available. Publicly accessible databases were used for this study, and no specific permission was required to access, analyze, and use the results for this study. Additionally, archived data were stored on the Hospital Compare website and did not pose any time constraints.

**Relationship to Previous Design Choices**

A correlational design uses numerical data to statistically explore the relationship between variables. Jae et al. (2021) conducted a cross-sectional quantitative correlational study to examine levels of job stress, perceptions of patient safety culture, and patient safety nursing activities. Previous studies utilized multiple regression analysis in determining the relationship between HCAHPS scores and quality indicators in acute care hospitals. Additionally, Wei et al. (2020) conducted a correlational study that showed a significant relationship between nurses' daily care actions and HCAHPS scores. Chen et al. (2020) expounded on acute care hospital quality data provided by the Hospital Compare database and accurate reflection on outcomes measures.

Haley et al. (2017) used secondary data to examine the impact of patient experience on quality outcomes. The results demonstrated a significant and positive association between patient experience of care and outcome measures (Haley et al., 2017). Substantial literature highlights the importance of patient experience data to evaluate clinical practice. Eamranond et al. (2020) illustrated the importance of quality improvement and systemic approaches to improve process and outcome measures.

This study built on these results by including HCAHPS scores as a proxy for patient safety. Nonprofit hospitals represent the largest category of hospitals in the United States and comprise teaching and nonteaching status. Hospital characteristics depict the settings where health care is provided. The hospital structure impacts care delivery, patients' perception of care, and clinical outcomes. Higher scores on HCAHPS domains of communication with nurses, responsiveness of hospital staff, and cleanliness of the hospital environment may be associated with lower CLABSI rates.

Mandated reporting of quality measures impacts reimbursement through HVBP. Previous research on healthcare quality predominately focused on a few states, unlike this study, which focused on the whole of the United States. The study was built on the knowledge that linked structure, the process of care delivery, and outcome measures. Quality improvement and patient safety programs focus on reducing HAIs to improve patient outcomes, quality measures, and reimbursement under the HVBP reimbursement program.

## **Methodology**

### **Population**

The target population was patients who completed the HCAHPS survey after discharge from nonprofit hospitals in the United States between January 1, 2019, and December 31, 2019. The HCAHPS survey is administered to a random sample of adult patients across medical conditions between 48 hours and 6 weeks after discharge. The population in this study consisted of patients discharged from 2,968 nonprofit teaching



and nonteaching hospitals in the United States. The nature and purpose of the research aligned with the quantitative research method and the study's rigor.

### **Sampling and Sampling Procedures**

The unit of analysis for this study was defined as a patient who completed the HCAHPS survey in a nonprofit acute care hospital in 2019. The patients included in the study responded *always* to the HCAHPS survey items comprised in this study. The "top box" response is *always*, which is the most positive response to HCAHPS survey items. Patients who responded *usually* (middle box) and those who responded *sometimes or never* (bottom box) for the HCAHPS survey questions were excluded from the study.

Nonprofit hospitals with complete IVs and DV datasets available on the hospital compare website were included in this study. The model shares the characteristics of the population from which it was drawn. Nonprofit hospitals that did not have complete 2019 HCAHPS and CLABSI data reported on Hospital Compare were excluded. The HCAHPS scores vary based on survey response rate and hospital size (Rodriguez-Homs et al., 2020). While many patients completed the HCAHPS survey, the aggregated result for each nonprofit hospital was used.

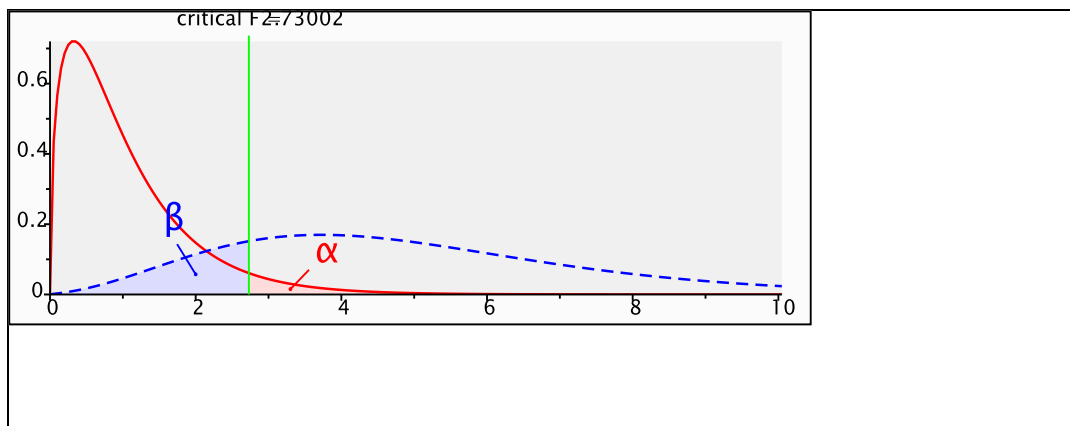
Probability sampling was used to provide an equal chance of being included in the sample (EL-Masri, 2017). Sample size calculation is critical to avoid Type I and Type II errors in conducting a research study. A Type I error rejects a null hypothesis when it is accurate. A confidence level of 0.80 and a margin error of .05 was selected because these parameters are commonly used for quantitative studies (G\*Power Statistical Power Analyses, 2021). The sample size was calculated using the G\*Power software version

3.1.9.7, a free online power analysis program used for various statistical tests, as demonstrated by Faul (2009) and Kang (2021).

A priori analysis was conducted using G\*Power version 3.1.9.7 to calculate the minimum required sample size, which was necessary to determine the effect size, desired alpha level, and power level (Faul, 2009; Kang, 2021). A priori analysis provides a method for controlling for Type I and II errors to prove a hypothesis. Results indicated that the required sample size to achieve 80% power for detecting a medium effect, at a significance criterion of  $\alpha = 0.05$ , of  $N = 77$ , was adequate to test the study hypothesis as illustrated in Figure 4.

**Figure 4**

*A Priori: Compute Required Sample Size*



*F* tests—Linear multiple regression: Fixed model,  $R^2$  deviation from zero

Analysis: A priori: Compute required sample size

Input: Effect size  $f^2$  = 0.15

$\alpha$  err prob = 0.05

	Power (1- $\beta$ err prob)	= 0.80
	Number of predictors	= 3
Output:	Noncentrality parameter $\lambda$	= 11.5500000
	Critical $F$	= 2.7300187
	Numerator $df$	= 3
	Denominator $df$	= 73
	Total sample size	= 77
	Actual power	= 0.8017655

### **Pilot Study**

A pilot study can be conducted to check assumptions and test statistical models that underpin multiple linear regression (Hickey et al., 2019). In a quantitative study, a pilot study can be used to test the reliability and validity of the research instrument, such as a questionnaire or test, to refine the research procedures, and to estimate the sample size needed for the complete study. The main difference between a pilot study and a main study is that the pilot study is the initial step of the entire research protocol and is often a smaller sized study that assists in planning and modifying the main study. The pilot study provides necessary information for calculating sample size and assessing all aspects of the main study, thus minimizing unnecessary effort, time, and resources.

### **Archival Data Collection**

The DV and IV databases were accessible from the Hospital Compare website. The Hospital Compare website is published by CMS; as a standard database for hospitals nationwide, it is considered the primary source for these data. The data are available to

the public, and no permission is required for access. I accessed archival data for 2019

HCAHPS survey results and hospital CLABSI rates.

The variable names and descriptions included in this database are shown in Table 2.

**Table 2**

*Independent and Dependent Variables*

		Independent variables			
Facility ID	HCAHPS question	HCAHPS answer description	HCAHPS answer percent	Start date	End date
		Patients who reported that their nurses "always" communicated well	Nurses "always" communicated well		
Patients who reported that they "always" received help as soon as they wanted	Patients "always" received help as soon as they wanted		1/1/2019	12/31/2019	
Patients who reported that their room and bathroom were "always" clean	Room was "always" clean		1/1/2019	12/31/2019	
Dependent variable					
Facility ID	Measure ID	Measure name	Score	Start date	End date
	HAI_1_SIR	Central-line-associated bloodstream infection (ICU + select wards)		1/1/2019	12/31/2019

Additionally, I obtained nonprofit hospital characteristic data from the AHD website. The AHD hospital profile include hospital identification characteristics that

comprise CMS certification number; similarly referred to as facility identification on the Hospital Compare website. However, in this study, the CMS certification number/facility identification was not published. Sequential numbering was done to maintain privacy for the healthcare facilities.

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

The HCAHPS is a national standardized survey measuring patients' hospital experience. The HCAHPS survey, developed in 2002 by CMS and the AHRQ, was the first national, standardized, publicly reported survey of patients' perspectives of hospital care. The AHRQ conducted a rigorous scientific process to develop and test the HCAHPS instrument through public participation, literature review, cognitive interviews, consumer testing, and focus groups. Additionally, CMS (2019) responded to hundreds of public comments generated by several Federal Register notices.

The HCAHPS is a validated survey instrument composed of 29 items that measure 10 domains (six composite measures, two individual items, and two global items). The six composite measures are constructed from two or three survey questions. Nurse communication and responsiveness of hospital staff are composite measures, and the cleanliness of the hospital environment is an individual item on the HCAHPS survey. Closely related questions are combined into composites to increase the statistical reliability of the measures (CMS, 2021).

The HCAHPS is administered to a random sample of adult inpatients between 48 hours and 6 weeks after discharge. There are four approved modes of administration: mail, telephone, mixed (mail with telephone follow-up), and interactive voice response

(CMS, 2021). Hospital management and vendors play a significant role in HCAHPS implementation. The HCAHPS results are submitted to CMS, where scores are adjusted for the effects of patient mix and mode of survey administration. The CMS publicly publishes quarterly hospital-level HCAHPS data as percentages of top-box, bottom-box, and middle-box scores on the Hospital Compare website (CMS, 2019b). The benefits of survey design include cost-effectiveness and quick turnaround on data collection. CMS (2021) has published the HCAHPS survey's reliability, face, content, and construct validity.

### **Operationalization for Each Variable**

The research question was specific to the relationship between the IVs and DV.

- Nurse communication (IV, ratio): The percentage of patients who reported that their nurses constantly communicated well.
- Cleanliness of the hospital environment (IV, ratio): The percentage of patients who reported that their room and bathroom were always clean.
- Responsiveness of hospital staff (IV, ratio): The percentage of patients reporting that hospital staff provided help promptly.
- CLABSI (DV, ratio): The standardized infection ratio of all central line-associated bloodstream infections acquired at the hospital.

### **Data Analysis Plan**

Part of the multiple linear regression data analysis process include ensuring that the required assumptions were met for multiple regression results to be valid (Hickey et al., 2019). Proper diagnostics mainly involve the difference between the observed and

model-fitted values (Hickey et al., 2019). Multiple linear regression assumptions include data normality, linearity, homoscedasticity, and the absence of multicollinearity (Hickey et al., 2019). The assumption tests for multiple regression diagnostics were completed as discussed by Hickey et al., 2019, to include the following:

- There are two or more IVs.
- Residuals are independent.
- A linear relationship between the DV and each independent variable.
- The data shows homoscedasticity.
- The data does not show multicollinearity.
- There are no extreme outliers.
- The residuals are approximately normally distributed.

The HCAHPS and CLABSI data accessed from the Hospital Compare website was checked for completeness before uploading it to IBM Statistical Package for the Social Sciences (SPSS) vs. 28. Hospitals missing data were excluded from the study. Multiple linear regression analysis was completed to explore the relationship between the three IVs and the DV (Bloomfield & Fisher, 2019).

### **Threats to Validity**

External validity refers to the ability of the results to be generalized to a larger population (Huebschmann et al., 2019). The results of this study may be limited to other countries due to different demographics and variability in healthcare systems. Multiple factors impact patient experience, and although patient-mix adjustments are made on

HCAHPS scores, hospital settings and other factors like staffing matrix and care delivery processes vary.

Internal validity describes the ability to make causal references regarding the relationship between the variables. No threats to internal validity were identified for this nonexperimental study. The study aimed to examine the relationship between patient experience of care and CLABSI rates and not to deduce causation between the variables. Regarding constructing validity, a potential threat was the accuracy of HCAHPS survey results to evaluate the quality of care.

### **Ethical Procedures**

The Institutional Review Board (IRB) approval complied with Walden University research ethical standards and US federal regulations. Agreed upon ethical considerations and practices guided the research. The IRB's ethics review and approval were required and obtained before data collection or dataset access. Although the study dealt with secondary data with no patient identifiers, the moral requirement was still essential. Hospitals inform patients about the survey, and participants willing to participate in the exercise are granted an opportunity since it is voluntary. In addition, some participants might have already agreed to complete the survey but later changed their minds, and others did not respond.

The other crucial ethical consideration was the confidentiality and privacy of the obtained information. After data collection procedures were complete, no hospital data was released without consent. All the information and data was kept in a safe place until the research was finished, then they are destroyed. Furthermore, the research was not



plagiarized, and the work done by former researchers in this field is respected. As a result, any new information in the study was adequately referenced.

### **Conclusion**

A quantitative, correlational research design was chosen for this study. Archival data for 2019 HCAHPS scores and CLABSI rates from the CMS Hospital Compare website were statistically analyzed to answer the research question and test the hypothesis. Data collection involved random sampling of all nonprofit acute care hospitals in the United States. Those hospitals with complete data on the DV (CLABSIs) and the IVs of nurse communication, the responsiveness of hospital staff, and the cleanliness of the hospital environment from HCAHPS surveys were included. A pilot study checked compliance with multiple regression assumptions before applying multiple regression models for statistical data analysis. Chapter 4 includes a report on the multiple regression assumptions, data collection, analysis, results, and a summary.

## Chapter 4: Results

### Introduction

Overall, the hospital structure and process of care delivery influence outcome measures. The feedback on patient experience obtained through the HCAHPS survey provides pertinent information that may guide quality improvement. This quantitative study explored the relationship between the HCAHPS top box scores for room cleanliness, nurse communication, and responsiveness of hospital staff and CLABSI rates in nonprofit acute care hospitals in the United States. This chapter describes data collection methods, statistical assumptions, and final parametric tests.

The research question and corresponding hypothesis for the study are as follows:

Research question: Is there a relationship between patient experience

measured through HCAHPS scores of room cleanliness, communication with nurses, the responsiveness of hospital staff, and standardized infection ratios for central-line-associated bloodstream infections in nonprofit acute care hospitals in the United States?

H<sub>0</sub>: There is no relationship between patient experience measured through HCAHPS scores of room cleanliness, communication with nurses, responsiveness of hospital staff, and standardized infection ratios for central-line-associated bloodstream infections in nonprofit acute care hospitals in the United States.

Ha: There is a significant relationship between patient experience measured through HCAHPS scores of room cleanliness, communication with nurses, the responsiveness of hospital staff, and standardized infection ratios for central-line-associated bloodstream infections in nonprofit acute care hospitals in the United States.

### **Data Collection**

Archival datasets for January 1, 2019, to December 31, 2019, were accessed from the public Hospital Compare website. The datasets included IVs of HCAHPS scores of room cleanliness, nurse communication, and responsiveness of hospital staff, together with the DV of CLABSI rates. The facility ID associated with datasets from the Hospital Compare websites were used to identify nonprofit hospital characteristics in the AHD.

The data collection process was consistent with the methods outlined in Chapter 3. Initially, 4,728 hospitals were included in the Hospital Compare datasets, of which only 2,802 hospitals (59%) contained all HCAHP domain scores and CLABSI data. Among the hospitals with completed surveys from discharged patients, 70% were nonprofit acute care hospitals, translating to at least N=1,956. Nonprofit acute care hospitals with incomplete IV and DV datasets were excluded from the study. Random sampling was completed per the outlined methodology in Chapter 3. As previously demonstrated in a priori analysis, a minimum sample size of n=77 was adequate to test the study's null hypothesis. Archival data were collected from the CMS Hospital Compare website from 77 nonprofit acute care hospitals for the year 2019. Standard

multiple linear regression analysis was used to determine the relationship between hospital room cleanliness, nurse communication, and responsiveness of hospital staff as predictors for CLABSI rates.

### Descriptive Statistics

Descriptive statistics was used to explore data. The DV and IVs for the 77 nonprofit hospitals were analyzed using univariate measurements to assess the central tendency for continuous variables. Table 3 contains descriptive statistics for the study. The mean CLABSI SIR at the hospital level was  $M = .70$  ( $SD = .57$ ). The mean room cleanliness HCAHPS score for nonprofit acute care hospitals was  $M = 73$  ( $SD = 4.6$ ). The mean nurse communication score was  $M = .78$  ( $SD = 5.3$ ). The mean hospital staff responsiveness score was  $M = 64$  ( $SD = 4.9$ ).

**Table 3**

#### *Descriptive Statistics of Predictor Variables*

	<i>M</i>	<i>SD</i>	Min	Max
CLABSI SIR	.7031	.57849	.06	2.51
Room cleanliness	73.7922	4.62071	63.00	82.00
Nurse communication	78.5455	5.31271	68.00	94.00
Staff responsiveness	64.3377	4.94073	55.00	78.00

### Statistical Assumptions

Multiple linear regression is an important statistical modeling tool that relies on certain assumptions. The statistical model must be correctly developed to obtain reliable and generalizable results (Hickey et al., 2019). The eight assumptions required to be observed prior to a multiple linear regression being completed were met. The assumptions include (a) a continuous DV; (b) two or more IVs, either continuous or

categorical; (c) independence of observations; (d) a linear relationship between the IVs and the DV; (e) homoskedasticity; (f) no multicollinearity; (g) no significant outliers; and (h) normal distribution of residuals (Laerd Statistics, 2021). Preliminary analyses were carried out to assess whether assumptions were met. Both the DV and IVs met the assumptions of continuous data. The IVs are significantly differentiated, as evidenced by their means differences in Table 3.

A correlation matrix for the DV and IVs was constructed to evaluate the assumption of multicollinearity. The correlation coefficient magnitudes were less than 0.9, indicating that the assumption was met (Hickey et al., 2019). Due to the constructive nature of the HCAHPS survey, the HCAHPS composite scores being significantly correlated is consistent with the literature. No significant correlations were found; therefore, linearity was not violated, as demonstrated in Table 4. Room cleanliness ( $p < .001$ ), nurse communication ( $p < .001$ ), and staff responsiveness ( $p = .864$ ).

**Table 4**

*Pearson Correlation*

	CLABSI SIR	Nurse communication	Staff responsiveness	Room cleanliness
CLABSI SIR	1.000	-.407	-.388	-.379
Room cleanliness	-.407	1.000	.389	.304
Nurse communication	-.388	.389	1.000	.292
Staff responsiveness	-.379	.304	.292	1.000

Multicollinearity was assessed by reviewing the correlation coefficients (see Table 5). The correlation coefficient magnitudes were less than 0.9, indicating that the

multicollinearity violation was not apparent (Hickey et al., 2019). There were no IVs with a tolerance value less than 0.1. The coefficient of correlation showed variance inflation factor (VIF) less than 1.1 for all the variables. Notwithstanding, the correlation between two IVs with  $VIF > 5$ ) is considered to be highly correlated (Marcoulides & Raykov, 2019).

**Table 5**

*Coefficients of Correlation*

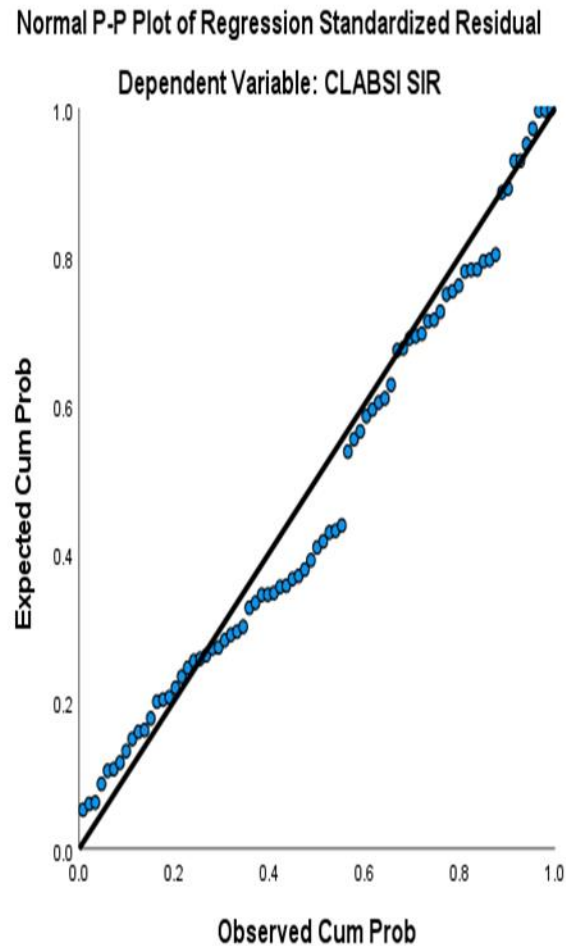
Model	Unstandardized coefficients		Standardized coefficients		Sig	Collinearity statistics	
	B	Std error	Beta	t		Tolerance	VIF
1 (Constant)	7.477	1.406		5.318	0.000		
Nurse communication	-0.043	0.011	-0.395	-4.046	0.000	0.981	1.020
Room cleanliness	-0.044	0.012	-0.354	-3.609	0.001	0.970	1.031
Staff responsiveness	-0.002	0.011	-0.016	-0.163	0.871	0.989	1.011

*Note.* Dependent variable: CLABSI SIR.

Assumptions of normality, linearity, and homoscedasticity were checked by examining the normal probability plot (P-P) of the regressed standardized residual (see Figure 5) and the scatterplot of the standardized residuals (see Figure 6). A visual review of P-P plots confirmed a normal distribution of residues. Linearity was not violated, as demonstrated by the scatterplot. The points are randomly scattered with no apparent pattern. The homoscedasticity assumption was also met. There was no difference in the spread of residual. Similarly, the residual statistics showed a maximum Cook's distance of .285, far less than the value of 1. Therefore, there were no problematic cases in the sample.

**Figure 5**

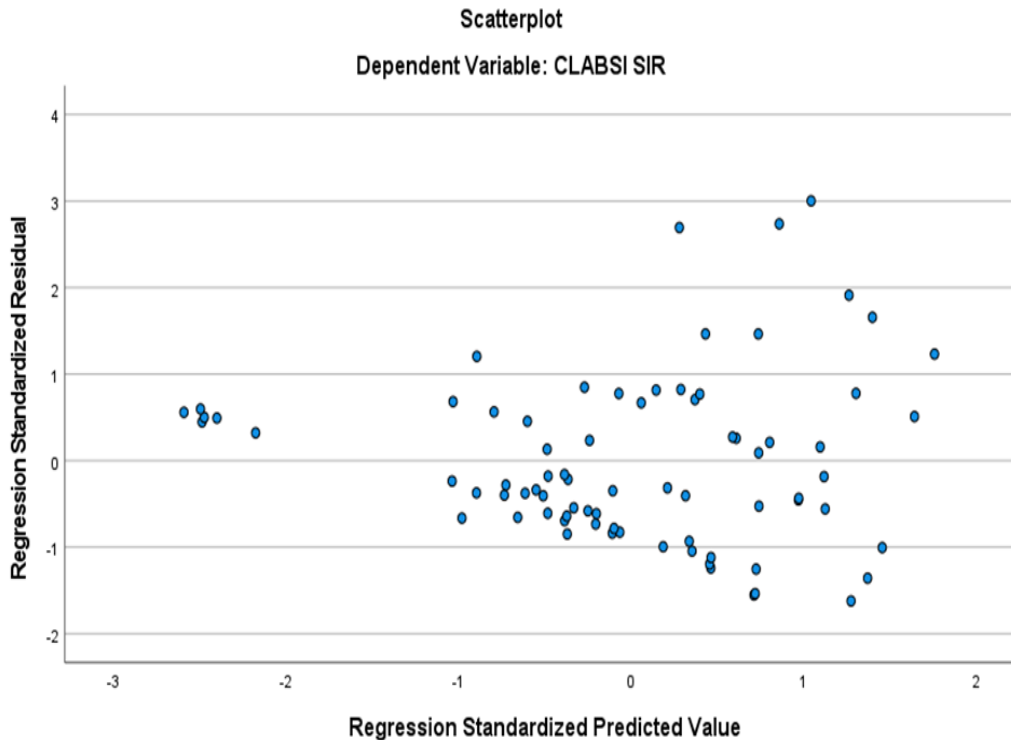
*Normal Probability Plot of Standardized Model Residuals*



The scatterplot of the standardized predicted values versus the standardized residuals suggested violation of homoscedensity. The funnel-shaped plot could be accounted for because the data values could not be less than 0. However, data transformation was completed using SPSS statistics.

**Figure 6**

*Scatterplot of the Standardized Residuals*



As previously specified, initial analyses were conducted to assess whether the assumptions of multicollinearity, outliers, normality, linearity, and homoscedasticity were met; no violations were noted. After that, one-way analysis of variance (ANOVA) was performed for the difference between the means. The  $F$ -ratio in the ANOVA tests whether the overall regression model is a good fit for the data. The ANOVA (see Table 6) shows that the IVs statistically significantly predict the DV ( $F_{3,73} = 11.413$ ,  $P = < .0001$ ). The multiple linear regression model was deemed fit for data analysis.



**Table 6***Analysis of Variance*

Model	Sum of squares	df	Mean square	F	Sig.
Regression	8.120	3	2.707	11.413	< .001 <sup>a</sup>
Residual	17.313	73	0.237		
Total	25.434	76			

Note. Dependent variable: CLABSI SIR.

<sup>a</sup> Predictors: (Constant), Staff responsiveness, Nurse communication, Room cleanliness.

### Multiple Linear Regression Analysis

Standard multiple linear regression was used to answer the research question. All the statistical tests were conducted at 80% statistical significance. The analysis was completed with the statistical software SPSS version 28. All the IVs were entered concurrently and accounted for 31.9% of the variance in CLABSI rates ( $R^2$  change = .319,  $F$  change = 11.413,  $P = <.001$ ; Table 7). Subsequently, the model was found fit for the data.

**Table 7***Model Summary of the Regression*

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std error of the estimate	R <sup>2</sup> change	F change	df1	df2	Sig F change
1	.565 <sup>a</sup>	0.319	0.219	0.48700	0.319	11.413	3	73	< .001

Note. Dependent variable: CLABSI SIR.

<sup>a</sup> Predictors (Constant): Staff responsiveness, Nurse communication, Room cleanliness.

**Table 8***Multiple Regression Coefficients for CLABSI Rates Regressed on Independent Variables*

Model	Unstandardized	Standardized		<i>t</i>	Sig.
	B	Std. error	Beta		
Constant	7.482	1.404		5.330	< .001
Nurse communication	-0.043	0.011	-0.394	-4.046	< .001
Room cleanliness	-0.044	0.012	-0.355	-3.619	< .001
Staff responsiveness	-0.002	0.011	-0.017	-0.172	0.864

The standard multiple linear regression was conducted with all the IVs added together. The IVs of nurse communication were significantly associated with CLABSI ratio variance ( $\beta = -.043$ ;  $p < .001$ ). Moreover, room cleanliness was statistically correlated with changes in DV ( $\beta = -.044$ ;  $p < .001$ ). However, staff responsiveness was insignificant in multiple linear regression model testing ( $\beta = -.002$ ;  $p < .864$ ).

### **Research Question and Hypotheses**

Results were analyzed concerning the research question: Is there a relationship between patient experience measured through HCAHPS scores of room cleanliness, communication with nurses, the responsiveness of hospital staff, and standardized infection ratios for central-line-associated bloodstream infections in nonprofit acute care hospitals in the United States? In the multiple linear regression model, out of the three hypothesized IVs, only nurse communication and room cleanliness were significant predictors of CLABSI rates. I rejected the null hypothesis when reviewing the overall research question.

### **Summary of Findings**

The research study explored the relationship between patient experience of care as measured by three domains of HCAHPS scores and CLABSI rate in nonprofit acute care hospitals in the United States. The results showed that communication with nurses and

room cleanliness, measured by HCAHPS scores, predict CLABSI rates in acute care nonprofit hospitals in the United States. Statistical analysis  $F(3,73) = 11.413, p < .001, R^2 = .319$ . Two of three hypothesized IVs (nurse communication and room cleanliness) significantly predict CLABSI rates. Therefore, I rejected the null hypothesis in consideration of the alternative hypothesis.

The two IVs correlated with CLABSI rates were nurse communication and hospital room cleanliness. These variables depend highly on the hospital culture of patient safety and quality care. Effective nurse communication enhances care coordination through patient engagement in care delivery processes. Structured processes like bedside shift reports, hourly rounding, and interdisciplinary team approach provide a chance to engage patients in their care. For instance, daily CHG bathing for patients with central lines helps to prevent CLABSI (Destiny et al., 2023). The hospital room cleanliness is associated with reduced microbial contamination and subsequent reduced risk for CLABSI. Notably, no statistically significant correlation was found between staff responsiveness and CLABSI rates.

The research finding may denote an emphasis on quality versus quantity of care. For example, nurse communication systems improve connectivity through interface with medical equipment and care team portable phones for real-time interventions. Although staff responsiveness may designate safety issues in the clinical environment, it is not a direct cause. CLABSI prevention includes following tailored EBP and guidelines for clinical indication for central line insertion, care, and maintenance. Nurses' compliance with the CLABSI care bundle and following a checklist guideline that details actions

before, during, and after central line insertion is critical to reducing CLABSI infection rates (Destiny et al., 2023). The CDC established the central line maintenance care bundles in 2011 (Connor et al., 2023).

The data source posed a possible limitation as bias may have existed in the kind of participants who responded to the HCAHPS survey. Moreover, scoring limited the study, as some hospitals were removed from the dataset because of missing data related to the selected IVs and DV. Only hospitals with complete datasets were included in the random sampling process. I removed variables with outliers from the datasets as the values posed a potential limitation on the study. A broad spectrum of demographics that captured data responses from the survey was used in this study. Descriptive statistics, the data analysis procedures, the results of the data analysis, and a summary were included in Chapter 4. Consequently, a discussion of the findings and recommendations for future research and practice are covered in Chapter 5.

## Chapter 5: Discussion, Conclusions, and Recommendations

### Introduction

This cross-sectional quantitative study explored the relationship between patient experience of care as measured by HCAHPS survey scores and CLABSI rates in nonprofit acute care hospitals in the United States. Publicly accessible datasets from the Hospital Compare website for 2019 HCAHPS and CLABSI rates at the hospital level were used in this study. Through this study, I aimed to fill a gap in the literature regarding the relationship between patient experience of care and outcome measures. Multiple linear regression analysis showed a statistically significant relationship between HCAHPS scores of nurse communication ( $\beta = -.043$ ;  $p < .001$ ) and room cleanliness ( $\beta = -.044$ ;  $p < .001$ ) as predictors of CLABSI rates. No significant association ( $\beta = -.002$ ;  $p < .864$ ) was found between the HCAHPS scores of staff responsiveness and CLABSI rates. This study contributes to the empirical evidence on the relationship between patient experience scores on nurse communication and room cleanliness with clinical outcomes of CLABSI rates in acute care hospitals.

### Interpretation of the Findings

The multiple regression analysis results indicated that the model significantly predicts CLABSI rates for 2019,  $F(3,73) = 11.413$ ,  $p < .001$ , and  $R^2 = .319$ . In the final model, two IVs significantly predicted CLABSI rates. Room cleanliness and nurse communication significantly negatively correlated with the CLABSI rates. Nurse communication ( $\beta = -.043$ ,  $t = -4.046$ ,  $p = .000$ ) contributed more to the model than room cleanliness ( $\beta = -.044$ ,  $t = -3.609$ ,  $p = .001$ ). The responsiveness of the hospital staff did

not show any statistically significant relationship with CLABSI rates ( $\beta = -.002$ ,  $t = -.163$ ,  $p = .871$ ).

Higher HCAHPS scores are associated with improved clinical outcomes (AHRQ, 2021). The analysis from this study produces a practical, broad, and comprehensive approach to understanding how HCAHPS scores correlate with clinical outcomes. Dagley (2023) elaborated on how HCAHPS scores correlate with hospital quality measures. This study has the potential to enhance quality and patients' safety.

The results of this study are consistent with existing literature. Han et al. (2023) explained how patient experience measured through HCAHPS provides pertinent information that guides quality improvement. Cleanliness of the hospital environment and patient-centered care advance safety and clinical outcomes that include CLABSI rates (Kemp et al., 2023). A systematic approach to infection prevention, EBP, education, central line bundle care, auditing, and multidisciplinary teams improve CLABSI prevention (Orozco-Santana et al., 2023). National datasets were used in this study, and the results showed that patient experience was significantly associated with CLABSI rates. Hospitals with lower HCAHPS scores on nurse communication and room cleanliness are at an increased risk for CLABSIs. Nurses play a vital role in the healthcare ecosystem, and the findings of this study can aid providers in designing tailored interventions that improve patient experience and outcome measures.

CLABSIs are common and preventable HAIs related to patient mortality, increased inpatient length of stay, readmission, and high cost of healthcare (Lopes et al., 2021). The hospital structure and care delivery process influence clinical outcomes in

acute care hospitals (Constable, 2022). Clinical outcome measures and patient experiences impact a hospital's competitiveness and financial viability (Kemp et al., 2023). HVBP adjusts the hospital payment system based on healthcare quality data (Constable, 2022).

### **Relevance to Donabedian Structure-Process-Outcome Model**

The Donabedian SPO theory was the theoretical framework for this correlational study. Hospital infrastructure includes physical space related to care delivery, governance, medical equipment, information technology, standardized operational procedures, quality control, human capital, and financial system. The hospital structure impacts care delivery processes and, ultimately, outcome measures. Hospital resources are required to maintain adequate staffing levels, the environment of care, and best practice models (Torres et al., 2023). Nurse communication is vital to care delivery processes and clinical outcomes (Dagley, 2023). Nurses are expected to adhere to organizations' policies and procedures. Nurses' knowledge about patient safety and standardization of the care processes promotes and mitigates adherence to infection prevention practices. Implementing EBP such as central line care bundles prevents CLABSIs and improves patient experience and clinical outcomes (Chovanec et al., 2021). Continuous assessment of the organization's structure, processes, and outcomes is critical to performance improvement and value-based care. Donabedian's lasting framework for healthcare quality is relevant to this study.

## **Limitations of the Study**

Secondary data provide a wealth of information that might be difficult or expensive to collect directly. However, there are several limitations associated with their use, such as those involving quality, accuracy, and control of data collection. While these limitations exist, secondary data still represent a valuable resource for researchers. The key is understanding these limitations and carefully considering their potential impacts when designing a study and interpreting the results.

### **Quality and Accuracy**

There may be uncertainties regarding the quality or accuracy of data. If the data collection methodology is flawed or not rigorously controlled, this can also affect the reliability of the findings. However, the HCAHPS survey instrument is structured and does not allow for open-ended responses.

### **Lack of Control Over Data Collection**

Because researchers using secondary data have not collected the data themselves, they have no control over what data were collected, how they were collected, or from whom they were collected. The HCAHPS survey depends on self-report, and the responses are susceptible to recall and social desirability bias. This scenario can limit the questions they can answer. The study results could be more generalizable due to the specific context in which the study was conducted. However, the patient's perspectives on care survey focused on U.S. acute care hospitals.



## **Recommendations**

Hospital administrators should focus on modifiable hospital characteristics to improve efficiency, patient experience, and clinical outcomes. Hospital employees must be educated on the concord of care delivery, patient experience, and outcome measures. Implementation of central line care bundles, continued education, performance review, and data-driven quality improvement initiatives are recommended. Stakeholders' engagement provides an opportunity for timely feedback and risk mitigation related to the hospital environment and care delivery processes.

In acute care hospitals, nurses are entrusted with care coordination, management, and clinical leadership (Oldland et al., 2020). Notwithstanding, nurses, among other healthcare professionals, have the most significant patient contact time related to 24-hours-a-day nursing care delivery. The rapidly changing healthcare landscape is compounded with issues related to the shortage of nurses, workload, and burnout (Liu et al., 2018; Riman et al., 2023). Nurse staffing levels are operational hospital characteristics that impact care delivery and outcome measures (Al-Amin, 2018). Providers should leverage resources and consistently provide safe and quality health care. Further research is recommended to explore the relationship between nurse-to-patient ratio, patient experience of care, and clinical outcomes in acute care hospitals.

## **Implications**

### **Positive Social Change**

Positive social change implications of this study include an opportunity for public health policymakers and hospital leaders to understand the importance of maintaining

hospital cleanliness and effective nurse communication to reduce CLABSI rates. Patient experience, safety, and quality measures impact financial reimbursement under the HVBP (Park et al., 2020). Hospitals are encouraged to compare their CLABSI ratings and engage multidisciplinary teams to identify opportunities for process improvement. Patients' involvement in their care, environmental cleanliness, and nurse communication are keys to CLABSI prevention in acute care hospitals. Patients and their families benefit from reduced risk for CLABSI associated with extended hospital stays, morbidity, mortality, and increased healthcare costs. This study may help in understanding the relationship between patient experience and CLABSI rates when evaluating the quality of care.

### **Theoretical Implications**

To achieve efficiency and effectiveness in health care provision, providers must incorporate the consumer's needs and align organizational structure and daily care process. Healthcare's quality and patient safety domains are multifaced and require an interdisciplinary team approach. Hospital resources, including multidisciplinary teams, must be aligned and provide quality care to achieve desired outcomes (Tossaint-Schoenmakers et al., 2021). In this study, nurse communication and room cleanliness were the two predictor variables significantly correlated with CLABSI rates. Notably, effective nurse communication assists patients in adhering to treatment plans, while room cleanliness denotes hospital hygiene and infection prevention practices. The World Health Organization has recommended that patients participate in their care by encouraging hand hygiene to prevent infections (Gesser-Edelsburg et al., 2020). In the

acute care setting, the nurses' role primarily preserves patient safety and prevents harm during care provision. Continuous assessment of the organization's structure, processes, and outcomes is critical to performance improvement and value-based care.

### **Implications for Practice**

The empirical evidence on the relationship between patient experience and outcome measures encourages hospitals to implement well-defined systems and processes of care to achieve and sustain desired safety, quality, and patient experience (Torres al., 2023). Hospitals aim to reduce costs, improve outcomes, and comply with regulatory agencies such as CMS. Therefore, hospital administrators must envision sustainable policies that transform modifiable hospital characteristics and upsurge patient experience of care and clinical outcomes. This research demonstrates that clean hospital rooms and effective nurse communication correlate with low CLABSI rates. Patient experience measured through the HCAHPS survey can be used to assess the quality of care in acute care hospitals.

### **Conclusion**

Patient experience and CLABSI rates are essential variables to healthcare reimbursement under the value-based purchase requirement of the PPACA. Grounded in Donabedian SPO theory, this cross-sectional quantitative study explored the relationship between patient experience of care as measured by HCAHPS survey scores and CLABSI rates in nonprofit acute care hospitals in the United States. This study adds to the literature on the importance of a culture of patient safety in preventing HAIs in acute care hospitals. This study found that nurse communication and room cleanliness, as assessed

by recently discharged inpatients, were associated with hospital CLABSI rates. Nurse communication and room cleanliness are proxy metrics for acute care hospitals' work environments and safety culture. Providers must continually engage patients and their families in making decisions pertinent to care delivery through meaningful interactions and effective communication (Harris et al., 2017).

Subsequently, the environment of care impacts quality and patient safety, a condition that conscripts a multifaceted approach to performance improvement. Scientific knowledge and proactive interventions by providers, clinicians, and hospital staff improve care delivery processes, patient experience, and clinical outcomes.

This quantitative correlational study contributes to the empirical evidence on the relationship between patient experience measured through the HCAHPS and CLABSI rates in nonprofit acute care hospitals in the United States. Hospitals with higher patient experience scores and low CLABSI rates gain a competitive advantage to attract and retain customers and receive financial reimbursement for sustainability.

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## Appendix: Hospital Consumer Assessment of Healthcare Providers and Systems Survey

<b>HCAHPS Survey</b>
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**SURVEY INSTRUCTIONS**

- ◆ You should only fill out this survey if you were the patient during the hospital stay named in the cover letter. Do not fill out this survey if you were not the patient.
- ◆ Answer all the questions by checking the box to the left of your answer.
- ◆ You are sometimes told to skip over some questions in this survey. When this happens you will see an arrow with a note that tells you what question to answer next, like this:
  - Yes
  - No → **If No, Go to Question 1**

***You may notice a number on the survey. This number is used to let us know if you returned your survey so we don't have to send you reminders.***  
***Please note: Questions 1-25 in this survey are part of a national initiative to measure the quality of care in hospitals. OMB #0938-0981***

Please answer the questions in this survey about your stay at the hospital named on the cover letter. Do not include any other hospital stays in your answers.

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**YOUR CARE FROM NURSES**

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1. During this hospital stay, how often did nurses treat you with courtesy and respect?

- 1 Never  
 2 Sometimes  
 3 Usually  
 4 Always

2. During this hospital stay, how often did nurses listen carefully to you?

- 1 Never  
 2 Sometimes  
 3 Usually  
 4 Always

3. During this hospital stay, how often did nurses explain things in a way you could understand?

- 1 Never  
 2 Sometimes  
 3 Usually  
 4 Always

4. During this hospital stay, after you pressed the call button, how often did you get help as soon as you wanted it?

- 1 Never  
 2 Sometimes  
 3 Usually  
 4 Always  
 9 I never pressed the call button

## YOUR CARE FROM DOCTORS

5. **During this hospital stay, how often did doctors treat you with courtesy and respect?**
6. <sup>1</sup>o Never  
<sup>2</sup>o Sometimes <sup>3</sup>o Usually <sup>4</sup>o Always
7. **During this hospital stay, how often did doctors listen carefully to you?**
- <sup>1</sup>o Never  
<sup>2</sup>o Sometimes <sup>3</sup>o Usually <sup>4</sup>o Always
8. **During this hospital stay, how often did doctors explain things in a way you could understand?**
- <sup>1</sup>o Never  
<sup>2</sup>o Sometimes <sup>3</sup>o Usually <sup>4</sup>o Always
- **THE HOSPITAL ENVIRONMENT**
9. **During this hospital stay, how often were your room and bathroom kept clean?**
- <sup>1</sup>o Never  
<sup>2</sup>o Sometimes <sup>3</sup>o Usually <sup>4</sup>o Always
10. **During this hospital stay, how often was the area around your room quiet at night?**
- <sup>1</sup>o Never  
<sup>2</sup>o Sometimes <sup>3</sup>o Usually <sup>4</sup>o Always



- **YOUR EXPERIENCES IN THIS HOSPITAL**

- 11. During this hospital stay, did you need help from nurses or other hospital staff in getting to the bathroom or in using a bedpan?**
- <sup>1</sup>o Yes  
<sup>2</sup>o No è If No, Go to Question 12
- 12. How often did you get help in getting to the bathroom or in using a bedpan as soon as you wanted?**
- <sup>1</sup>o Never  
<sup>2</sup>o Sometimes <sup>3</sup>o Usually <sup>4</sup>o Always
- 13. During this hospital stay, did you have any pain?**
- <sup>1</sup>o Yes  
<sup>2</sup>o No è If No, Go to Question 15
- 14. During this hospital stay, how often did hospital staff talk with you about how much pain you had?**
- <sup>1</sup>o Never  
<sup>2</sup>o Sometimes <sup>3</sup>o Usually <sup>4</sup>o Always
- 15. During this hospital stay, how often did hospital staff talk with you about how to treat your pain?**
- <sup>1</sup>o Never  
<sup>2</sup>o Sometimes <sup>3</sup>o Usually <sup>4</sup>o Always
- 16. Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?**
- <sup>1</sup>o Never  
<sup>2</sup>o Sometimes <sup>3</sup>o Usually <sup>4</sup>o Always
- 17. Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand?**
- <sup>1</sup>o Never

<sup>2</sup>o Sometimes <sup>3</sup>o Usually <sup>4</sup>o Always

• **WHEN YOU LEFT THE HOSPITAL**

**18. After you left the hospital, did you go directly to your own home to someone else's home, or to another health facility?**

<sup>1</sup>o Own home

<sup>2</sup>o Someone else's home

<sup>3</sup>o Another health

facility → **If Another, Go to Question 21**

**19. During this hospital stay, did doctors, nurses, or other hospital staff talk with you about whether you would have the help you needed when you left the hospital?**

<sup>1</sup>o Yes

<sup>2</sup>o No

**20. During this hospital stay, did you get information in writing about what symptoms or health problems to look out for after you left the hospital?**

<sup>1</sup>o Yes

<sup>2</sup>o No

• **OVERALL RATING OF HOSPITAL**

Please answer the following questions about your stay at the hospital named on the cover letter. Do not include any other hospital stays in your answers.

**21. Using any number from 0 to 10, where 0 is the worst hospital possible and 10 is the best hospital possible, what number would you use to rate this hospital during your stay?**

<sup>0</sup>o 0 Worst hospitals possible

<sup>1</sup>o 1

<sup>2</sup>o 2

<sup>3</sup>o 3

<sup>4</sup>o 4

<sup>5</sup>o 5

<sup>6</sup>o 6

7<sub>o</sub> 7  
 8<sub>o</sub> 8  
 9<sub>o</sub> 9  
 10<sub>o</sub>10      Best hospital possible

**22. Would you recommend this hospital to your friends and family?**

- <sup>1</sup> Definitely no   <sup>2</sup> Probably no   <sup>3</sup> Probably yes  
<sup>4</sup> Definitely yes

•            **UNDERSTANDING YOUR CARE WHEN YOU LEFT THE HOSPITAL**

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**23. During this hospital stay, the staff took my preferences and those of my family or caregiver into account in deciding what my health care needs would be when I left.**

- <sup>1</sup> Strongly disagree  
<sup>2</sup> Disagree  
<sup>3</sup> Agree  
<sup>4</sup> Strongly agree

**24. When I left the hospital, I had a good understanding of the things I was responsible for in managing my health.**

- <sup>1</sup> Strongly disagree  
<sup>2</sup> Disagree  
<sup>3</sup> Agree  
<sup>4</sup> Strongly agree

**25. When I left the hospital, I clearly understood the purpose of taking each of my medications.**

- <sup>1</sup> Strongly disagree  
<sup>2</sup> Disagree  
<sup>3</sup> Agree  
<sup>4</sup> Strongly agree  
<sup>5</sup> I was not given any medication when I left the hospital

**ABOUT YOU**

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There are only a few remaining items left.

**26. During this hospital stay, were you admitted to this hospital through the Emergency Room?**

<sup>1</sup>  Yes

<sup>2</sup>  No

**27. In general, how would you rate your overall health?**

<sup>1</sup>  Excellent <sup>2</sup>  Very good <sup>3</sup>  Good

<sup>4</sup>  Fair

<sup>5</sup>  Poor

**28. In general, how would you rate your overall mental or emotional health?**

<sup>1</sup>  Excellent <sup>2</sup>  Very good <sup>3</sup>  Good

<sup>4</sup>  Fair

<sup>5</sup>  Poor

**29. What is the highest grade or level of school that you have completed?**

<sup>1</sup>  8th grade or less

<sup>2</sup>  Some high school but did not graduate.

<sup>3</sup>  High school graduate or GED <sup>4</sup>  Some college or 2-year degree

<sup>5</sup>  4-year college graduate

<sup>6</sup>  More than a 4-year college degree

**30. Are you of Spanish, Hispanic, or Latino origin or descent?**

<sup>1</sup>  No, not Spanish/Hispanic/Latino

<sup>2</sup>  Yes, Puerto Rican

<sup>3</sup>  Yes, Mexican, Mexican American, Chicano

<sup>4</sup>  Yes, Cuban

<sup>5</sup>  Yes, other Spanish/Hispanic/Latino

**31. What is your race? Please choose one or more.**

<sup>1</sup>  White

<sup>2</sup>  Black or African American

- <sup>3</sup>  Asian  
<sup>4</sup>  Native Hawaiian or other Pacific Islander  
<sup>5</sup>  American Indian or Alaska Native

**32. What language do you mainly speak at home?**

- <sup>1</sup>  English <sup>2</sup>  Spanish <sup>3</sup>  Chinese <sup>4</sup>  Russian  
<sup>5</sup>  Vietnamese  
<sup>6</sup>  Portuguese  
<sup>9</sup>  Some other language (please print):

▪ **THANK YOU**

**Please return the completed survey in the postage-paid envelope.**

**[NAME OF SURVEY VENDOR OR SELF-ADMINISTERING HOSPITAL]**

**[RETURN ADDRESS OF SURVEY VENDOR OR SELF-ADMINISTERING HOSPITAL]**

*Questions 1-22 and 26-32 are part of the HCAHPS Survey and are works of the US Government. These HCAHPS questions are in the public domain and therefore are NOT subject to US copyright laws. The three Care Transitions Measure® questions (Questions 23-25) are copyright of Eric A. Coleman, MD, MPH, all rights reserved.*

*Sample Initial Cover Letter for the HCAHPS  
Survey*

[HOSPITAL LETTERHEAD]

[SAMPLED  
PATIENT NAME]  
[ADDRESS]  
[CITY, STATE ZIP]

Dear [SAMPLED PATIENT NAME]:

Our records show that you were recently a patient at [NAME OF HOSPITAL] and discharged on [DATE OF DISCHARGE (mm/dd/yyyy)]. Because you had a recent hospital stay, we are asking for your help. This survey is part of an ongoing national effort to understand how patients view their hospital experience. Hospital results will be publicly reported and made available on the Internet at [www.medicare.gov/hospitalcompare](http://www.medicare.gov/hospitalcompare). These results will help consumers make important choices about their hospital care and will help hospitals improve the care they provide.

Questions 1-25 in the enclosed survey are part of a national initiative sponsored by the United States Department of Health and Human Services to measure the quality of care in hospitals. Your participation is voluntary and will not affect your health benefits.

We hope that you will take the time to complete the survey. Your participation is greatly appreciated. After you have completed the survey, please return it in the pre-paid envelope. Your answers may be shared with the hospital for purposes of quality improvement. [*OPTIONAL*: You may notice a number on the survey. This number is used to let us know if you returned your survey, so we do not have to send you reminders.]

If you have any questions about the enclosed survey, please call the toll-free number 1-800-xxx-xxxx. Thank you for helping to improve health care for all consumers.

Sincerely,

[HOSPITAL  
ADMINISTRATO  
R] [HOSPITAL  
NAME]

*Note: The OMB Paperwork Reduction Act language must be included in the mailing. This language can be either on the front or back of the cover letter or questionnaire but cannot be a separate mailing. The exact OMB Paperwork Reduction Act language is included in this appendix. Please refer to the Mail Only and Mixed Mode sections for specific letter guidelines.*

## Sample Follow-up Cover Letter for the HCAHPS Survey

[HOSPITAL LETTERHEAD]

[SAMPLED  
PATIENT NAME]  
[ADDRESS]  
[CITY, STATE ZIP]

Dear [SAMPLED PATIENT NAME]:

Our records show that you were recently a patient at [NAME OF HOSPITAL] and discharged on [DATE OF DISCHARGE (mm/dd/yyyy)]. Approximately three weeks ago, we sent you a survey regarding your hospitalization. If you have already returned the survey to us, please accept our thanks, and disregard this letter. However, if you have not yet completed the survey, please take a few minutes, and complete it now.

Because you had a recent hospital stay, we are asking for your help. This survey is part of an ongoing national effort to understand how patients view their hospital experience. Hospital results will be publicly reported and made available on the Internet at [www.medicare.gov/hospitalcompare](http://www.medicare.gov/hospitalcompare). These results will help consumers make important choices about their hospital care and will help hospitals improve the care they provide.

Questions 1-25 in the enclosed survey are part of a national initiative sponsored by the United States Department of Health and Human Services to measure the quality of care in hospitals. Your participation is voluntary and will not affect your health benefits. Please take a few minutes and complete the enclosed survey. After you have completed the survey, please return it in the pre-paid envelope. Your answers may be shared with the hospital for purposes of quality improvement. [OPTIONAL: You may notice a number on the survey. This number is



used to let us know if you returned your survey, so we do not have to send you reminders.]

If you have any questions about the enclosed survey, please call the toll-free number 1-800-xxx-xxxx. Thank you again for helping to improve health care for all consumers.

Sincerely,

[HOSPITAL  
ADMINISTRATO  
R] [HOSPITAL  
NAME]

*Note: The OMB Paperwork Reduction Act language must be included in the mailing. This language can be either on the front or back of the cover letter or questionnaire but cannot be a separate mailing. The exact OMB Paperwork Reduction Act language is included in this appendix. Please refer to the Mail Only and Mixed Mode sections for specific letter guidelines.*