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Relationship Between Medicare Alternative Payment Methodology and Hospital Program Service Revenue

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This is to certify that the doctoral study by

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

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Abstract

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MBA, Rowan University, 2007

BS, Glassboro State College, 1984

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

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Abstract

Medicare paid $388.7 billion to acute care hospitals in 2014 representing the largest portion of the health care sector in the United States. Medicare implemented an innovative reimbursement model called Value Based Purchasing (VBP) to ensure hospitals provide quality care for the dollars spent. This correlation study used the VBP theoretical framework developed by Dudley as the foundation for the reimbursement model implemented by Medicare in 2013. The data used for this study came from the Centers of Medicare and Medicaid, as well as from Guidestar. The data focused on acute care, nonprofit hospitals located in New Jersey, New York, and Pennsylvania. Data trending and scatter plot graphs were used to analyze trends and basic correlation. Pearson correlation coefficient tests were performed to confirm correlation. The results showed no statistically significant relationship between program service revenue and the VBP domains for years 2013 and 2015. A weak positive relationship existed between 2014 program service revenue and the process of care domain; however, no statistically significant relationship existed between the remaining domains. The results from this study showed that quality metrics for acute care hospitals did not improve as the VBP criteria from Medicare expanded across the institutions included in the study. Hospital quality metrics are publicly accessible to everyone and allows patients to see actual results rather than the only resource being positive marketing campaigns. Accessibility to actual data has a positive influence on social change because patients can make informed choices for their personal health care needs.

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Dedication

This study is dedicated to my family who supported me throughout my journey. First to my husband, Sam, who went to many social gatherings without me while I stayed home to work and always supported and encouraged me to continue when I wanted to give up. Just as important are my two sons, John and Christopher, who had always believed in me even when I did not believe in myself. They are both my inspiration to go the extra mile so that I can be an example and role model for them. I have been blessed with the best family a person could have.

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To my committee chair, Dr. Scott Burrus, your guidance, and support helped me more than you could have known and been keys to my success. I would also like to acknowledge my committee, Dr. Kevin Davies, and Dr. Cheryl Lentz, for their support and efforts in helping me through this process. I would also like to thank my peers, too many to name, that was always encouraging and helpful though out the entire journey.

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Section 1: Foundation of the Study

Background of the Problem

Hospital care represents 32% or $311 billion of the U.S. health care spending, which reached $972 billion in 2014 (Bai & Anderson, 2016). Medicare moved towards a pay-for-performance model with a goal of 85% of the $373.3 billion spent on Medicare fee-for-service payments linked to quality (Maurer & Ryan, 2016). Medicare is the largest public health insurer in the United States (Chambers et al., 2015). Therefore, changes to the Medicare payment system for hospitals potentially could affect its program service revenue. Traditionally, the Centers for Medicare and Medicaid Services (CMS) pays hospitals for all services rendered to Medicare patients regardless of quality or outcome Medicare wants to change the payment methodology to ensure U.S. health care is high quality, cost efficient, and results in improved outcomes (Timimi, 2015). Hospital administrators need to understand the relationship of this new payment methodology with their program service revenue. The purpose of this quantitative correlational study was to establish a potential research reference for hospital administrators to examine the relationship between Medicare's payment methodology of value based purchasing (VBP) and hospital program service revenue.

Problem Statement

Acute care hospital administrators needed to change their business models from payment for quantity to payment for quality because of the changes in the Medicare's VBP reimbursement model (Meltzer & Chung, 2014). Hospital leaders needed to successfully shift their paradigm from *quantity* to *quality* to continue to receive their

facilities portion of the $388.7 billion paid by Medicare to acute care hospitals in 2014 (Brooks et al., 2014; CMS, 2015). The general business problem that I addressed in this study was that some hospital leaders do not know how VBP reimbursement correlates with their program service revenue (Bazile, Fareed, & Waters, 2014). The specific business problem was that some hospital business leaders do not have reference research that outlines whether the relationship exists between VBP reimbursement based on quality domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency and program service revenue.

Purpose Statement

The purpose of this quantitative correlational study was to provide hospital business leaders with a reference study showing the relationship if one existed between VBP reimbursement and program service revenue. This study included an examination of the relationship, if any, between the VBP reimbursement model of quality domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency compared to program service revenue. The independent variables were the domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency. The dependent variable was program service revenue. The targeted population included nonprofit hospital business leaders located in the tristate area of New Jersey, New York, and Pennsylvania. The implications for positive social change include the potential to provide some hospital business leaders a better understanding of the correlation if one exists between the VBP reimbursement model, which included domains of clinical process of care, patient experience of care, and outcomes on program service revenue.

Understanding the correlational relationship if one existed in the reimbursement model was foundational to decisions made to improve the financial performance and ongoing stability of the nonprofit and safety net hospitals in the region of this study.

Nature of the Study

The method of this study was quantitative because of the analytical ability to verify relationships between variables if one existed (Cokley & Awad, 2013). The quantitative method was positivist and analytical (Babones, 2015). Quantitative methods serve as a self correcting system of checks and balances assessing relations among variables (Cokley & Awad, 2013). The justification of the quantitative method stemmed from the need to test the relationship between (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency compared to program service revenue. The mathematical nature of quantitative analytics provided an objective result, avoiding ethical issues (West, 2015). The mathematical character of the quantitative method did provide statistical data to support whether a correlation existed in this study.

In contrast, qualitative research rarely employs statistical procedures and instead focused on observations to understand the nature of the problem (Baškarada, 2014). Qualitative studies in the purest form use open ended dialogue which does not provide the analytical result needed in this study (Jackson, 2015). The mixed method approach combines both a quantitative and qualitative forms of inquiry (Venkatesh, Brown, & Bala, 2013). The focus of this study was analytical, requiring specific data not found in open ended questions. Therefore, the qualitative method and mixed methods were not appropriate for this study.

The correlational design tested the model's VBP constructs and examined the strength of the relationship if one existed between the four independent variables and the one dependent variable (Cohen & Cohen, 2003). This study involved a statistical correlation research design between the independent variables and the dependent variable (Cokley & Awad, 2013). Researchers who wanted to manipulate the variables or determine cause and effect relationships use experimental and quasi experimental designs (Schwartz, Wilson, & Goff, 2015). However, this study is based a correlational relationship and not cause and effect or the manipulation of the independent variables. Therefore, the design was correlational because the experimental and quasi experimental designs did not meet the needs of this study.

Research Question

What is the relationship, if any, between VBP reimbursement based on quality domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency, and program service revenue?

Hypotheses

Null Hypothesis (H_0): No significant statistical relationship existed between VBP reimbursement based on quality domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency, and program service revenue.

Alternative Hypothesis (H_1): A significant statistical relationship existed between VBP reimbursement based on quality domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency, and program service revenue.

Theoretical Framework

The VBP model formed the basis of the theoretical framework for this study. Dudley (2005) developed the foundation of the VBP model in place. Damberg et al. (2014) of the Rand Corporation later extended the works of Dudley to develop the VBP model in place starting 2013. The current VBP model linked reimbursement for medical service to the quality of the services provided. The theoretical constructs provided by Dudley and Damberg shaped the program design to achieve improved value for patients and payers. Damberg identified the following key constructs underlying the VBP model: (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency.

As applied to this study, the expectation was that the VBP model's independent variables which are VBP constructs, measured by CMS's Hospital VBP calculations, would either reduce or increase the program service revenue. Romley, Goldman, and Sood (2015) demonstrated how costs increase in hospitals as focus moves from quantity to quality measures, providing support that VBP constructs related negatively to hospital profitability. The funding for the VBP program came from payment withholds from hospitals by Medicare, which immediately reduced patient service revenue at the start of the program supporting the correlation (Ryan, Burgess, Pesko, Borden, & Dimick, 2015). In addition, Gilman et al. (2015a) indicated 1,040 hospitals received payment reductions by CMS for not meeting the minimum score on quality domains, which demonstrated a potential relationship existed between VBP constructs and program service revenue. Figure 1 was a graphical depiction of the CMS VBP program in relationship with program service revenue.

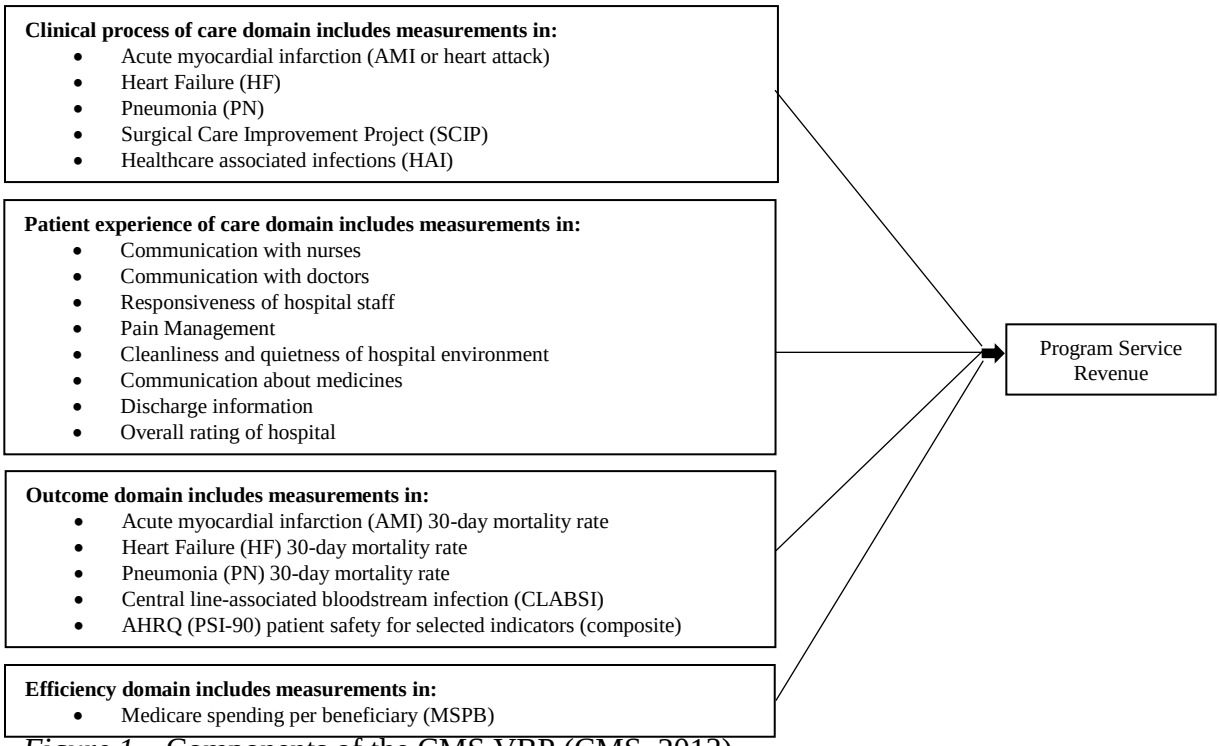

Figure 1 – Components of the CMS VBP (CMS, 2013).

Operational Definitions

Diagnosis related grouper (DRG): The diagnosis related grouper is a hospital payment system for the individual inpatient services (Mihailovic, Kocic, & Jakovljevic, 2016).

Domain: A domain is a group of quality metrics that CMS uses to evaluate hospitals in the VBP. There are four domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency (Brooks, 2016).

Fee for service reimbursement: Fee for service reimbursement occurs when health care providers are paid for each episode of care provided regardless of outcome (Chung et al., 2015).

Hospital compare: The hospital compare website provides the public with the results of the Centers for Medicare and Medicaid Services' rating system for hospital quality (Austin et al., 2015; Dor, Encinosa, & Carey, 2015).

Hospital consumer assessment of health care providers and suppliers (HCAHPS): The hospital consumer assessment of health provider and suppliers is a standardized survey conducted by CMS agents to measure patient experience yielding a rating system for hospital quality (Elliott et al., 2015).

Not for profit hospital: A not for profit hospital qualifies for exemption from federal income taxation under the Internal Revenue Code of 501(c)(3) (Dewees, 1997).

Program service revenue: Program service revenue comes directly from the primary activity of the nonprofit organization reported on Line 9, Part I of the IRS form 990 (U.S. Department of the Treasury, Internal Revenue Service, 2016).

Pay for performance: Pay for performance programs link provider compensation to cost and quality performance measures (Damberg, Elliott, & Ewing, 2015).

Value based purchasing (VBP): Value based purchasing is the CMS program to provide for incentive payments to hospitals based on measured outcomes in four quality measures of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency (Aroh, Colella, Douglas, & Eddings, 2015).

Vulnerable patients: Vulnerable patients are uninsured, low income, are racial or ethnic minorities and do not have easy access to health care. These patients are both citizens of the United States and undocumented individuals (Bacharach, Braslow, & Karl, 2012; Gilman et al., 2015b).

Assumptions, Limitations, and Delimitations

Assumptions

According to Tabachnick and Fidell (2012), an assumption is a fact accepted in faith without verification. The first assumption of this study was the data retrieved from www.medicare.gov/hospitalcompare provided valid and reliable metrics to measure all the variables under investigation (Beslin & Tasic, 2012). The second assumption was all hospitals reported their program service revenue in compliance with generally accepted accounting principles (GAAPs). The final assumption was all hospitals reported their program service revenue from operations in the tristate area and did not include operations located in another state.

Limitations

In research, deficiencies were inevitable within a study limiting the conclusions known as limitations (Tabachnick & Fidell, 2012). Limitations were the unavoidable shortcomings surrounding the study, which researchers restrict their findings (Tabachnick & Fidell, 2012). Readers of the research findings saw limitations as precautions in generalizing the findings (Leedy & Ormrod, 2012). There are three identifiable constraints in my study. First, the results of this study might not be generalized to any hospital because nonprofit status and the location also affected the program service revenue. Second, the linkage of program service revenue to the Medicare VBP model did not consider other drivers of profitability. Third, the use of numeric data alone to measure program service revenue hid the role of non quantifiable measures (Delen, Kuzey, &

Uyar, 2013). The limitations outlined restrained generalization of this study support the documentation for reference for future readers of this study.

Delimitations

Delimitations provided boundaries to the interpretation of the results of this study (Tabachnick & Fidell, 2012). Delimitations were self imposed limitations (Delen et al., 2013). To obtain an accurate correlation, a researcher must avoid an overstated or understated correlation providing misleading results (Tabachnick & Fidell, 2012). Three delimitations existed in this study. The first delimitation was a correlation, rather than causation, between the VBP reimbursement incentives and program service revenue. The purpose of this study was to identify if a correlation existed between the independent and dependent variable, not whether one variable caused changes in another variable. Second, the sample was limited to nonprofit hospitals located in the tristate area of New Jersey, New York, and Pennsylvania with all the necessary data to measure the variables of interest. The final delimitation was the VBP model used data reported by hospitals with an approximate 2 year delay, creating a gap between results and current operations.

Significance of the Study

The ongoing shift of CMS from quantity to value centric reimbursement amplified the need for hospitals to understand their organizational structures and capabilities to sustain or improve their program service revenue (Douglas, Aroh, Colella, & Quadri, 2016). The contributions of this study might be of interest to nonprofit hospital leaders transforming their organization's operations to meet the needs of the alternative payment model of VBP because it is considered as the long term solution for CMS to pay

for quality health care from hospitals (Ryan et al., 2015). The following paragraphs showed how the study results might help to improve hospital business practices and to promote positive social changes.

Contribution to Business Practice

This study may be significant because hospital administrators are working to balance quality metrics with financial performance. Halfon et al. (2014) described the U.S. health system as transforming the emphasis of health care to population and community health outcomes to optimize the health of populations across generations. First, the results of this study may be valuable to any health care organization aimed to renovate its focus on the quality of health care and health outcomes. Quality and the results are imperative, because reimbursement changes to alternative methods tie finance with quality health care and patient outcomes (Timimi, 2015). Second, the results may help hospital administrators identify which VBP constructs generated the largest variations in program service revenue. The findings may provide a starting point to focus their limited resources. Third, the study may help hospital administrators apply the study methodology to their specific hospital results to provide crucial understanding of their specific correlation between the quality measures and their program service revenue. This exercise was important to each hospital to learn how its constructs may correlate to program service revenue for strategic planning in the new payment methodology environment.

Implications for Social Change

Hospital administrators, patients, and financial rating agencies may benefit from the findings of this study. The prediction of health spending for hospital care was expected to rise from $936.9 billion in 2013 to $1,755.1 billion in 2024, with changes in focus from quantity of care to quality of care (Keehan et al., 2015). VBP was an external motivator to drive hospitals to improve performance, clinically, and financially (Douglas et al., 2016). The findings may inform hospital administrators, patients, and financial rating agencies the importance of quality deliverables and outcomes in health care. The findings could drive a behavioral change in the decision making processes and practices within hospital finance administrators and leaders. Financial leaders who can see the improvement of the quality of care as a financially sound direction may improve patient care, and the health of the community served.

Hospitals have improved quality performance in anticipation of the implementation of the VBP model (Ryan et al., 2015). However, the quality of care must continually improve across the industry to benefit the patients served. As hospitals become more quality driven and profitable, the likelihood will rise of investing in social infrastructure, education, and health care leading to positive social changes (Conrad, Vaughn, Grembowski, & Marcus Smith, 2015). Conrad et al. (2015) indicated VBP could increase value in health care coverage for the community and financial performance providing improved financial ratings for hospitals to obtain affordable financing to continue the journey of improved health outcomes.

A Review of the Professional and Academic Literature

A thorough review of the literature requires a researcher to focus diligently and optimize the available resources and academic literature to provide readers confidence in the study findings (Turner, Balmer, & Coverdale, 2013). In this literature assessment, this study followed the methodology outlined by Turner et al. (2013) to assure the credibility of the study. In agreement with Allwood (2012), research requires a thorough and comprehensive review of the literature to ensure the relevance of a study. This research included an in depth research of publications to support the relevance of the research questions about a business problem starting in 2013.

The purpose of this quantitative correlation study was to examine the relationship between VBP reimbursement based on quality domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency, compared to program service revenue. The null hypothesis of this study stated no statistically significant relationship existed between VBP reimbursement domains and program service revenue. The VBP model of pay for performance was the basis of the theoretical framework of this study.

During this review, the main topics of the studies are Medicare payment models, VBP, program service revenue and health care payment reform. The review included sources based in the United States because of the uniqueness of Medicare compared with international medical coverage. A comprehensive literture seearch using multiple online research databases was utilized. The primary sources of the literature review were peer reviewed journal articles, government-issued reports, and government websites. Search topics included but were not limited to *VBP, alternative payment methods, fee for service,*

*HCAHPS, health care quality, health care spending, hospital care, hospital reimbursement, hospital costs, not for profit hospitals, patient experience, pay for performance, performance metrics, program service revenue, quality measures,*and *vulnerable patients*. The primary electronic database was subscription based Health Affairs, which included peer reviewed articles representing the intersection of health, health care, and policy. Additional databases utilized included the following: ABI / INFO Complete, Academic Search Complete, Business Source Complete, Dissertations and Thesis, Emerald Management Journal, Sage Premier and Science Direct. In addition, Google Scholar search engine was used to help locate specific sources. In the review, 156 sources were included, of which 139 are peer reviewed journal articles and 17 are non peer reviewed sources, such as journal articles, seminal books, reports and government websites. Table 1 shows 90% of the references are less than 5 years old, and 89% of the references are peer reviewed journals.

Table 1

Source Identification and Distribution Table

Total	< 5 years	> 5 years	Peer reviewed	Non peer Reviewed
156	141 = 90%	15 = 10%	139 = 89%	17 = 11%

The purpose of this study was to provide hospital business leaders with a reference study showing whether a correlation is possible between VBP reimbursement and program service revenue. The null hypothesis indicated no significant statistical relationship between VBP reimbursement based on quality domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency, compared

to program service revenue. The literature provided various viewpoints supporting and disproving the null hypothesis.

The organization of the literature review is in five sections. The first section includes the summary of the demonstration project, which establishes, confirms and improves the theoretical framework for VBP. The next section consists of outlining the prior studies on health care reform with a focus and comparison to VBP. The difficulty vulnerable patients create for nonprofit hospitals to achieve high scores in their VBP metrics is the concentration of the third section. The fourth section highlights health care payment reform models compared to VBP. The final section is a comprehensive review of the VBP program, the measurement methodology of the constructs and the innovative information available with the implementation of the program in 2013.

Demonstration Project by CMS

The demonstration program performed by CMS in 2003 established the pay for performance reimbursement model in health care (Ryan et al., 2015). The project known as the Hospital Quality Incentive Demonstration provided the foundation for the VBP program of this study (Werner, Kolstad, Stuart, & Polsky, 2011). CMS wanted to prove a pay for the performance model is applicable and achievable in the target population of nonprofit hospitals (Kahn, Ault, Isenstein, Potetz, & Van Gelder, 2006). Pay for performance is new to the nonprofit hospital industry and bridges the gaps in health care coverage to vulnerable individuals in the United States. The groundbreaking project lasted 7 years and ended in 2009, 4 years before the implementation of VBP (Ryan et al., 2015). The theoretical framework of the CMS demonstration project followed the pay for

performance concepts developed by Dudley (2005) and later expanded by the Rand Corporation (Damberg et al., 2014). This project laid the foundation for VBP implemented in 2013.

The CMS demonstration project had one construct of the clinical process of care in comparison with the current program of four constructs (Ryan, Blustein, & Casalino, 2012). The CMS demonstration project construct focused on acute myocardial infarction, also known as heart attack, heart failure, and pneumonia and did not include surgical care improvement or health care associated infections as in the current VBP model (Ryan et al., 2012). The concept andin 2003. This model contradicted the nonprofit hospital financial strategy to increase volume regardless of quality to increase revenue (Romley et al., 2015). Hospital financial leaders create budgets yearly to estimate revenues and the basis of those budgets are volume driven. Department leaders project whether their volume will increase, remain the same, or decrease providing support for the forecast. The calculation uses the projected volume multiplied by the average historical reimbursement to yield projected revenue (Kleweno, O'Toole, Ballreich, & Pollak, 2015). The concept is elementary showing increases in volume equals increases in revenue and decreases in volume yields the opposite result.

The idea of linking quality of care to financial performance debuted with the inception of the demonstration project in 2003 and gave hospitals a first look at the foundation of a new reimbursement model. Participation in the demonstration project was voluntary contrary to the mandatory involvement in the VBP program implemented in 2013 (Werner & Dudley, 2012). The CMS demostration project solicited 414 hospitals to

participate, and only 267 financially stable hospitals chose to participate (Werner et al., 2011). Only stable financial hospitals participated because of the anticipation of added costs to improve quality, creating a barrier to hospitals not having the fiscal means to add costs and lower their program service revenue.

The design of the CMS demonstration project was to investigate methods to measure quality and reward hospitals providing top quality care to their patients (Ryan et al., 2012). The demonstration project forced hospital financial leaders to collaborate with the clinical teams with a common goal of improved quality of care to gain financial improvement. From 2003 through 2006, CMS paid incentives of approximately $33,000 to each hospital achieving high levels of quality in several clinical areas per year (Blustein, Weissman, Ryan, Doran, & Hasnain-Wynia, 2011). In 2006, the program evolved closer to the VBP program by requiring good performance and quality improvement across a larger spectrum of quality measures (Ryan et al., 2012). The birth of pay for performance in nonprofit hospitals arose out of this innovative project.

The demonstration program resulted in statistically significant improvements in the participating hospital's performance supporting the implementation of the mandatory VBP program in 2013 (Werner & Dudley, 2012). Werner and Dudley (2012) also reported that CMS spent $48 million in bonus payments for the demonstration project. However, as noted earlier, only financially stable organizations chose to participate and were successful. The current program that started in 2013 was not voluntary, and all organizations must participate regardless of their financial stability which is projected to negatively affect many hospitals (Zhao, Haley, Spaulding, & Balogh, 2015).

Prior Studies on Health Care Payment Reform

Medicare moved towards a pay for performance model with a goal of 85% of the $373.3 billion spent on Medicare fee for service payments linked to quality by the end of 2017 (Maurer & Ryan, 2016). Medicare chose VBP as the preferred and implemented the method as of 2013 (Zhao et al., 2015). The pay for performance payment reform was innovative and new to the hospital industry executives needed to gain knowledge on the effect this program did have on their organization's finances. Several studies focused on current payment methodology, improving non hospital health care, better access to care, partnerships with the community and other CMS programs in relationship to pay for performance (Bonfrer et al., 2014; Broom, Counte, & Turner, 2015; Carrillo, Carrillo, Guimento, Leiman, & Mucaria, 2014; Greene, Hibbard, & Overton, 2015). A review of these studies provided insight as to whether this correlation study of VBP and patient service revenue was relevant to industry leaders.

The first study that was reviewed was an exploratory study regarding the DRG rate related to improved patient satisfaction, health outcomes and adherence to clinical protocols resulting in little to no correlation with the Medicare payment rate (J. S. Turner et al., 2015). The weakness of this study was the DRG rate has no relationship with performance measures; the DRG payment system was cost based rates multiplied by a relative weight factor per DRG (Melberg, Beck Olsen, & Pedersen, 2016; Mihailovic et al., 2016). CMS calculated the rate by using the cost of diagnostics and treatments from prior services provided (Mihailovic et al., 2016). This reimbursement model did not

correlate with patient satisfaction, health outcome, or adherence to clinical protocols resulting in an expected null hypothesis finding.

The second case study happened at a major NY hospital focused on improved quality of inpatient care by using patient centered medical homes for chronically ill patients (Carrillo, Carrillo, Guimento, Leiman, & Mucaria, 2014). The study resulted in positive financial outcomes by reduced costs with reduced usage of the emergency room (Carrillo et al., 2014). This study was one of the closest studies to finding a correlation between improved performance factors and finances showing that a relationship between finance and quality measures was possible. The financial improvement from this study focused on reducing the number of patients utilizing the expensive emergency room. However, the reimbursement methodology in place rewarded reduced volume, not value (Kellermann, Hsia, Yeh, & Morganti, 2013). The reduction of billable visits in the emergency room also reduced hospital revenues in an area of high fixed costs spread (Dong, 2016). Therefore, this study shows methods existed to improve patient outcomes, but the hospital payment methodology in place at the time of the study created a barrier for those facilities not able to financially afford to lower volume.

Another study focused on pay for performance in correlation to increased usage of facilities yielded an overall quality improvement of 17 percentage points (Bonfrer et al., 2014). However, Bonfrer et al. (2014) concluded that the pay for performance model did not contribute to the improved quality of care, but did increase access to care. The improved access resulted in improved quality outcomes for more individuals. Although access to care is not a construct in the VBP model, the ability to improve the four

constructs of VBP did require patients to have access to services to improve outcomes (Osborn, Moulds, Squires, Doty, & Anderson, 2014). Although this study did not focus on a correlation between quality and finance, the study proved an important point regarding patients need for access to care to improve their health outcomes. Additional research indicated that innovation in access to health care is the new health care reformed environment (Kvedar, Coye, & Everett, 2014). The studies reviewed in this section supported the need not just to focus on specific metrics in the pay for performance model but ensured patients have the appropriate access to receive care to improve the constructs of VBP.

The next study focused on provider performance by creating a measurable baseline for clinician performance and published the individual results with each member of the study (Greene et al., 2015). Transparency of the results showed the clinicians in the bottom third improved an average of three times more than the middle third and almost six times more than those in the top third (Greene et al., 2015). These metrics were human capital metrics that have the largest influence on improved performance supporting the VBP model (Emami & Doolen, 2015). Managing and publishing human capital metrics can improve patient outcomes and lower costs (Melnyk et al., 2016). The transparency was an important aspect of the VBP program and research showed that published comparative metrics improve performance (Greene et al., 2015). Clarity of the metrics results is important to the consumer when choosing the facility for medical services. Hospitals need transparency for comparison with their competitors. Last, CMS need transparency to pay for high quality.

As the implementation of VBP moved into the landscape, innovation on how to improve outcomes was forging new partnerships in health care. Sandberg et al. (2014) study focused on an organization who developed community level partnerships to improve outcomes. The organization realized accountability for patients included behavioral, social, and economic areas regardless of the ability of the organization's adeptness to provide services (Sandberg et al., 2014). To ensure improved patient outcomes, the care for the patient went beyond the time in the hospital. Hospital care focused on acute responsive care, not an ongoing long term improvement. Improved outcomes required hospitals to create partnerships outside their facility to provide care for their patients to ensure their overall health improved long term. The focus on long term improvement was a huge change in vision for hospital leadership, who in the past focused only on the care patients received in the hospital facility. The VBP constructs required hospitals to ensure patients continued to improve beyond their hospital stay since the outcome domain measured 30 days beyond discharge from the hospital (Haley, Zhao, & Spaulding, 2016). Sandberg et al. (2014) study proved that partnerships with health care providers and hospitals needed to pursue to be successful in VBP.

Before plans to implement VBP, CMS implemented the patient safety program in 2003 with 20 patient safety indicators measuring adverse events (Rajaram, Barnard, & Bilimoria, 2015). The patient safety program focused on penalizing for poor performance and resulted in low performing hospitals penalized while their quality did not improve. This early program provided insight into hospitals willingness to comply to avoid penalties but not improve any further than required. The patient safety program created a

reactionary performance by hospitals meeting standards with no incentive to improve beyond the traditional standard to avoid penalty. Rajaram, Barnard, and Bilimoria (2015) showed to promote improvement, a required focus on the metrics with high performing goals was necessary, and by penalizing for not meeting the metric, the result promoted facilities to meet the metric, not exceed the metric. A balance of basic expectations and expected improved results must exist for any program to promote meeting high performing metrics.

CMS tried another pay for performance program in Part D prescription drug benefits provided to beneficiaries (Young, Rickles, Chou, & Raver, 2014). A key measure was enrollee's medication adherence driving improvement in patient outcomes (Young et al., 2014). This study showed CMS continues to focus on the patient outcome beyond the action taken by the provider paid by CMS. Pharmacy programs concentrated on ensuring patients receive the correct medication. However, this program shifted focus beyond just dispensing medication (Svensberg, Björnsdottir, & Kälvemark Sporrong, 2015). Pharmacies responded by providing private areas for pharmacists to provide patient education individually as needed (Chow, Hassali, Saleem, & Aljadhey, 2016). Pharmacies also started refill notification programs calling patients when the patient's medication is about to run out (Rickles et al., 2016). Rickels et al. (2016) reported this program improved patient adherence to their medications as well as revenue by ensuring patients came back to the same pharmacy to continue to fill prescriptions. This CMS Part D program instilled the type of behavior CMS expected in the hospital industry with the VBP program. Another response to adherence is pharmacies contacted the provider for

the patient to get a new prescription when refills ran out, or the prescription expired (O'Quin, Semalulu, & Orom, 2015). O'Quin, Semalulu, and Oram (2015) indicated pharmacies knew many patients did stop taking medication for various reasons and consequently the pharmacy industry responded with more focus on ensuring patients complied with their medications than patients did historically. CMS used this medicaiton adhereance program as a foundation for creating the VBP outcome domain construct focused on outcomes which required facilities to continue to ensure patients health improved beyond their visit to the hospital.

Based on the review of the various studies presented, the hypothesis of this study was relevant and an important focus for the hospital industry. Bai and Anderson (2016) stated that policymakers needed to monitor the effect of alternative payment models on hospital profit margins. Program service revenue was the first element in calculating profit margin and financial performance (Dong, 2016). As Medicare is the largest public health insurer in the United States, the changes in their payment methodology have the potential to correlate to changes in financial performance in hospitals (Chambers et al., 2015). The potential correlation supported the business leaders interest in my research study.

Vulnerable Patients

After reviewing the various studies, no study focused on the contribution of vulnerable patients have on nonprofit hospitals. Most vulnerable patients have few options for health care, and many chose nonprofit hospital's emergency rooms for all their health care needs (Neuhausen et al., 2014). Nonprofit hospitals face difficult

challenges to improve quality to the extensive spectrum of the patient population served because of their nonprofit status (Damberg, Elliott, & Ewing, 2015). The vulnerable patients consisted of four million Americans and countless undocumented immigrants who remain uninsured patients after the 2010 ACA health care reform implementation (Reiter, Noles, & Pink, 2015). The ACA focused on reducing the uninsured as much as possible. However, the final legislation made some reforms optional leaving a gap.

The largest improvement for the vulnerable patients was the expansion of Medicaid programs to include more individuals. However, Medicaid expansion became optional to state governments in the final regulation (Sommers, Maylone, Nguyen, Blendon, & Epstein, 2015). As of April 2016, 26 states expanded coverage to all citizens and legal immigrants whose income is below 138% of the federal poverty level which is $16,242 for a single individual, six states established alternative criteria, and 19 states did not expand (Cardwell & Sheedy, 2016). The expansion of the Medicaid coverage had a positive affect on patients. More individuals and families qualified for free health care and had access to more providers. However, hospital reimbursement represented less than the cost of care by Medicaid (Neuhausen et al., 2014). The lower than cost reimbursement improved from the free care previously provided (Blavin, 2016). However, more patients had access to care, increasing the number of patients accessing services under this payment methodology. This lack of reimbursement to cover costs added additional strain on hospitals to meet the VBP constructs with limited resources. Hospitals already faced reimbursement challenges within the current system, the additional strain of meeting VBP could lower program service revenue.

There were no statistics on the number of vulnerable patients who were undocumented immigrants accessing the U.S. nonprofit system of hospitals. The undocumented immigrants must either pay cash to access health care or use the nonprofit hospital system through the emergency room entrance (Fernández & Rodriguez, 2017). Nonprofit hospitals must see every patient who presents to their facility through the emergency room. Hospitals treating these vulnerable patients did receive additional funding through the disproportionate share hospital (DSH) funding program. However, the funding for the DSH program was earmarked to decrease (Neuhausen, 2013). The ACA mandated funding reductions of $35.1 billion between 2017 and 2024 (Cole, Walker, Mora, & Diana, 2014; Navathe et al., 2013). The decreased funding for vulnerable patients puts more pressure on the strained finances of nonprofit hospitals to continue to improve care and patient outcomes required in VBP.

Another barrier faced by full service nonprofit hospitals was the care model provided to vulnerable patients. The care provided in the emergency room was episodic and reactive which led to an unstructured care process (Salmond & Echevarria, 2017). This process required expert physicians to determine a different course of care to meet each patient's needs (Cook et al., 2014). This type of unstructured care provided challenges for hospitals to meet the mark in the metric driving the high quality care reimbursement model of VBP (Coughlin, Long, Sheen, & Tolbert, 2012). Health care reform did not consider the factors of treating vulnerable patients in an unstructured care environment; the expectation was to provide high quality care regardless of the patient's health status or arrival mode to the facility (Kellermann et al., 2013). The VBP program

had no exceptions regarding the care and cost requirements forcing nonprofit hospitals to develop innovation to meet the needs of vulnerable patients in the high cost environment of the emergency room.

This unstructured care process contradicted the care model of patient centered care as a business imperative to meet the performance measures expected by CMS (Chandra, Dalton, & Holmes, 2013; Cosgrove et al., 2013; Maeng et al., 2015). Many hospitals pursued consistency with employed physicians called hospitalists to combat this unpredictability (Sparks et al., 2015). The concept was the employed physician provide high quality care in all care settings in a familiar environment so the hospital can still improve care quality (Sparks et al., 2015). In essence, the hospital provided a consistent provider to treat more vulnerable patients in an unstructured unpredictable environment to meet the metrics for VBP.

The early results of the pay for performance payment model showed hospitals serving vulnerable patients receive disproportionate penalties in VBP (Maurer & Ryan, 2016). Maurer and Ryan (2016) also indicated that the ongoing effect of financial incentive programs such as VBP could decrease program service revenue for hospitals caring for vulnerable patients. Those early results did not change the mandate by CMS to implement a pay for performance program (Werner & Dudley, 2012). The VBP program did affect about 3,400 U.S. hospitals regardless of the populations they serve (Kahn et al., 2015). In summary, nonprofit hospitals continued to face challenges of serving vulnerable patients within the competing priorities of health care reform and their only option was to be innovative to provide high quality care to every patient.

Health Care Payment Reform

U.S. health care spending was on the rise with an increase from $2.4 trillion in 2008 to $3.0 trillion in 2014 representing 17.5% of GDP (Martin, Hartman, Benson, Catlin, & the National Health Expenditure Accounts Team, 2015). Hospital care was the largest component of health care spending accounting for 32% or $971.8 billion in 2014 (Martin et al., 2015). Hospitals performed various services, and the inpatient hospital services are the highest expenditure for CMS and patients. The current hospital reimbursement system for inpatient hospital cases was DRG reimbursement which began in the 1980s (Hof, Fugener, Schoenfelder, & Brunner, 2015). CMS implemented this model to create cost containment by only paying a predetermined price based on the cost of providing services, adjusted by weighted factors for each inpatient stay based on the patient's diagnoses (Hof et al., 2015). Hospitals responded with cost efficiencies in their operations since reimbursement was predetermined based on the patient's diagnoses. The focus in the industry was to reduce the length of stay and variable expense. Hospitals have significant overhead and fixed expenses which are the same regardless of volume (Dalton & Warren, 2016). However, variable expenses fluctuate based on the census and the largest being nursing care (Hode et al., 2017). If hospitals could reduce the census by keeping patients in the hospital for a shorter length of time, variable costs would decrease, and improved their program service revenue.

Many hospitals used consultants and project teams to implement programs to ensure patients did not stay longer in the hospital than necessary (Challis, Hughes, Xie, & Jolley, 2014). However, these initiatives by individual hospitals discharged patients into a

larger fragmented system which lacked clinical coordination between providers of care (Robinson, 2013). The system did not contain costs, on the contrary, health care spending doubled from 1980 to 2011 (Ginsburg, 2013; Martin, Hartman, Whittle, Catlin, & the National Health Expenditure Accounts Team, 2014). The failure of this system containing costs had a huge weakness of not including any focus on the patient; the only focus was on the payment to the hospital (Turner, Broom, & Counte, 2015). This focused on the reimbursement system to encourage hospitals to fast track their discharge processes and not keep patients in the hospital too long. The system encouraged hospitals to stabilize and discharge the patient with no focus on long term recovery. Patients could return to the hospital repeatedly for the same illness, and the hospital received full reimbursement for each patient visit. Hospitals had no ownership of the patient's access to ongoing care towards full recovery, leaving many patients stranded in the fragmented provider networks (Tsilimingras et al., 2015). VBP metrics on post discharge health care forced hospitals to make this an important aspect of the care provided while the patient is in the facility.

This failure of cost containment led CMS to find innovative provider payment methods to improve care and slow spending (Biles, Casillas, & Guterman, 2015). The ACA enacted in 2010 began the redesign of the health care payment methodology of fee for service (Raso, 2015). The legislators amplified the pressure on health care spending pushing the focus toward a metrically driven reimbursement model (Timimi, 2015). Hospitals were the focus for the lack of cost containment and redesigned with the largest reform focused on their reimbursement methodology.

The ACA reformed health care spending with three programs, the Hospital Readmissions Reduction Program (HRRP), the Hospital Acquired Condition (HAC) Reduction program, and the VBP program (Rajaram et al., 2015; Schmocker et al., 2015). The HRRP program began in 2012 and penalized hospitals for excessive readmissions within thirty days of hospital discharge (Sheingold, Zuckerman, & Shartzer, 2016). The support for the HRRP program stemmed from the statistic of one out of every eight Medicare patients returned to the hospital within 30 days of discharge after surgery in 2010 (Haley, Zhao, & Spaulding, 2016; Zhao et al., 2015). This statistic indicated hospitals may have not discharged patients to the proper post acute setting to ensure a full recovery without readmission to the hospital. As a consequence of the hospital program, leadership needed to focus on the care patients has access to beyond their hospital visit. The HRRP program penalized hospitals for patients reentering their hospital or any other hospital within 30 days of discharge, fueling innovation on creating communication in the largely fragmented system. The HRRP program drove hospital leadership to forge relationships with postacute care providers such as primary care, home care and pharmacy compliance programs to ensure their patients did not return to the hospital.

Once CMS saw improvement in care with the implementation of the HRRP program, the next focus was to reduce HACs which created increased health care costs by paying for patient care to recover from a preventable illness while hospitalized. The HAC reduction program started in the fiscal year 2015 resulting in conflicting results with hospitals performing high in the VBP quality measures penalized more frequently (Barnard et al., 2015). These initial findings suggested the HAC program needed to be

reevaluated to ensure this program did achieve the intended goals (Barnard et al., 2015). The HAC program had a specific listing of conditions patients should not acquire during their hospital visit. Hospitals were required to indicate on every diagnosis coded for a hospital inpatient stay whether the diagnosis was present on admission (POA), hospital acquired condition (HAC), or exempt (Redondo-Gonzalez, Tenas, Arias, & Lucendo, 2017). To ensure compliance, CMS monitored trends to ensure all hospitals report these indicators within the norm of their peers. Hospital administrators knew noncompliance could lead to disciplinary action and the possibility of the loss of participating in the Medicare program, therefore, compliance was the norm.

Payment reform was not only a focus of CMS; consumers drive reform since patients are sharing higher costs with the high deductible health insurance coverage (Robinson & Brown, 2013). Many patients had options to use their local hospital or travel to another city to access care. Therefore, their participation in payment reform was as important as CMS. In response to patients having choices, hospitals reduced their rates with private payers to attract more of the privately insured, creating another reduction in program service revenue (White, 2013). The generators of payment reform came from CMS and patients, and the target of the changes focused on hospitals. Hospitals received almost one third of all U.S. health care spending in 2014 (Bai, 2015; Iglehart, 2014). Hospitals faced stronger financial pressure than any other health care sector to improve quality to support the high level of spending on hospital related services (Tsai et al., 2015). Hospitals needed to understand the pressures of payment reform from all directions to be successful and maintain or improve program service revenue.

Value-Based Purchasing

The third program mandated by the ACA is hospital VBP. CMS summarized the program as rewarding hospitals based on (a) the quality of care provided; (b) compliance with best clinical practices; and (c) how well hospitals enhance patients' experiences of care during hospital stays (CMS, 2015). In the fiscal year 2013 (October 1, 2012, to September 30, 2013), CMS began to link approximately 3,000 acute care hospital's Medicare reimbursement to performance (Das et al., 2016; Haley et al., 2016). The VBP program forced hospitals to manage their focus on population health in addition to managing their operations (Mark et al., 2016). CMS stated in their report on VBP that reimbursement to hospitals is not going to be on the number of services provided (CMS, 2015). CMS wanted to replace quantity with quality (Romley, Goldman, & Sood, 2015).

The VBP program was technically a redistribution payment program from CMS (Bai & Anderson, 2016; Bosko, Dubow, & Koenig, 2016). CMS withheld a percentage of the inpatient payments to hospitals and then redistributed this money back to hospitals based on performance (Brooks, 2016; Figueroa, Tsugawa, Zheng, Orav, & Jha, 2016). The withhold percentage started at 1.0% in the fiscal year 2013 and increased up to and held at 2.0% in the fiscal year 2017 (Haley et al., 2016; Gilman et al., 2015a). The program design was to reward high performing hospitals based on their metrics while penalizing those who do not meet the expected metrics (Gilman et al., 2015b). In the fiscal year 2015, 1,360 hospitals had penalties, and 1,700 hospitals received bonus payments (Figueroa et al., 2016). These results show that VBP had potential to change

program service revenue supporting the need to study the correlation between these two factors.

The basis of the bonus or penalty was the higher of two metrics for improvement or performance (Brooks, 2016). The first was how well the hospital performs on each measure and the second was how much the hospital improved their performance on each measure compared to their performance during a baseline period (CMS, 2013). This method allowed CMS to compare performance against a hospital's performance as well as compared to their peers (Brooks, 2016). The performance year was the most recent calendar year completed before the start of the CMS fiscal year starting October 1st (Brooks, 2016). An example was the basis of the rewards or penalties for FY 2018 starting October 1, 2017, was the calendar year performance of 2016 (Brooks, 2016). The baseline period was different based on domain, with all being from two to four years before the performance year (CMS, 2015). The complexity of the base year in relationship to the rewards or penalty year added another layer of confusion to the understanding of correlation, if one existed, between VBP constructs and program service revenue supporting the need for this study.

VBP was a quantitative program using metrics and surveys to calculate the constructs of (a) clinical process of care, (b) patient experience of care (c) outcome, and (d) efficiency (Pincus, Scholle, Spaeth-Rublee, Hepner, & Brown, 2016; White, Reschovsky, & Bond, 2014). The goal of this quantitative model of evaluation was to bridge the gap between science and practice (Karazsia & Berlin, 2014). Each domain of the VBP model defined quantitative collection techniques to ensure the quality and

integrity of the data (Simpson & Lord, 2015). Using this quantitative format avoided bias in the results bridging the gap between reality and perception (Scopelliti et al., 2015). The quantitative method used in VBP supported this study method by using the quantitative VBP results and comparing them with program service revenue to prove or disprove correlation.

In CMS's fiscal year 2013, the program began with two quality domains of clinical process of care and patient experience of care including 21 quality measures (Brooks, 2016). The clinical process of care domain included metrics that (a) measure therapies provided to patients within the first 30 and 90 minutes of hospital arrival, (b) discharge instructions, (c) antibiotic protocols, and (d) postoperative outcomes (CMS, 2013). This domain was one of the first domains of metrics implemented in the program (Zhao et al., 2015). CMS calculates the metrics for the clinical process of care using data submissions from hospitals subject to audit by CMS at any time. CMS indicated that falsifying data would result in expulsion from the Medicare program which no hospital wants to happen. Therefore, reported results are reliable.

The patient experience of care domain included metrics regarding (a) hospital staff communications and responsiveness, (b) pain management, (c) medicine communication, (d) cleanliness and quietness of the facility, and (e) overall hospital rating (CMS, 2013). Patient experience was the most difficult construct to measure. The data collected was shaped by the patients' care experience with health service delivery and their sociodemographic characteristics (Greene, Hibbard, Sacks, & Overton, 2013; Papanicolas, Cylus, & Smith, 2013). The data came from actual patients through the

HCAHPS survey model implemented by CMS (Howie, Hirsch, Locklear, & Abernethy, 2014). The surveyors translated the data into quantitative results, summarized consistently, and reported in the hospitalcompare website, so hospitals tracked their progress (Pierson, Hand, & Thompson, 2014). CMS implemented the HCAHPS survey process to help minimize the variation in the data by using consistent data collection methods.

In CMS's fiscal year 2014, the outcome domain became the third group of metrics required in VBP. This domain was also considered a quality domain similar to the clinical processes of care domain (CMS, 2013). The outcome domain included metrics that (a) track mortality rates in three areas for 30 days post discharge from the hospital, (b) measure patient complications and safety, and (c) track bloodstream infections (CMS, 2013). CMS leveraged data from the Department of Health and Human Services National Quality Measures to round out the outcome domain for patient safety (Meltzer & Chung, 2014). The purpose of this domain metrics was to emphasize the improved clinical outcomes (Brooks, 2016). This domain forced hospitals to ensure patients have the proper follow up and support care post discharge from their hospital care.

The final domain of efficiency started in CMS fiscal year 2015. This domain had one measure of Medicare spending per beneficiary episode (CMS, 2013). This domain was a calculation of Medicare costs which were price standardized and risk adjusted for all hospitalized patients for an individual episode of care starting 3 days before hospitalization and ending 30 days after discharge (Das et al., 2016). This final domain changed the program by giving this domain a 20% weight reducing the total quality

domains of clinical process of care, patient experience of care and outcomes to 80% with each domain weight being 20%, 30%, and 30% respectively (Das et al., 2016). The addition of the efficiency domain also expanded the scope of hospital management to ensure discharged patients go to the right place for the right care at the right price and the right time.

The heightened attention to spending presented challenges such as treating the sickest elderly out of all the industrialized countries based on a 2014 survey (Osborn et al., 2014). Another challenge was to overcome preventable medical errors and full implementation of evidence based medicine (Millenson, 2013). An estimate from 1999 reported 100,000 people died in U.S. hospitals from preventable medical errors (Moran & Scanlon, 2013). One way to overcome these challenges was innovation. Innovative technology was known as telemedicine and teleemergency, which provided accessibility to expert knowledge via televideo quickly and cost effectively, expanding the resources of the hospital and improving the quality of care (Kvedar et al., 2014; Mueller, Potter, MacKinney, & Ward, 2014). The efficiency construct gave hospitals a financial ownership in a patient's recovery and successful outcome that did not exist before this construct's implementation.

Cost saving opportunities need to be a top priority for hospital administrators in this new payment environment. Ross et al. (2013) estimated hospitals could potentially save $5.5 to $8.5 billion nationwide by congregating observation patients. This estimate was astounding, and each hospital needed to do the analytics to determine their predicted savings (Cohen, Amarasingham, Shah, Xie, & Lo, 2014). Observation patients had

symptoms physicians need additional test results before deciding on whether the patient needed to be admitted to the hospital or go home. These patients can remain in an observation status up to 48 hours. Keeping these patients congregated allowed nursing resources to focus on the specific needs of these patients as physicians review results and made decisions on whether to admit or discharge (Zuckerman, Sheingold, Orav, Ruhter, & Epstein, 2016). These patients do not need higher levels of care and comingling them in with higher level admitted patients created confusion regarding the care each patient needs.

The VBP program was a comprehensive program which was the most innovative payment methodology in 2017. CMS used innovative technology to manage the high volumes of data received by hospitals and the Department of Health and Human Services to ensure the success of the program (Brennan, Oelschlaeger, Cox, & Tavenner, 2014). The technology enabled CMS to provide individual hospital results as well as benchmarking against peers to promote improved health care quality, which was a foundational objective of the program (CMS, 2013; Glance et al., 2014). As proven in prior studies, the publication of results motivates hospitals to meet and improve their results.

In 2017, anyone could visit www.medicare.gov/hospitalcompare and put in his or her local zip code or hospital name, and within seconds the site would provide the user with numerous hospitals within 50 miles. The user could select up to three hospitals at a time to compare or add the hospital to their favorites to track performance (Austin et al., 2015). The hospitalcompare website provided comprehensive information about the

various metrics collected by CMS (Werner & Dudley, 2012). A user could download the entire current database, as well as the archived database. CMS pledged transparency in the hospital industry value based program (CMS, 2013). The website provided quality data for over 4,000 Medicare certified hospitals; not all hospitals participated in VBP program because of various designations excluding them from the program.

Information was publicly available to hospitals and patients alike since 2005 (Brooks, 2016). Hospitals needed to find innovative ways to take notice of their metrics available to their patients (Emami & Doolen, 2015). Hospitals needed to identify their key operations to improve any metrics keeping them from the high performing category. Lack of improvement in key metrics would result in reduced reimbursement and could result in strained resources (Iglehart, 2014). Hospitals should understand that the VBP program was the vision of Medicare for current and future reimbursement.

Literature Review Summary

In conclusion, this literature review focused on five topics. The first topic was the demonstration project initiated by CMS becoming the foundation for the current VBP program (Ryan et al., 2015). The demonstration showed only hospitals with strong financial performance volunteered to participate because of the need for the additional expense in meeting the quality metrics CMS established (Werner et al., 2011). The demonstration was the first program bringing pay for performance into the hospital industry paving the way for the innovation to the VBP program (Kahn et al., 2006). The CMS demonstration project resulted in favorable outcomes generating significant bonuses to the participants able to meet the quality metrics (Werner & Dudley, 2012).

Although this program was only one dimensional, the demonstration showed hospitals could make improvements in quality of care when incentivized to do so.

The second topic reviewed the various research studies looking at pay for performance programs and their correlation to quality of care. The first study examined the payment methodology of DRG as compared to various quality metrics (Turner et al., 2015). However, the DRG methodology has no pay for performance indicators included, and therefore no correlation to quality (Mihailovic et al., 2016). The next study investigated patient centered medical homes as a best practice in improving patient health outcomes by reducing volume in the emergency room (Carrillo et al., 2014). However, reducing emergency room volume negatively affected hospital reimbursement fee for service model in place indicating a broader methodology was necessary to improve patient outcomes in various health care settings (Dong, 2016). The third study focused on incentives to improve quality which improved access to care (Bonfrer et al., 2014). This study provided the foundational need for patients having access to care to improve their health.

The next study focused on transparency of metric results amoung all the providers (Greene et al., 2015) The study gave support to public knowledge of results can improve performance. The fifth study looked at partnerships created in the community to support patients (Sandberg et al., 2014). This concept supported the need to consider the full continuum of care to ensure the overall quality of patient outcomes. The next study tested the patient safety program specific metrics a hospital needed to meet to avoid penalty (Rajaram et al., 2015). This study indicated that hospitals would improve safety and

quality to avoid the penalty, but would not continue to improve beyond the required metric. The final study focused on Medicare Part D adherence metrics which was the closest type of study supporting VBP (Young et al., 2014). This study demonstrated the innovations pharmacies had implemented to ensure patients stay on track with their medications by reminding patients when refills were required and provided individual patient education.

The next focus of the literature review included an examination of vulnerable patients defined as uninsured, low income, are racial or ethnic minorities, and did not have easy access to health care (Bacharach et al., 2012). Vulnerable patients had difficulty accessing care and tended to access care through the emergency room of nonprofit hospitals who cannot turn them away (Neuhausen et al., 2014). The inability to turn away patients forced hospitals to treat these patients in the highest cost environment with reactive care with no ability to provide ongoing health management (Cook et al., 2014). This population required hospitals to create innovative programs to meet the needs of the patients and not negatively affect the VBP metrics.

The next topic of focus was on health care payment reform. The significant financial burden of health care costs drove the need for payment reform (Martin et al., 2015). CMS tried as early as the 1980s to contain costs with the implementation of the DRG payment methodology, which only made individual hospitals more efficient in a disparate health care system. The disparate system drove health care costs to continue to rise to the level of $3 trillion in 2014 (Martin et al., 2015). The ACA of 2010 mandated three programs for CMS to implement to slow the cost of health care costs with a focus

on hospitals. The first program focused on reducing readmission rates within 30 days of discharge (Sheingold et al., 2016). The purpose of this program was to ensure hospitals do not discharge patients prematurely and to ensure a post-acute health care plan to assist in the patient's full recovery. The study measured a full recovery by the patient not getting readmitted to the hospital for the same illness. The second program focused on preventable HACs (Schmocker et al., 2015). This program required hospitals to indicate if a condition was POA, HAC, or exempt (Redondo-Gonzalez et al., 2017). Barnard et al., (2015) indicated this requirement allowed CMS to disregard the HAC and not pay hospitals a higher rate when the patient's condition worsened because of a HAC.

The final focus of the literature review was VBP, the third mandated program from the ACA of 2010. This program reduced Medicare reimbursement initially and then provided opportunity through meeting defined metrics for hospitals to earn the lost funding and additional reimbursement back based on performance (Das et al., 2016). Since this was a redistribution program, hospitals lost reimbursement for other hospitals to improve reimbursement (Bosko et al., 2016). CMS had a goal to increase a significant portion of their payments to the pay for performance methodology by using the hospital industry and the VBP program as the foundation for pay for performance programs (Brooks, 2016). VBP was the focus of this study to investigate the correlation between the constructs of VBP and program service revenue in nonprofit hospitals located in the tristate area of New Jersey, New York, and Pennsylvania.

Transition

Health care costs were on the rise, and the ACA of 2010 mandated health care payment reform to transform the cost curve. This quantitative correlation study focused on the VBP constructs compared to program service revenue. The focus of this study was to create an analysis for hospital business leaders to use as a foundation to apply the same concepts to their organizations. The population was nonprofit hospitals located in the tristate area of New Jersey, New York, and Pennsylvania. The null hypothesis stated no correlation existed between the VBP constructs compared to program service revenue. The VBP theoretical framework focused on transforming a pay for performance methodology to a health care setting. This study results will assist hospital business leaders with valuable information on how VBP correlated with financial performance while supporting improving health care quality in society.

The next sections of this study focused on the actual research to prove the null or alternate hypothesis. The section also included an outline of the data gathering including the role of the researcher, identifying the participants, and data collection method and design. The third section will be the actual collection of the data analyzed using SPSS version 21 to establish whether a correlation existed between the VBP constructs compared to program service revenue.

Section 2: The Project

The focus of section 2 is to outline the research project in detail. Section 1.1 states the purpose statement. In Section 2, I outline my role as the researcher and the identification process for participant selection. I then focus on the research method and design including support for the specific selections of both. I also focus on the actual data selection process, which included population and sampling, steps to ensure ethical research, data gathering instruments and gathering techniques. In the remainder of Section 2, I focus on the methods for data analysis and ways I ensured study validity.

Purpose Statement

The purpose of this quantitative correlation study was to provide hospital business leaders with a reference study showing the correlation between VBP reimbursement and program service revenue. The focus of this study was the relationship between VBP quality domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency compared to program service revenue. The independent variables are the domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency. The dependent variable was program service revenue. The targeted population consisted of nonprofit hospital business leaders located in the tristate area of New Jersey, New York, and Pennsylvania. The implications for positive social change included the potential to provide some hospital business leaders a better understanding of the correlation between the VBP reimbursement model, which included domains of clinical process of care, patient experience of care, and outcomes on program service revenue. This understanding could be foundational in the decisions made to

improve the financial performance and ongoing stability of the nonprofit and safety net hospitals in the region of this study.

Role of the Researcher

The foundational role of researchers in the data collection process was to identify a study population to provide a viable sample supporting statistically accepted results to the research question (Wester, Borders, Boul, & Horton, 2013). The researcher's goal in a quantitative study is to generalize to larger populations requiring a quality selection of the sample population (Wester et al., 2013). The focus of quantitative studies is to examine relations between measurable variables with statistical testing to see whether the correlation is supported (Landrum & Garza, 2015). The researcher's role is to complete the statistical testing and provide an analysis of the results proving or disproving the null hypothesis.

My professional experience is more than 20 years in hospital revenue cycle, which has included ensuring the hospital received payment for services rendered. The complexity of the hospital industry payment systems requires knowledge of regulations and contracts to implement extensive processes to ensure compliance and secure reimbursement (White, Reschovsky, & Bond, 2014). Prior experience enhanced my knowledge and understanding of the research phenomenon (Leedy & Ormrod, 2012). In this study, no direct contact with the research participants minimized the potential for bias in data collection and analysis and eliminated the concern for the protection of human subjects in research as outlined in the Belmont Report protocol (Delen et al.,

2013). My experience and absence of contact with participants, minimized biases as much as possible in this study.

Participants

The location of nonprofit Medicare hospitals for this study was in New Jersey, New York, and Pennsylvania. Establishing clear specification of the sample selection and eligibility improved both the reliability and validity of the study (Beslin & Tasic, 2012). The U.S. government provided the most valuable published sourcees of information (Beslin & Tasic, 2012). The selection process started with all hospitals listed on the data.medicare.gov website. This CMS website provided all hospitals registered with Medicare. Hospitals must participate in the Medicare program to be included in the VBP program. The second criterion was the public posting of the hospital's IRS Form 990. The IRS 990 confirmed the nonprofit status of the hospital and is an accurate source, which required all hospitals to report information consistently. Using U.S. government sponsored resources assisted in the accuracy of the selection process.

Research Method and Design

The selected method and design support the research question for this study. The method selected was quantitative, and the design was a nonexperimental correlation. In the following sections there is a justification for the selection of the research method and design.

Research Method

The method of this study was quantitative to verify relationships, if they existed, among variables (Cokley & Awad, 2013). The data came from U.S. government

published public resources to ensure the accuracy of the variables (Beslin & Tasic, 2012). The quantitative method does provide the ability to test the relationships between (a) clinical process of care, (b) patient experience of care (c) outcome, and (d) efficiency compared to program service revenue. Ontologically, the base of the quantitative paradigm is in facts (Jackson, 2015). Quantitative methodology is powerful in financial analysis which supports the relationship in this study with program service revenue (West, 2015). In summary, the quantitative method was most appropriate for this study.

In contrast to quantitative methodology, the qualitative methodology focusees on the dynamic information not exactly known or determined (Jackson, 2015). The qualitative method relies on the researcher to intuitively grip the often-unstructured research (Allwood, 2012). The qualitative study method usually focuses on understanding the nature of the research problem and interprets meanings from people's beliefs and practices (Baškarada, 2014). The qualitative method does not test hypotheses (Baškarada, 2014). The characteristics of the qualitative methodology did not meet the needs of this study.

The final method, mixed method enhances and triangulates findings from qualitative and quantitative methods (Jackson, 2015). This mixed method is the appropriate method when research questions required different methods to overcome weaknesses of using only one method (Afrifa & Tauringana, 2013). The mixed method requires the gathering of qualitative data and quantitative data. However, this study only had quantitative data, which did not support the use of the mixed method (Caruth & Amberton University, 2013). After the review of the three methods available, I decided

that the quantitative method was the appropriate method for this study, however, in the future, researchers may use the mixed method to minimize the disadvantages of using only one method.

Research Design

The design of this study supported analysis of the relationship between four independent variables and one dependent variable without causation. The research design selected met the nature of research question and analysis techniques (Wester et al., 2013). The correlation design included an examination of the relationship between the independent and dependent variables (Cohen & Cohen, 2003). In contrast, the experimental and quasi experimental designs focused on cause and effect relationships between variables, which are not the focus of this study (Schwartz et al., 2015). The correlation design met the nature of the research question and analysis techniques and was the appropriate design for this study.

Population and Sampling

The selection of nonprofit Medicare hospitals was from the data.medicare.gov website. This website provided all Medicare hospitals in the United States with the ability to filter the data by state, hospital type, and hospital ownership to identify the population needed for this research study. The focus of this study was in New Jersey and surrounding states because of the location of my place of employment and interest. The selected hospitals were in New Jersey, New York, and Pennsylvania. The hospital type had to be acute care, and the ownership had to be voluntary nonprofit private/other. All

hospitals fitting the criteria were used in the study to ensure the sample size was large enough to provide a 95% confidence rate with four independent variables.

A confidence of 95% was used to determine the sample size resulting in a sample needed of at least 129. A confidence rate of 95% was the gold standard of research (McLaughlin, 2013). In addition, a large sample size was better than a small sample size to reduce error when using nonprobability sampling and to increase statistical power (Tavakol & Sandars, 2014). The purpose of the study was to test the hypotheses and measure whether a correlation existed, therefore, using a lower error probability provided reliable results hospital administrators could respect (Ali & Bhaskar, 2016). The published outcomes could be a reference document for hospital administrators; therefore, ensuring accuracy was critical for professionals to rely on the results.

The limitation of the geographical area was to ensure the results carry more weight to the hospital administrators located in the geographical location rather than a national study (Matthews, 2013). Geographic precision improved the quality of the results because of the economic patterns from different geographic locations (Spielman, Folch, & Nagle, 2014). The geographical difference of the Northeast included major cities within driving distance for all patients minimizing the access disparities (Tavakol & Sandars, 2014). The tristate area included Pittsburgh, PA; Philadelphia, PA; and New York, NY; which all had major health care facilities that were only six driving hours apart making them geographically accessible and comparative for patient care and fit the needs of this study.

The strength of this sample size and geographical requirements provided useful results to the hospital administrators within the geographical area. This geographical limitation still allowed the extrapolation of the results to the United States, knowing geographical groupings were imperative to ensure accurate correlations. The focused sample size and geographic constraints may minimize variability in the results (Tabachnick & Fidell, 2012). The strength of the study was also in the sample size with a 95% confidence rate. The statistical software calculated the appropriate sample size presented in Figure 2.

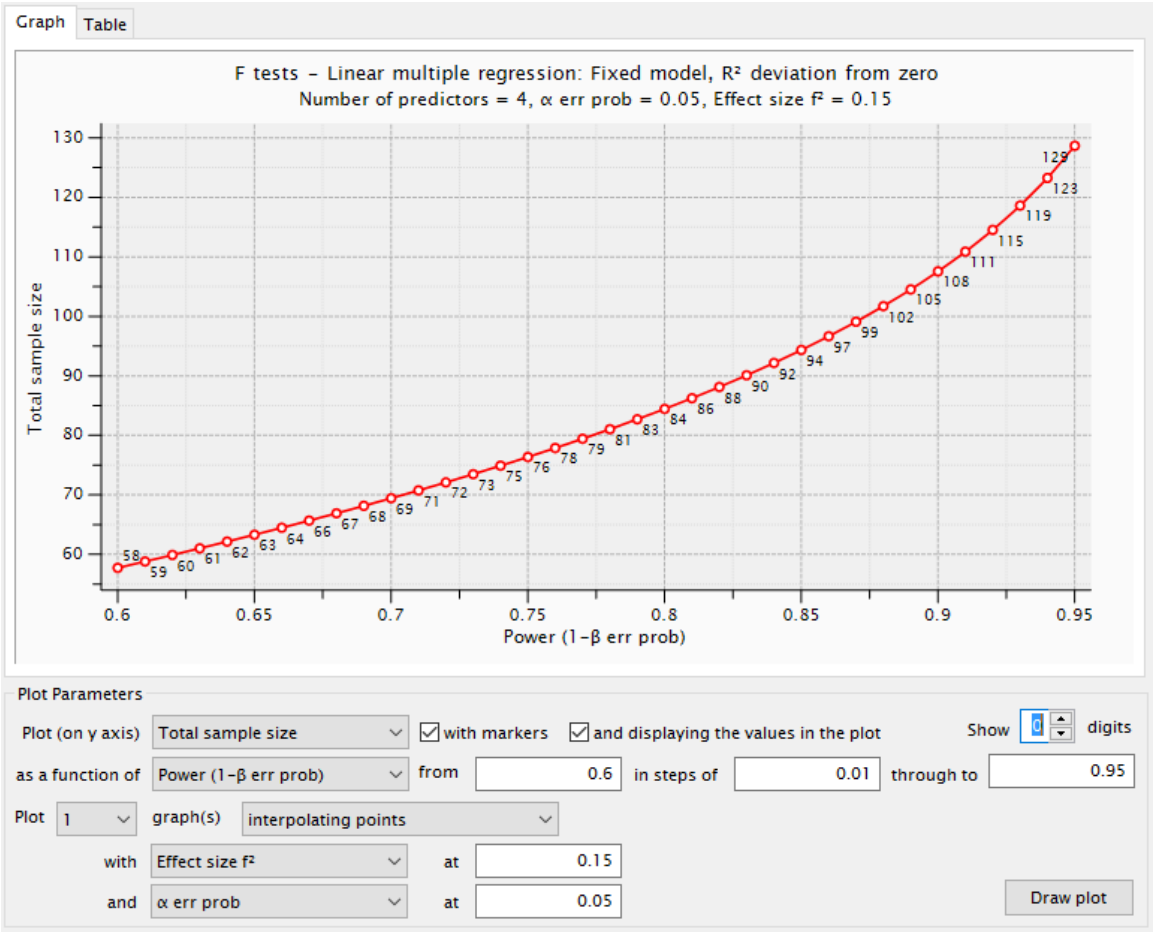

Figure 2. A priori sample size (N=129) generated by using the free G*Power 3.1 software by Faul et al. (2009).

Ethical Research

Research must be ethical to be relevant (Snowden, 2014). Ethical research must consider a balance of agreed values, do good and do no harm (Snowden, 2014). Researchers must treat participants ethically by maintaining privacy, gaining informed consent and avoid deception (Kaczynski, Salmona, & Smith, 2014). In this doctoral study, all data was from public governmental sponsored databases. Privacy was crucial to the hospitals used in the analysis. Therefore, each hospital was assigned a number in the form of H1, H2, and H3 instead of their name for anonymity. A password protected Microsoft Excel spreadsheet had the cross reference to the identity of the hospital. The spreadsheet indicated the number used for reference in the study with the individual hospital demographics correlating to the number assigned. All the study data was available publicly. Therefore, no consents were required. If the data were not in the public domain, an informed consent would be necessary to use the data (Kaczynski et al., 2014). By using governmentally sponsored websites, the integrity of the data was indisputable with the governmental oversight, regulations, and penalties for falsifying the data (Beslin & Tasic, 2012). This study met all ethical standards and presented no issues of violation.

The selection process could create bias in data collection and interpretation (Beslin & Tasic, 2012). To avoid bias in the selection process, I first gathered data of all hospitals meeting the established criteria. A separate document contained the demographic information, to ensure that the identity of selected hospitals was not easily known. In addition, the use of random sampling function in Microsoft Excel deidentified

the spreadsheet to meet the sample size required. Upon completion of the analysis, the research data was stored for 5 years in a password protected file in a password protected cloud storage site. At the end of the 5 years, I destroyed the data. The summary of key findings was available to any interested parties upon request.

Data Collection Instruments

The constructs used in the conceptual framework in this study are aligned and support the research question (Wester et al., 2013). Instrumentation used must provide a valid and reliable measurement of the constructs for a study to be considered viable and trustworthy (Wester et al., 2013). The data for this study was public information contained in archived databases. The data for this study was historical and from two sources. The potential sources identified for this study was the CMS hospitalcompare database and the Guidestar database. Both the hospitalcompare and Guidestar databases contained reliable information researchers used in various studies regarding CMS's rating system on hospitalcompare and financial research for not for profit entities.

The CMS hospitalcompare database provided information used in the VBP reimbursement model. The database was the source used by CMS to calculate the actual rating for each construct in the VBP program. This database included information on every hospital registered with the Medicare program (Dor et al., 2015). Access to the database was free to the public and considered a reliable source.

The Guidestar database was one of the largest databases of information on not for profit organizations (Shea & Hamilton, 2015). Guidestar published previously filed IRS

990 forms for every not for profit entity. Hines (2003) reported access to the database was free to the public, and the data came directly from the IRS.

Data Collection Technique

The data collection process must meet the needs of the study design and purpose (Tavakol & Sandars, 2014). Data collection in quantitative research can bring a breadth to a study by gathering data from many participants (Venkatesh et al., 2013). The ability to use Internet technology for data collection could lead to more precise assessments of dependent measures (Kostewicz, King, Datchuk, Brennan, & Casey, 2016). A disadvantage of this study was the data in the U.S. government Internet databases tend to lag approximately 1 to 2 years (Austin et al., 2015). The U.S. government internet databases were secondary data since CMS collected the data for another purpose (Johnston, 2014). Using U.S. government databases provided the advantage of the obtainability of information and from a reliable source. The disadvantage was data tended to lag approximately 1 year, not providing the most recent data for the study. However, the U.S. government databases provided the best resource to test the hypotheses.

The data collection process started by setting up a login on data.medicare.gov website followed by setting up a login to allow saved filters to be set up to ensure consistent selection of data meeting the criteria of the study. The filter for states was New Jersey, New York, and Pennsylvania. The hospital type filter was acute care hospitals and hospital ownership on voluntary nonprofit private/other. These filters remained on file for easy access and reference.

The next step was to download these reports by state and combined them into one password protected Excel spreadsheet called *rawdata* in my doctoral study folder. This rawdata Excel spreadsheet was used to look up each hospital on medicare.gov/hospitalcompare to locate data for the independent variables of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency. The data look up process eliminated non reporting hospitals from the study. The raw data spreadsheet was saved again into another password protected Excel spreadsheet named *VBPdata*. The purpose of renaming the spreadsheet at each step was to preserve the data collection trail which could be subject to audit. The location of the dependent variable and final data element of program service revenue was the guidestar.org website. The guidestar.org website provided all IRS Forms 990 filed by nonprofit entities in the United States. Each hospital listed on the VBPdata spreadsheet was researched on the guidestar.org website and had Line 9 from the organization's IRS form 990 program service revenue recorded. This spreadsheet was password protected into a file named *VBPdata_PSR*. Once all the data collection was complete, the data was deidentified by replacing the name of the facility with a number corresponding to the row in the Excel spreadsheet and saved in a password protected spreadsheet named *Gubbine-FinalData*. The password protected Microsoft account stored all the spreadsheets from the data collection process in the Microsoft cloud storage.

Data Analysis

The research question guiding this study focused on identifying if a relationship between VBP reimbursement based on the quality domains of (a) clinical process of care,

(b) patient experience of care, (c) outcome, and (d) efficiency compared to program service revenue exists. The null hypothesis stated, "Null Hypothesis (H_0): No significant statistical relationship exists between VBP reimbursement based on quality domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, (d) efficiency, compared to program service revenue". The selection of a statistical analysis method depended on the research question, the number of variables in the study and measurement scale (Tabachnick & Fidell, 2012).

Verifying the statistical analysis methods for completeness, accuracy, and consistency were important to ensure reliable data (Beslin & Tasic, 2012). Reviewing data for missing or invalid information before performing any statistical analysis was critical. If the data set was missing more than one of the independent variables, it was removed from the dataset to protect the integrity of the results (Beslin & Tasic, 2012). VBP reimbursement methodology began the beginning of CMS's 2013 fiscal year, which started on October 1, 2012. Although approximately 3,000 hospitals had their reimbursement linked to the VBP reimbursement methodology by CMS, only an estimated 87% or about 2,600 reported the required data (Das et al., 2016). Knowing almost 13% or 400 out of 3,000 hospitals would not have complete data required a full review of the data sets before analysis. The review included identifying if any data values were extremely outside the normal distribution (Tabachnick & Fidell, 2012). The use of scatterplot is a tool commonly used to check for the presence of outliers for removal from the dataset to eliminate distorted results (Tabachnick & Fidell, 2012). A scatter plot was created to identify outlies, however, none existed, and no data was eliminated.

Quantitative researchers used statistical procedures to organize and interpret the numeric data (Tavakol & Sandars, 2014). Using the correct statistical technique was important ensuring the tests applied to variables in the study (Wester et al., 2013). The first step in transforming raw data into understandable information was to use descriptive statistical analysis for interpretation (Boesch, Schwaninger, Weber, & Scholz, 2013). Using descriptive statistics to check for data integrity included checking to validate variables were within range, variables were present, and the standard deviation was plausible (Tabachnick & Fidell, 2012). Tabachnick and Fidell (2012) recommended using the SPSS version 21 program when doing several versions of analysis on the same dataset.

The first level of tests of the variables included a histogram, mean, standard deviation, skewness, minimum and maximum (Bradley & Brand, 2013). Correlation analysis tested the relationship between the independent variables with the dependent variable (McLaughlin, 2013). A correlation coefficient established whether a linear relationship existed between the dependent and independent variables individually (Zeng, Chen & Wang, 2017). A perfect correlation result would equal to +1, converse no correlation result equaled -1 (McLaughlin, 2013). A correlation coefficient value of .50 to 1.0 was considered a strong relationship, .30 to .49 as a medium relationship and 0.01 to 0.30 resulted in a minor relationship (Tabachnick & Fidell, 2012). In summary, the correlation coefficient must be close to -1 to support the null hypothesis.

Multiple regression analysis was a set of statistical techniques which assessed the relationship between one dependent variable and multiple independent variables which

applied to this study (Tabachnick & Fidell, 2012). The statistical analysis required rigorous mathematical calculations to explain variances (Donaldson, Qiu, & Luo, 2013). The regression analysis produces a graphical illustration to measure the effectiveness of the test's fit to the study (McLaughlin, 2013). Multiple regression analysis provided the most reliable results to test correlation relationship between research variables and was considered be used in this study (Wester et al., 2013). Tests such as analysis of variance (ANOVA) and chi square tests are not appropriate for this study because the level of measurement was at intervals which do not apply to this study (Bettany-Saltikov & Whittaker, 2014). Only tests appropriate for correlation were in the analysis.

To effectively use multiple regression analysis, a researcher needs to know three important assumptions regarding the data. First, regression analysis assumed the measurement of the independent variable is without error (Tabachnick & Fidell, 2012). Second, the assumption of normality assumed a normal distribution of errors of prediction around each dependent variable (Tabachnick & Fidell, 2012). A further assumption was a linear relationship existed between the predictor and outcome variables (Boslaugh, 2013). This study fulfilled these three assumptions.

There are four important steps followed to ensure accuracy and confidentiality. First, the use of SPSS version 21 for accurate data analysis. Second, the data was in a password protected file in a password protected cloud storage location. Third, make key findings available to interested parties upon request. Moreover, the final step was to destroy the records 5 years after the completion of the study.

Study Validity

Study validity was an important aspect of all research and reflects the strength of the documented findings (Boesch et al., 2013). Researchers needed to validate their research findings for business leaders to rely on the study (Tabachnick & Fidell, 2012). Consequently, researchers must evaluate the weaknesses of the quality of their conclusions and develop methods to overcome data flaws (Redondo-Gonzalez et al., 2017). The subsequent section described external, internal, and statistical conclusion validity threats and the approaches taken to minimize the threats.

External validity referred to the ability to generalize the findings to other populations (Boesch et al., 2013). A researcher needed to evaluate the study findings and apply to other populations and geographical locations meeting the profile of the participants (Delen et al., 2013). External validity cannot be assumed, and three key questions needed to be asked to establish transferability, (a) what was the operational measure, (b) was the sample representative of other populations, and (c) were participants similar (Boesch et al., 2013). If the goal of the researcher was to transfer findings to a larger population than a sample population must be large enough to ensure transferability (Tabachnick & Fidell, 2012). Researchers need to minimize the bias in the sample of a specific population before extrapolating to a larger populace (Delen et al., 2013). In this study, the one factor minimizing the use of generalization was geographical boundaries; however, the sample was large for the research question, and the findings could be generalized to other geographically similar samples.

Internal validity focused on the credibility and causal relationships of the study (Boesch et al., 2013). Internal validity is also about inferences regarding cause and effect relationship (Tabachnick & Fidell, 2012). Another way to look at internal validity is whether the detected covariation between independent and dependent variables represent a causal relationship (Venkatesh et al., 2013). The goal of this study was to provide support for association and correlation, not causation. Therefore, no significant threats to the internal validity of this study existed.

Paying attention to the details of all aspects of a study was important to mitigate validity threats and produce high quality research findings (Boesch et al., 2013). Statistical conclusion validity was the implications of the correlation between the independent and dependent variables (Venkatesh et al., 2013). Statistical conclusion validity was also about the use of relevant statistics to reach accurate conclusions about accepting or rejecting hypotheses (Feruh & Tasic, 2012). Risks to statistical conclusion validity could comprise of low dependability of measures, random diversity of cases, and low statistical power (Boesch et al., 2013). The best way to mitigate for statistical conclusion validity was to use multiple statistical analysis tools to minimize validity threats in the research findings (Tabachnick & Fidell, 2012). Researchers should use a variety of approaches to overcome threats of validity (Bettany-Saltikov & Whittaker, 2014). In this study, I used the gold standard of research of a 95% confidence probability to increase the sample size and improve validity (McLaughlin, 2013). The focus of the study was a defined population of acute care nonprofit hospitals reducing the risk of outliers. Finally, the actual data came from the reliable sources of the U.S. government

databases improving the accuracy of the data used in the quantitative analysis. These three approaches supported valid outcomes of this research study.

Transition and Summary

The focus of section 2 was a detailed outline of the proposed project. The outline included the purpose, researcher role, participant selection, research method and design, population and sampling. This section also addressed ethical research and validity concerns and ways to mitigate those risks. In addition, the section included an outline of data procedures for instrumentation, collection techniques, and data analysis. The next section focused on actual findings from the study, applications to professional practice, implications for social change and recommendations for action and further research.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this quantitative correlational study was to provide hospital business leaders with a reference study showing the relationship if one exists between VBP reimbursement and program service revenue. The specific business problem I addresed in this study is that some hospital business leaders do not have reference research that outlines whether the relationship exists between VBP reimbursement based on quality domains of (a) clinical process of care, (b) patient experience of care, (c) outcome, and (d) efficiency and program service revenue. The VBP program started in 2013.The program service revenue was analyzed starting 2 years prior to the start to determine whether the trend in overall program service revenue trended up or down as of the implementation of VBP through to 2015. The findings show that program service revenue trended upward suggesting that either VBP reimbursement did not reduce overall program service revenue or that hospitals found replacement revenue streams to compensate.

To further test the relationship, the Pearson correlation coefficient was calculated for 2013, 2014 and 2015, which were the years that program service revenue and VBP data were available. The Pearson correlation coefficient is one of the most widely used statistical tests for a linear relationship (Li, 2017). The results of the Pearson correlation coefficient show no statistically significant relationship exists between program service revenue and the VBP domains for years 2013 and 2015. A weak positive relationship exists between 2014 program service revenue and process of care domain; however, no

statistically significant relationship exists in the other domains. In summary, the null hypothesis is not rejected by the findings.

Presentation of the Findings

Descriptive Statistics

Research started by downloading a listing of all voluntary nonprofit hospitals located in the tristate area of New Jersey, New York, and Pennsylvania from the website data.medicare.gov. The downloaded information provided the raw data that included 290 hospitals. The next step required obtaining the VBP data for all hospitals in each study state from hospitalcompare.gov. All data for each state was downloaded and then matched to the 290 hospitals previously identified as being voluntary nonprofit, discarding all data for hospitals not included in the study. The next step required looking up each of the 290 hospitals on Guidestar.org to obtain the last 5 years of program service revenue. During the look up process, data was discarded for any hospital not having 5 years of program service revenue. The final step required a review of each hospital to ensure that all data required for the study was present, removing any hospital with an incomplete data resulting in the final data set of 129 hospitals. A complete hospital dataset included program service revenue from 2011 to 2015, bed size, and 2013 to 2015 VBP data. The final sample size meets the priori sample size (N = 129) generated by using the free G*Power 3.1 software by Faul et al. (2009) in Figure 2.

The first analysis performed is the mean, standard deviation, minimum and maximum, so the data is inspected for plausibility (Tabachnick & Fidell, 2012). The mean is the arithmetic average, the standard deviation is the deviation of the data in the

study, and the minimum and maximum define the range of the data (Ali & Bhaskar, 2016). Table 2 provides the results for each year included in the study. The review of the result for each variable is reasonable based on the research conducted. This critical first step ensures that the data used does not include data that could skew the results of the further analysis (Tabachnick & Fidell, 2012).

Table 2

Summary Analysis for Dependent and Independent Variables

Variable	Mean	Std. Dev.	Min.	Max.
2013				
PSR in dollars (000)	306,412	312,905	6,606	1,700,000
Clinical Process Domain score	58.0	17.0	2.2	100.0
Patient Experience Domain score	30.3	15.0	6.0	76.0
2014				
PSR in dollars (000)	323,452	330,862	8,986	1,890,000
Process of Care Domain score	52.1	18.7	3.3	94.4
Patient Experience Domain score	29.2	15.1	5.0	78.0
Outcome Domain score	48.5	6.0	10.0	95.0
Efficiency Domain score	22.4	28.8	0.0	100.0
2015				
PSR in dollars (000)	337,315	354,397	9,651	2,070,000
Clinical Process Domain score	55.9	18.9	10.0	95.7
Patient Experience Domain score	25.5	15.9	3.0	89.0
Outcome Domain score	48.9	16.4	7.1	100.0
Efficiency Domain score	18.3	27.6	0.0	100.0

Note. $n = 129$.

The next analysis performed was to compare program service revenue by bed size for the five years available. Bed size is a common characteristic used in research regarding hospitals to ensure the data is not skewed by small hospitals compared with larger hospitals (Mendez, Harrington, Christenson, & Spellberg, 2014; Strack et al.,

2014). The evaluation of this trend ensures an accurate comparison of program service revenue throughout the entire population of hospitals.

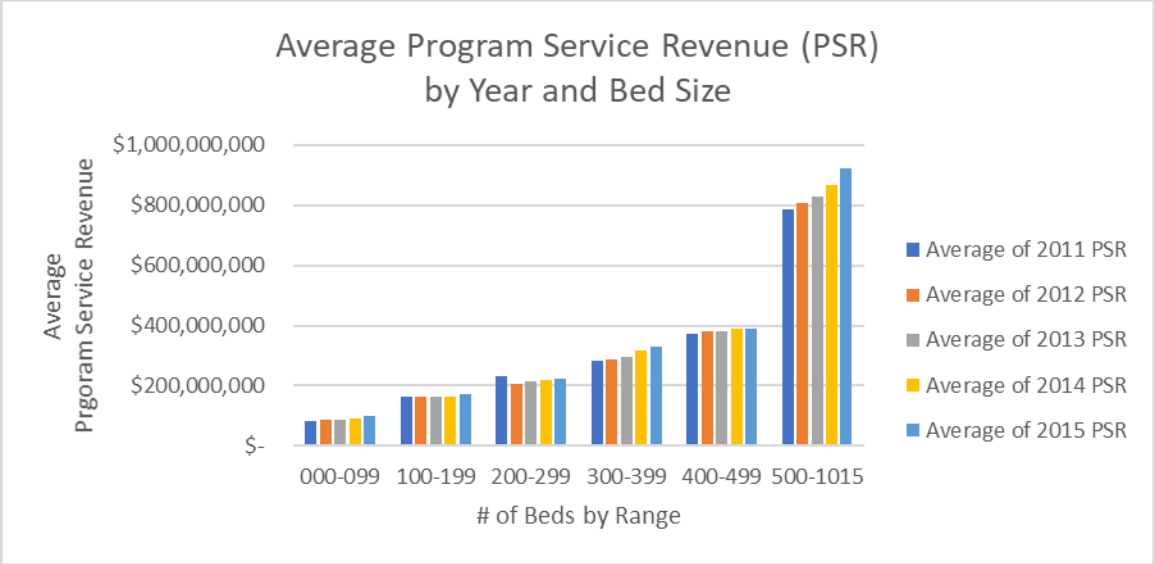

Figure 3. Average program service revenue broken down by bed size range indicated for the years of 2011 to 2015.

Figure 3 shows small increases in program service revenue starting before the VBP program continuing to the third year of the VBP program for hospitals with a bed size of 499 or less. Hospitals with bed size higher than 500 showed a stronger upward trend during the same period. The analysis shows that the implementation of VBP reimbursement by Medicare in 2013 has not had an overall adverse effect on program service revenue.

The next analysis performed was to graph the average VBP overall performance score by bed size. The average of total performance by bed size scores are displayed. The purpose of this graph is to see how hospitals are performing in the VBP program.

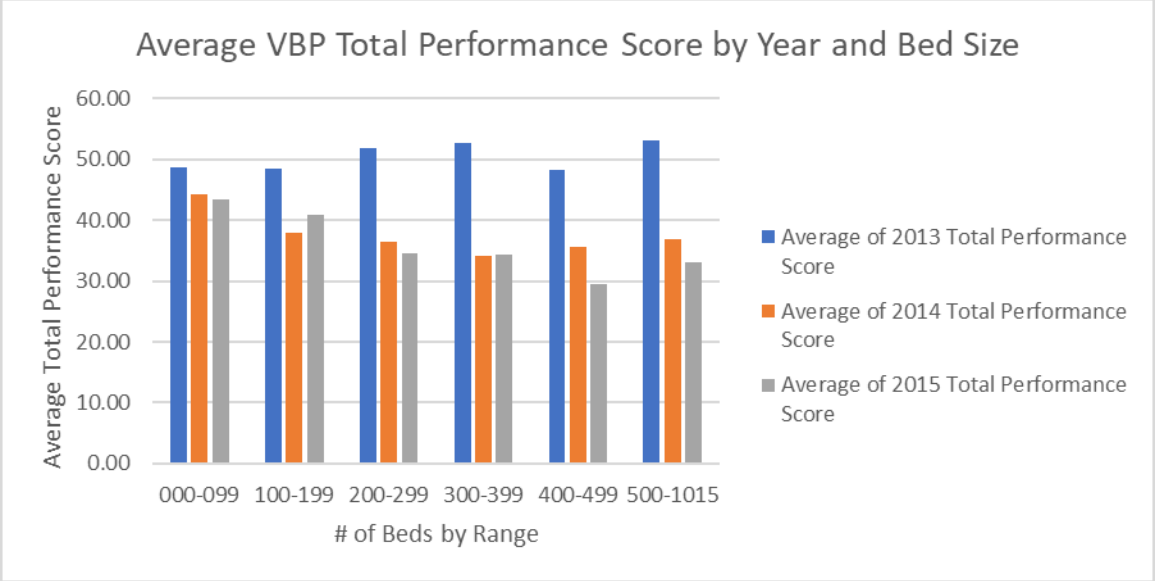

Figure 4. Average VBP total performance score broken down by bed size range indicated for the years of 2013 to 2015.

Figure 4 shows the hospital's total performance scores are declining as the VBP program matures with additional domains added to the measurement. The total performance is calculated by weighting the performance score for each domain based on the published criteria from CMS (Gilman et al., 2015). The scoring system starts at 0 as the lowest possible score up to 100, meaning the higher the score, the better the performance (Werner & Dudley, 2012). The graph in Figure 4 also shows smaller hospitals with beds of 199 or less are performing better than hospitals with a larger bed size. Comparing Figure 3 to Figure 4 results in a negative correlation between VBP performance scores and program service revenue.

To ensure the correlation exists between program service revenue and VBP performance further testing is required. The simplest test for correlation is a scatter plot graph which is used to establish a correlation between two variables visually (Tabachnick

& Fidell, 2012). Below are scatter plot graphs for each year of the VBP program comparing program service revenue and total VBP performance scores.

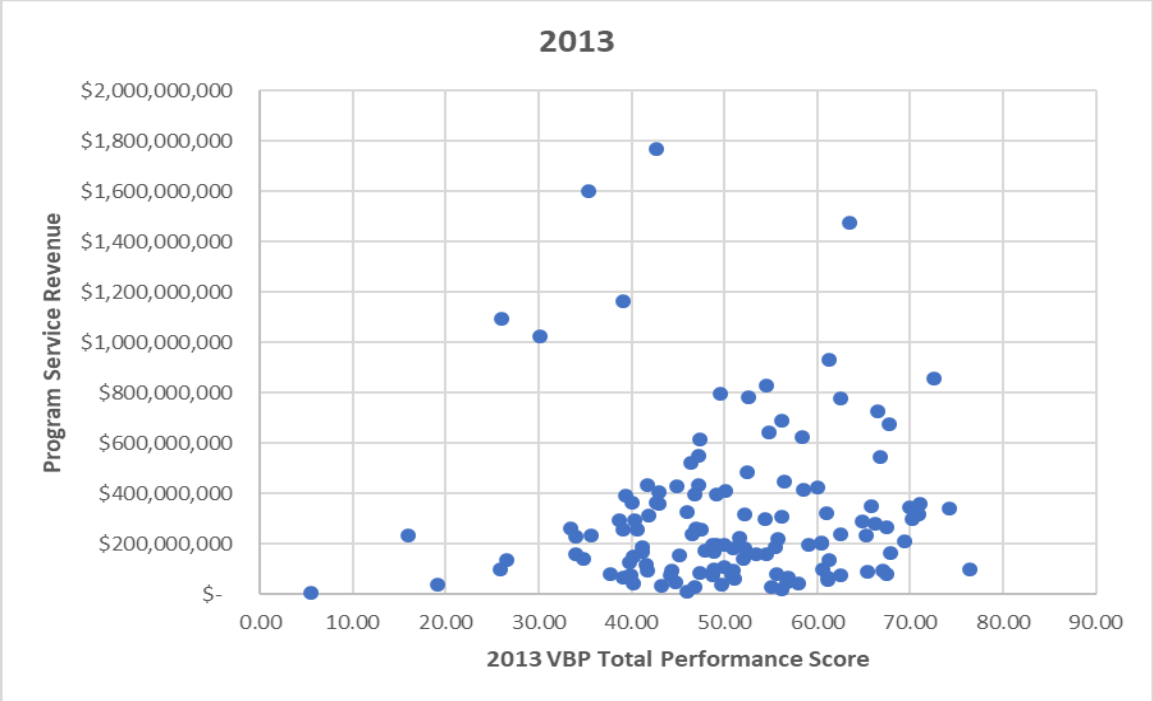

Figure 5. Scatter plot graph of 2013 Program Service Revenue in correlation with 2013 VBP total performance score.

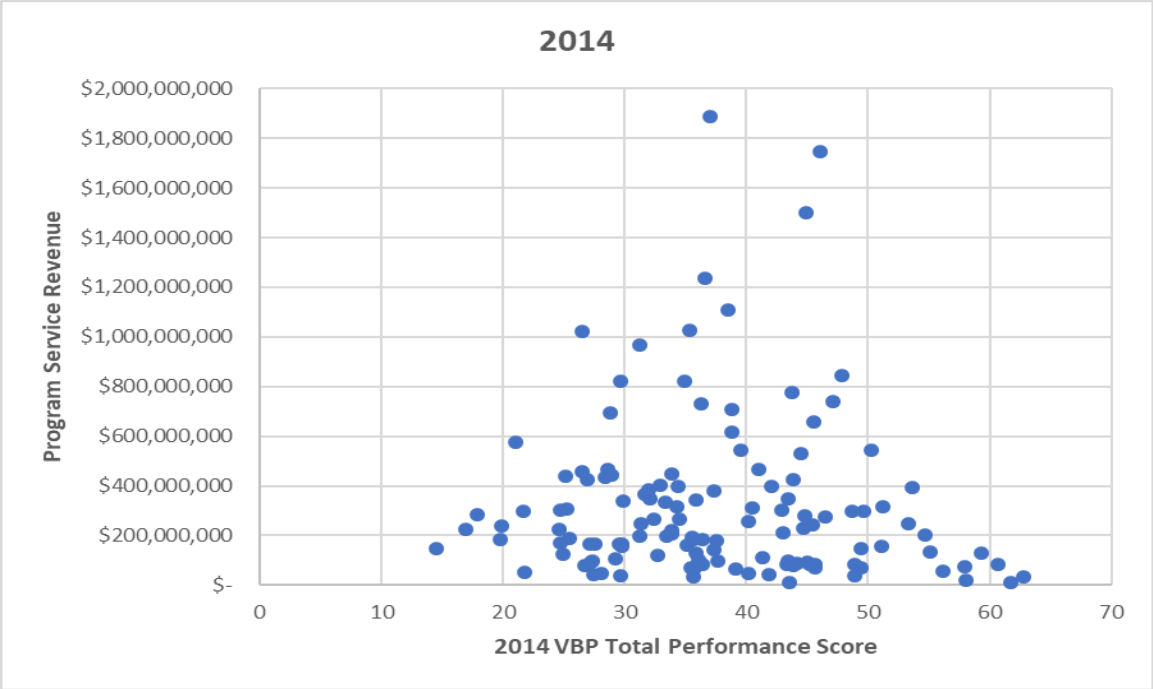

Figure 6. Scatter plot graph of 2014 Program Service Revenue in correlation with 2014 VBP total performance score.

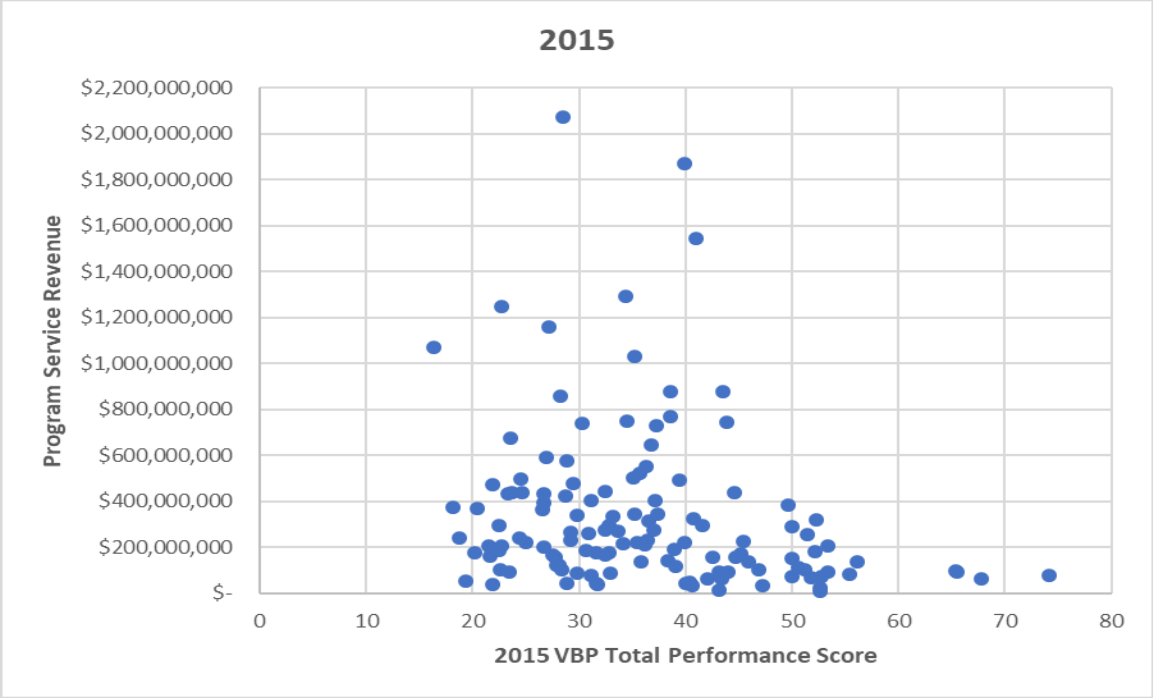

Figure 7. Scatter plot graph of 2015 Program Service Revenue in correlation with 2015 VBP total performance score.

The scatter plot graphs in Figure 5, 6 and 7 show no correlation between program service revenue and VBP total performance score. Most hospitals scored between 20 and 60 regardless of their program service revenue. The scatter plot suggest that outliers exist; however, they are not significant and will not skew further analysis. The scatter plots indicate that the answer to research question is that there is no correlation, but further analysis needed before concluding.

Further analysis to test the correlation between program service revenue (PSR) and the individual domain scores is required to answer the research question accurately. The next calculation completed was the Pearson's r correlation for the years of 2013, 2014, and 2015. The use of the correlation coefficient is because both the independent variables and the dependent variable are continuous (Li, 2017). The calculation of the pearson r correlation results can range between -1 and +1. Strong relationship results in a number close to -1 or +1, the closer to 1, the stronger the relationship (Tabachnick & Fidell, 2012). A -1 indicates negative correlations between variables and a +1 shows a positive correlation and the closer the result is to zero indicates no correlation (Cohen & Cohen, 2003).

Table 3

Pearson Correlation Results, 2013 PSR and Domains

Measure	PSR 2013
2013 Process of Care	.045
2013 Patient Experience	-.026

Note. * = p < .05, **=p < .01, ***=p<.001, two-tailed tests. n=129.

Table 4

Pearson Correlation Results, 2014 PSR and domains

Measure	PSR 2014
2014 Process of Care	.169
2014 Patient Experience	-.007
2014 Outcome	-.106
2014 Efficiency	-.074

Note. * = p < .05, **=p < .01, ***=p<.001, two-tailed tests. n=129.

Table 5

Pearson Correlation Results, 2015 PSR and domains

Measure	PSR 2015
2015 Process of Care	.089
2015 Patient Experience	-.053
2015 Outcome	.014
2015 Efficiency	-.096

Note. * = p < .05, **=p < .01, ***=p<.001, two-tailed tests. n=129.

The results in Table 3 and Table 5 show no significant relationship between the VBP domain results and PSR. Table 4 does show that the domain Process of Care has a slight positive correlation with a result of .169, however, it is not statistically significant. In addition in 2014, the domain outcome shows a slight negative correlation with the result of -.106, but still not statistically significant. The two remaining domains in Table 4 show no relationship.

The scatter plot graphs, and correlation coiefficient analysis showed no significant relathionship. The next step should be regression analysis, however, due to the lack of relationship already established the analysis was not performed. The primary goal of

regression analysis is to investigate the relationship between variables which has already established not to exist (Tabachnick & Fidell, 2012).

Applications to Professional Practice

Although the results did provide support to reject the null hypothesis, this study still provides value to hospital business leaders. The nonprofit hospital industry struggles as it serves the underserved and uninsured population in society (Bai & Anderson, 2016). This study shows nonprofit hospitals improving their revenue during this time of quality is driven health care. Medicare is the first to tie reimbursement to quality and hospitals are meeting that challenge. The results show improvement is needed in the quality constructs of VBP for nonprofit hospitals to continue to keep their businesses strong. The current amount of reimbursement tied to the quality constructs are not enough to reduce revenue significantly, however, as the percentage of revenue tied to quality increases, hospitals will need to focus on improvement of their performance scoring.

The future of VBP has potential to expand beyond Medicare and into many other commercial payers who are the core of the revenue in nonprofit hospitals (Tsai, Orav, & Jha, 2015). Hospitals will need to monitor their performance scoring and ensure they focus on improvements to raise scores now while only Medicare is using the metrics for a portion of their reimbursement, before the portion increases and includes additional payers (Reames, Ghaferi, Birkmeyer, & Dimick, 2014). Quality based care is becoming the expectation of the patient (Papp et al., 2014). That expectation has the potential to

become the norm forcing health care providers to ensure they provide quality service to all patients all the time.

Implications for Social Change

The results from this study suggest that hospitals are not improving their quality as the VBP criteria from Medicare broadens. This information is publicly accessible to everyone and allows patients to see actual results rather than the only resource being positive marketing campaigns. Public information has a positive effect on social change because patients have access to real results and can make informed choices based on published quality metrics.

Nonprofit hospital marketing campaigns will need to change focus and market actual results. Publishing results build transparency in the market place improving the knowledge of consumers. A hospital which is doing well with their quality metrics can easily market their results and provide information on how to validate them through public access websites. Consumers will become better informed and make better health care decisions. Better health care decisions will result in better health over all. Since a large portion of the US population is aging and elderly population is at the greatest risk for chronic diseases, this research supports the need validating access to quality health care (Kennedy et al., 2014). Educated choice in health care also results in healthier consumers and improved quality of life.

Recommendations for Action

Hospital business leaders need to pay attention to the results of this study. Although this current study does not indicate a negative effect on revenue overall, it does suggest that hospitals' performance metrics are on the decline as the requirements expand. Only the first three years of the VBP program were available. As the VBP program matures with more reimbursement tied to the metrics, the potential for a negative affect on revenue is more likely.

The results of this study have the potential to be disseminated at health care financial conferences such as the Healthcare Financial Management Association (HFMA) who has a national conference and various chapter conferences throughout the US. Publication of portions of the study in health care trade publications such as HFM (Healthcare Financial Magazine) and Modern Healthcare is another way to share the information with the proper audience.

This study could be the basis for training for health care executives suggesting to executives that although they are currently in a time of increased revenue, their quality metrics are on a downward trend. The trend of increased revenue cannot possibly continue with a downward trend in quality metrics as more reimbursement is tied to quality performance. These are only a sample of the variety of methods of publicizing the results of this study to the properly targeted audience.

Recommendations for Further Research

Further research on tracking the trends in revenue and quality metrics should be a focus over time. The VBP program is a young program that could change and evolve as it

matures. The correlation between revenue and quality metrics needs to be an ongoing review so hospital business executives can steer their organizations properly. The initial results of this study show that revenue is on an improved trend. However, this study was limited to correlating revenue to VBP performance metrics. An expanded study could alleviate the limitation of only using quantitative data for revenue measurement. Obtaining more details on revenue sources could provide better direction on whether hospitals are improving quality which is improving revenue or have hospitals found other revenue streams to fill in gaps lost by not meeting quality metrics.

Further research could include profit hospitals to see if they can perform better in quality metrics since they are not required to serve under and uninsured patients. This study only focused on the geographical area of New Jersey, New York, and Pennsylvania. An explanation of geographical area or focus on another area not located in the northeast US could result in different outcomes. The basis of this study could easily be replicated in different geographical areas to see if the location has a bearing on the results. As VBP matures and quality metrics expand beyond Medicare, this study provides the foundation for further research to explore the possible correlation between revenue and quality in the future.

Reflections

While conducting the literature review for this study, my comfort for the need of this study grew. As I continued utilizing resources, it was observed that a continued increase in resources on the topic existed displaying the increased interest. I had a bias that poor quality metrics would have a negative effect on revenue which was not proven

by this study. However, I did not allow my bias to get in the way of collecting objective data to prove or disprove my research question.

I was disappointed to find that there were no statistically significant results. In planning for this study and while writing this study, concerns about value based purchasing effect on hospital revenue came through my daily notices from various health care reporting services, such as Advisory.com, Modern Health and Health Financial Management Association. This program is still very young only beginning in 2013. I believe that the current amount of revenue linked to the VBP reimbursement model is not large enough yet to create the correlation that I expected. As the program matures and includes a higher percentage of revenue linked to this reimbursement model, I believe the correlation will materialize over time.

I found that collecting all the data needed for my study was exciting since all this data was not available to the public until the inception of the VBP program in 2013. I was amazed at how easy it was to obtain the data. Now knowing that all this reliable data is available to anyone helps consumers make better decisions about where to seek their health care and ultimately improve their health.

Conclusion

In Section 3, the findings of the study were presented indicating that there is no relationship between nonprofit hospitals program service revenue and VBP performance metrics in the years of 2013, 2014 and 2015. Despite the results that no significant statistical correlation existed, there are still applications to professional practice and implications for social change. My reflections focused on the expanded availability of

reliable information to the public to assist in making informed health care decisions. This study was foundational with the VBP program being in the infancy stage supporting continued research to track correlations between hospital revenue, costs, and profitability and quality metrics in the future.

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