
Healthcare Performance Excellence: A Comparison of Baldrige Award Recipients and Competitors

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Hospitals today face pressures from a variety of stakeholders to improve performance across a comprehensive scorecard, which has become the basis for value-based purchasing and reimbursement. This study investigates relationships between the effective application of the Malcolm Baldrige Health Care version of the Criteria for Performance Excellence (HCPE) and healthcare organizational performance. There have been many studies on the value of implementing the Criteria for Performance Excellence, but due to the lack of comparable contexts and common performance measures, analysis of the differences in performance between Baldrige Award recipients and nonrecipients has been limited. This study focuses on the common context of healthcare organizations in the same geographic region along with common metrics to analyze the impact of effective HCPE application. This study compares 34 Malcolm Baldrige National Quality Award Health Care recipients (2002-2011) to 153 competitors in their geographic markets using standard Centers for Medicare & Medicaid Services (CMS) performance measures to determine if there is a relationship between the effective use of the HCPE as an organizational excellence framework and the performance of healthcare organizations. Three categories of performance were explored including the process of care (23 measures), patient experience using the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey (10 measures), and outcome of care (six measures). Process of care and patient experience data included performance from October 2009 through September 2010, and the

outcomes of care measures covered performance from July 2007 through June 2010. While there was no significant difference in process of care results or outcomes between Baldrige recipients and their competitors, there was a significant difference in patient experience results. The most important finding in this study was that Baldrige recipients provided care equal to or better than competitors while at the same time providing a better patient experience. These results add to the growing evidence that the HCPE are a valid framework to align organizational design, strategy, systems, and human capital to create long-term effectiveness in an institutionalized high-performance culture.

Key words: Baldrige Award, Centers for Medicare & Medicaid Services, continuous improvement, Criteria for Performance Excellence, healthcare improvement, healthcare performance, patient experience, patient satisfaction, performance excellence, value-based purchasing

INTRODUCTION

Hospitals today are under pressure from a variety of stakeholders to improve quality, safety, clinical outcomes, and patient satisfaction while at the same time reducing costs. While estimates vary, James (2013) proposes that at least 210,000 deaths per year are associated with preventable harm in hospitals. The impact of poor quality healthcare extends beyond the hospital and patient and negatively impacts several

social and economic factors including lost wages, reduced productivity, higher legal expenses, and lower confidence in the healthcare system (Shalala 2007). In 2013, healthcare spending in the United States was \$2.9 trillion, or 17.4 percent of gross domestic product. The United States spends more of its wealth on healthcare than any other developed country and spends more on healthcare than it does on food (CMS 2013). Many studies have attempted to explain why the United States spends disproportionately more on healthcare, and some explanations include the high price of drugs, the abundance of new medical technology, the private nature and administrative complexity of the healthcare, aging population, reimbursement incentives under fee for service, poor quality, and limited access (Angrisano et al. 2007). While the U.S. healthcare system is the most expensive in the world, it underperforms 10 other nations: Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, and the United Kingdom (Davis et al. 2014). While a wide variety of government solutions have been considered with a few being implemented, the healthcare system in the United States is still expensive, getting more expensive, and underperforming. The problem is one of value (quality/cost).

The Affordable Care Act (ACA) created the Centers for Medicare and Medicaid Services (CMS) value-based purchasing (VBP) program to transition Medicare toward integration and alignment between payment and a comprehensive definition of quality. The VBP was designed to reward hospitals for improving the quality of care by redistributing Medicare payments so higher-performing hospitals in terms of quality receive a greater proportion of the payment than do lower-performing hospitals (CMS 2012). The current program includes three dimensions of quality: process of care, patient experience, and outcomes of care (see Table 1). Over the next several years, two categories of measures (efficiency and safety) will be added and the weights assigned to each type of performance measure will change to where eventually there are five categories

Table 1 Value-based purchasing program domain overview

Value-Based Purchasing Federal Fiscal Year		2013	2014	2015	2016	2017
Percent program contribution		1.00	1.25	1.5	1.75	2.0
Included in study						
1	Process of care	0.70	0.45	0.20	0.10	0.05
2	Patient experience (HCAHPS survey)	0.30	0.30	0.30	0.25	0.25
3	Outcome		0.25	0.30	0.40	0.25
Not included in study						
4	Efficiency: Medicare spending per beneficiary			0.20	0.25	0.25
5	Safety					0.20

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of measures, including process of care, patient experience, outcomes, efficiency, and safety (see Table 1). Value-based purchasing strategies are designed to reward hospitals financially for providing higher quality care, to bring about transformational changes in total care delivery, and to increase the level of shared accountability among providers (Miltenberger, Downs, and Greene 2012).

Historically, quality healthcare has primarily focused on the process of care and clinical results and outcomes. As the “bar” is raised to include a more comprehensive scorecard for quality, incorporating other dimensions such as patient experiences, it is not clear how traditional approaches to quality in healthcare will address these dimensions. Previous research on the value of the Baldrige Criteria for Performance Excellence (CPE) in various types of organizations (Hendricks and Singhal 1997; Evans and Jack 2003) and in healthcare (Goldstein and Schweikhart 2002) provides evidence that the CPE/Health Care CPE (HCPE) framework is useful for improving organizational performance. In addition, evidence from the 34 individual case studies (award application summaries) indicates the implementation of the more holistic systems approach based on

the HCPE will produce high performance across a comprehensive scorecard including patient experience, efficiency, and safety (Griffith and Pattullo 2009). While previous research and individual case studies provide evidence of the value of the HCPE in achieving performance excellence, it is not clear if effective application of the HCPE framework helps organizations achieve high performance better than other approaches to quality and performance improvement. One question identified by Baldrige Award recipient executives was “Why don’t stakeholders understand the benefits of performance excellence and the [Malcolm Baldrige National Quality Award] process?” (Latham 2008, 16). Part of the reason some stakeholders question the value is the limited empirical evidence demonstrating the value of performance excellence compared to other approaches. The purpose of this study is to determine if there is a relationship between the effective use of the HCPE as an organizational excellence framework and the performance of healthcare organizations. To accomplish this, the authors compare the performance of Baldrige Award recipients in healthcare to their competitors using standard CMS performance measures.

QUALITY IN HEALTHCARE

Quality in healthcare dates back to Florence Nightingale, who advocated for evidence-based nursing (McDonald 2001), and Ernest Amory Codman, who helped start the American College of Surgeons in 1910 (Mallon 2007). While similar to quality methods and approaches used in industry (Deming 1986; 1994), approaches to quality in healthcare have been primarily limited to a physician-centered view of clinical outcomes (Donabedian 1996; 2003) and lack a more holistic, value-based, patient experience view, which requires an integrated system of activities and processes (Baker 1993). However, many dimensions of quality and healthcare have shown connections between quality planning and process performance (Mutsch and Herbert 2010) and empowerment and

engagement in decision making and service quality perceptions (Snipes, Loughman, and Fleck 2010). Carter, Lonial, and Raju (2010) found clear linkages between both quality context and quality practices and overall hospital performance. In addition, open-system design concepts have been applied to the development of a comprehensive primary healthcare conceptual framework perspective (Hogg et al. 2008). The evidence suggests that both the quality practices related to clinical care results and the overall system or quality context are needed to ensure hospital performance. Finally, while a wide variety of healthcare improvement programs have emerged, such as the Physician Consortium for Performance Improvement (PCPI), Institute for Health Care Improvement (IHI), Leap Frog, and hospital accreditation programs including the Joint Commission, it is not clear to what extent these approaches to performance improvement create quality and value based on a comprehensive scorecard.

PERFORMANCE EXCELLENCE

While the quality of the individual clinical procedures and processes and the associated outcomes are essential to quality healthcare, they are not a complete definition of value. Patients experience healthcare delivery as a system from scheduling and admitting to full recovery when the patient no longer needs aftercare. The organization as a system of interdependent activities and processes is not a new idea and was proposed by W. Edwards Deming in Japan in 1950 (Deming 1986). While Deming’s concept of the organization production system has been used in practice, it was not until later that his overall system of production, quality, and financial performance was empirically tested (for example, Wayhan, Khumawala, and Balderson 2010). The CPE are a system of interrelated processes from leadership, strategy, and customer focus to people, processes, information, and analysis and the associated results across a comprehensive enterprise scorecard. The healthcare version (HCPE) framework is identical

to the original CPE except it uses language to assist healthcare practitioners understand how the criteria apply to their particular context. A nonprescriptive design, the HCPE framework is not based on any one management theory but instead allows for the integration of many management theories, concepts, and best practices required to ensure superior levels of performance and sustainability. While there have been many studies on the value of implementing the CPE, (for example, Hendricks and Singhal 1997; Evans and Jack 2003; Jacob, Madu, and Tang 2004) due to the lack of comparable context (for example, industry) and common performance measures, there has been little analysis of the differences in performance between Baldrige Award recipients and nonrecipients in the same industries. This has limited most published analyses to comparisons of publicly reported financials, which are highly context dependent, influenced by numerous other variables, and primarily limited to comparison of financial performance between publicly traded-for-profit companies.

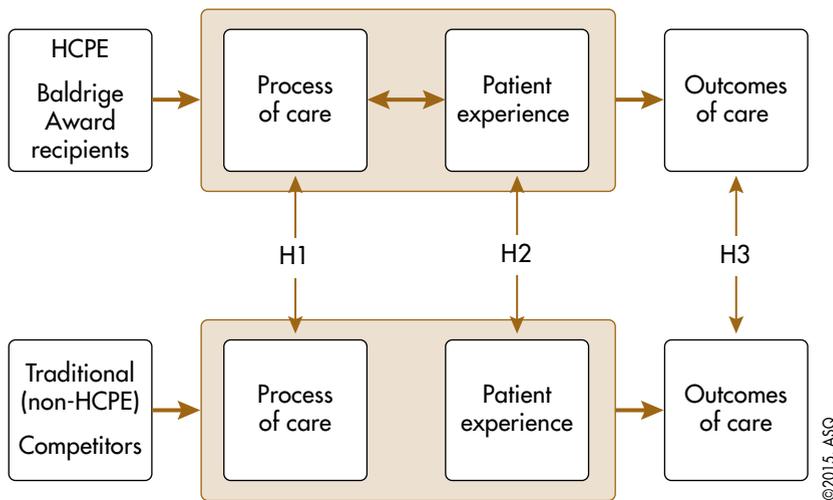
The CPE/HCPE constructs and their relationships have been analyzed and validated by several studies including Wilson and Collier (2000) and Flynn and Saladin (2001). Research on the CPE framework confirms the link between practices and results in the basic CPE framework (Evans and Jack 2003) and in the healthcare context (Goldstein and Schweikhart 2002). To validate the theoretical framework underlying the HCPE, Meyer and Collier (2001) tested the HCPE for the healthcare industry using data from 220 U.S. hospitals; the results of confirmatory structural equation modeling (SEM) showed that many of the hypothesized causal relationships in the HCPE framework were statistically significant, confirming the strong relationship between the processes (Categories 1 through 6) and results (Category 7). Goldstein and Schweikhart's (2002) research examined the relationships between the constructs in the HCPE framework and management systems and organizational results to establish the construct validity of the HCPE. In addition to the systems components, the core values and concepts

embedded in the HCPE that influence the culture of the organizations have been studied by Evans and Ford (1997) and again focused on healthcare by Belohlav (2010). More recently Lee, Lee, and Olson (2013) used SEM to study the HCPE framework in 254 hospitals in South Korea, finding evidence that indicates the seven categories of care and service processes are positively associated with each category of the HCPE framework in the healthcare industry.

HYPOTHESES

Traditional (non-HCPE) healthcare quality management frameworks such as the Donabedian framework have been so ingrained in the understanding of the process for evaluating the quality of medical care that the Agency for Healthcare Research and Quality (AHRQ) acknowledges its use for creating quality measures (AHRQ 2013). The traditional healthcare organization approach is focused on individual physical characteristics, equipment, qualified healthcare personnel, technology, and management, while the HCPE framework is based on a comprehensive, integrated, aligned, patient-centered system of care that is based on interrelated organizational systems. Although both the non-HCPE and HCPE frameworks contain many of the same organizational "components" for providing patient care, a difference in approaches affects the processes of care, especially those processes that influence the patient experience. The HCPE systems-perspective design enables the identification of the key leverage points that have the greatest impact on overall performance. Systems thinking and perspective were identified as key elements in the Leading Transformation to Performance Excellence (LTPE) framework (Latham 2013b). The HCPE provide leadership with a structure and mental model for understanding how to move an organization from good to excellent performance; the HCPE challenge leaders to learn to think at a different level and to move beyond silo or departmental linear thinking. The HCPE framework differs from the traditional

Figure 1 Theoretical framework



non-HCPE approach in that it adds a systems approach and a comprehensive scorecard that goes beyond individual excellence of the various clinics and providers in the hospital to excellence as the patient sees it—an integrated system from check-in to billing. While individual quality improvement efforts by healthcare providers are important, the evidence suggests that both quality practices and quality context are needed to improve overall hospital performance (Carter, Lonial, and Raju 2010).

Given the HCPE framework appears to address not only the clinical processes of care results but also the systems and culture that create the overall patient experience of care results and outcomes, the authors hypothesized that the scorecard of clinical results, patient experience results, and outcomes would be substantially better for hospitals and hospital systems that effectively used the HCPE framework to improve. The overall hypothesis was: Hospitals that have effectively used the HCPE as verified by the national Baldrige Award for Performance Excellence perform better than competing hospitals in their geographic markets (non-HCPE) based on comparisons of the same CMS performance measures. Three hypotheses were tested, one for each category of performance measures (see Figure 1).

The HCPE hospitals focus on both the individual pieces and parts of healthcare delivery using a variety of quality management and improvement methods and the overall system. The HCPE address the processes of care in Category 6, which addresses both the overall work systems and processes design, management, and improvement (NIST

2013). The HCPE guide organizations to design and develop their work processes to better serve the clinical results and outcomes as well as the patient experience expectations and preferences. While both HCPE and non-HCPE hospitals have implemented quality management and improvement methods, it is hypothesized that the additional benefits of a systems approach will result in HCPE hospitals performing better on process of care results versus their competitors.

- *H1: Process of care results for Baldrige Award recipient healthcare organizations are better than competing healthcare organizations in the same geographic area.*

Recent theories of customer loyalty date from the 1920s, and customer loyalty has been researched in other fields such as quality and operations management. In healthcare, research continues to confirm that patients choose hospitals on the basis of past experience, and “80% of consumers now go online for health information, and 58% of those say their search affected their health care decision making” (Forrester and Maute 2001, 259). There has been an effort over the past decade to learn from the hospitality industry what factors improve the patient and

family hospital experience to foster healing and drive customer decisions and perceptions of service quality (Wu, Robson, and Hollis 2013). Healthcare research has identified “patient-centered communication, reassurance, high-quality emotional and psychosocial care” as important attributes for medical practices’ developing sensitivity to patients’ needs, which was “a leading predictor of overall patient satisfaction and holds powerful influence over likelihood to recommend the practice” (Clark 2003, 119). Ultimately, customer loyalty is an important aspect of the profitability and sustainability of any organization. The hospitals using the HCPE have transformed their organizations from a narrow focus on clinical outcomes to a more holistic approach to quality in all respects, including the customer experience.

The HCPE also specifically address patient and stakeholder expectations and preferences in Category 3 customers including the voice of the customer and customer engagement. Category 3 addresses listening processes to capture past, present, and potential patient and stakeholder needs, wants, and desires. In addition, satisfaction and engagement are measured and compared with competitors. This information is used to inform the improvement of strategies and systems to better serve patients and stakeholders. Specifically, Category 3 addresses the approaches to identifying and developing healthcare offerings and engaging patients and stakeholders. Given this evidence-based focus on improving the patient and stakeholder experiences, it is hypothesized that HCPE hospitals perform better than their competitors on patient experience measures (HCAHPS).

- *H2: Patient experience results for Baldrige Award recipient healthcare organizations are better than competing healthcare organizations in the same geographic area.*

The HCPE address all process requirements, design, incorporation of new technology, organizational knowledge, and patient expectations in Category 6, Operations Focus. Outcome of care asks about an organization’s performance including clinical outcome in

addition to other key areas—healthcare and process results, customer-focused results, workforce-focused results, leadership and governance results, and financial and market results. The improvement of both process of care and patient experience are related to the outcomes (CMS 2011; 2012). If the HCPE process of care and patient experience results are better for HCPE hospitals, then the clinical outcomes related to those constructs should also be better than their competitors. Consequently, it is hypothesized that HCPE hospitals perform better than their competitors on clinical outcomes of care.

- *H3: Clinical outcomes of care results for Baldrige Award recipient healthcare organizations are better than competing healthcare organizations in the same geographic area.*

METHODOLOGY

To test these hypotheses the authors compared the results between Baldrige Award recipient hospitals and their competitors within a 50-mile radius. This study used a cross-sectional, observational, and retrospective design to test the hypotheses.

Sample

A purposive sampling strategy was used to select cases that met the specific inclusion and exclusion criteria for the independent variable and to focus on the specific hospitals in a geographic region rather than a general random sample (Shi 1997). The HCPE group consisted of the Baldrige Health Care Award recipients from 2002 through 2011. The comparison group consisted of competing hospitals within a 25- to 50-mile radius of the Baldrige Award hospital. The exclusion criteria were: 1) hospitals beyond the 25- or 50-mile radius; and 2) hospitals with no reported CMS data for the study period, such as Veterans Administration hospitals and children’s hospitals. The distance was based on patients’ access to a nearby hospital; nine hospital systems had competitors identified within a

Table 2 Characteristics of medium and large bed size HCPE and non-HCPE hospitals

Characteristic	HCPE (n=34)	non-HCPE Competitors (n=153)
Bed size		
Medium (100-400)	22 (64.7)	109 (71.2)
Large (401+)	12 (35.3)	44 (28.8)
Hospital type		
Acute care	33 (97.1)	150 (98)
Critical access	1 (2.9)	3 (2)
Ownership		
For profit	0	8 (5.2)
Nonprofit	34 (100)	145 (94.8)
Religious affiliation		
Yes	17 (50)	46 (30.1)
No	17 (50)	107 (69.9)
Emergency services		
Yes	34 (100)	140 (91.5)
No	0	13 (8.5)
Healthcare system		
Yes	29 (93.2)	88 (57.5)
No	5 (6.8)	65 (42.5)

Note: Data are given as frequency (percentage)

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25-mile radius search, and five hospital systems, in less populated areas, had competitors identified within a 50-mile radius search, and included facilities in multiple states. A total of 315 hospitals were initially considered for the study, with 51 HCPE and 264 non-HCPE or competitors. The characteristic of bed size was important in this study for managing missing data because a majority of the missing data were attributed to hospitals with fewer than 100 beds. In addition, the size of the hospital was found to moderate the relationship between quality practices and quality context and the overall hospital performance, with quality having a bigger impact on overall hospital performance for smaller hospitals (Carter, Lonial, and Raju 2010). Thus, three size categories were created to perform the analysis and clean the data: 1) “small” was fewer than 100 beds; 2) “medium” was 100 to 400 beds; and

3) “large” was more than 400 beds. This methodology was adopted from Jha et al. (2008). Table 2 identifies the hospital characteristics (control variables) that were included in the study. Hospitals with fewer than 100 beds were excluded from the study due to large amounts of missing data.

The exclusion of these cases reduced the number of subject hospitals from 315 to 187, with 34 HCPE and 153 non-HCPE hospitals. A search of the 153 non-HCPE hospitals websites revealed no evidence indicating the competitors were using the HCPE. The final sample size is comparable to the 175 sample used by Carter, Lonial, and Raju (2010) to compare programs among hospitals. Table 2 defines the hospital characteristics that the authors determined provided comparable HCPE and non-HCPE organizations suitable for this study.

Measurement

The dependent variables were specific to the particular hypothesis and all were standard CMS performance measures. A total of 23 process of care measures were used to test hypothesis 1 (see Table 3 for a complete list). A total of 10 HCAHPS hospital experience patient survey measures were used to test hypothesis 2 (see Table 4 for a complete list). A total of six outcome of care measures were used to test hypothesis 3 (see Table 5 for a complete list). The process of care (clinical and surgical) and HCAHPS hospital experience patient survey measures were refreshed in June 2011 and covered a collection period from October 2009 through September 2010. All process of care measures were ratio data and reported on patient rates. The HCAHPS hospital experience patient survey measures had three response formats: a) the patient gives a rating of “sometimes or never,” “usually,” and “always;” b) the patient indicates that a certain action or process occurred with a response of “yes” or “no;” and c) the patient gives a rating of 6 or lower, 7 to 8, and 9 and 10 on a scale of 0 to 10, with 0 being the lowest rating and

Table 3 Process of care: heart attack, heart failure, pneumonia, and surgical results

Measure ID	Heart attack measures	HCPE n=30-34	non-HCPE n=139-151	p-value
AMI-1	Aspirin at arrival	99.06 (1.63)	98.78 (2.30)	0.286
AMI-2	Aspirin prescribed at discharge	97.87 (7.17)	98.46 (2.99)	0.394
AMI-3	Given ACE inhibitor (ACE-I) or angiotensin receptor blockers (ARBs) for left ventricular systolic dysfunction	97.13 (4.40)	97.04 (6.14)	0.341
AMI-4	Adult smoking cessation advice/counseling	99.77 (1.28)	99.45 (1.69)	0.047
Measure ID	Heart failure measures	HCPE	non-HCPE	p-value
HF-2	Evaluation of left ventricular systolic function	99.22 (1.29)	98.76 (3.24)	0.410
HF-3	Given ACE inhibitor (ACE-I) or angiotensin receptor blockers (ARBs) for left ventricular systolic dysfunction	96.81 (3.29)	95.32 (6.23)	0.191
HF-1	Given discharge instructions	92.06 (7.56)	87.34 (13.6)	0.047
HF-4	Adult smoking cessation advice/counseling	99.94 (0.35)	98.62 (5.62)	0.020
Measure ID	Pneumonia measures	HCPE	non-HCPE	p-value
PN-5c	Patients given initial antibiotics within six hours after arrival	96.41 (2.94)	95.64 (4.91)	0.356
PN-3b	Patients receive initial ER blood culture prior to first antibiotics	96.63 (2.83)	96.79 (4.53)	0.301
PN-4	Patients given smoking cessation counseling	99.19 (1.97)	97.93 (5.21)	0.073
PN-6	Patients given most appropriate initial antibiotic	94.56 (3.98)	93.58 (5.53)	0.260
PN-7	Patients given influenza vaccination	93.41 (6.64)	91.83 (9.77)	0.361
PN-2	Percentage of patients given pneumococcal vaccination	n = 32 95.16 (6.34)	n = 151 94.34 (7.12)	0.248
Measure ID	Surgical measures	HCPE	non-HCPE	p-value
SCIP-Inf-1	Antibiotic given at right time, one hour before surgery	98.19 (1.33)	96.55 (6.73)	0.023
SCIP-Inf-3	Preventive antibiotics stopped at right time, within 24 hours after surgery	96.48 (2.11)	94.87 (6.76)	0.156
SCIP-Inf-2	Surgery patients given right kind of antibiotic	98.52 (1.02)	96.95 (4.57)	0.002
SCIP-VTE-2	Treatment within 24 hours to help prevent blood clots	95.19 (3.89)	93.17 (7.59)	0.105
SCIP-VTE-1	Surgery patients received treatment to prevent blood clots	96.54 (2.94)	94.89 (7.08)	0.253
SCIP-Inf-6	Patients needing hair removed from surgical area	99.81 (0.40)	99.67 (1.40)	0.044
SCIP-Inf-9	Patients' urinary catheters removed within the first or second day	91.68 (6.82)	88.59 (9.40)	0.023
SCIP-Card-2	Patients taking beta blockers were kept on them	96.06 (3.43)	93.10 (7.49)	0.016
SCIP-Inf-1	Outpatients given antibiotic one hour before surgery	94.26 (4.93)	91.91 (11.05)	0.138

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Note: Data are given as number (percentage) or mean +/- SD. Wilcoxon rank-sum test is use for continuous variables.

10 being the highest. This study included the positive or highest category score for the analysis, known as “top box.” HCAHPS results are “top-box,” “bottom-box,” and “middle-box” scores. The “top-box” was the most positive response to HCAHPS survey questions. In this study, only the HCAHPS “top-box”

methodology was used because it is commonly used in other healthcare research studies (Gupts 2009; Heidenreich et al. 2012; Jha et al. 2008). The outcome of care measures were refreshed in June 2011 and covered a collection period from July 2007 through June 2010. The outcome of care measures were

Table 4 HCAHPS hospital experience patient survey measures results

Measure ID	HCAHPS measures	HCPE n=32	non-HCPE n=153	p-value
H_COMP_1	Nurses always communicated well	79.03 (3.21)	74.64 (5.10)	0.000
H_COMP_2	Doctor always communicated well	80.00 (3.41)	78.36 (3.58)	0.025
H_COMP_3	Patients always received help as soon as desired	66.50 (5.45)	60.22 (6.21)	0.000
H_COMP_4	Patients' pain was always well controlled	71.97 (2.91)	68.03 (4.31)	0.000
H_COMP_5	Patients' staff always explained medicines	62.56 (3.92)	58.71 (5.13)	0.000
H_COMP_6	Patients were given information about recovery at home	84.56 (2.75)	81.79 (4.14)	0.000
H_CLEAN_HSP	Room and bathroom were always clean	73.34 (5.93)	67.87 (5.81)	0.000
H_QUIET_HSP	Room was always quiet at night	58.78 (7.47)	54.25 (6.82)	0.000
H_HSP_RATING	Hospital rating of 9 or 10	73.22 (6.44)	65.67 (7.80)	0.000
H_RECMMND	Patients would definitely recommend hospital	75.75 (7.28)	68.37 (8.78)	0.000

Note: Data are given as number (percentage) or mean +/- SD. Wilcoxon rank-sum test is used for continuous variables. Bonferroni correction $\alpha^* < 0.001$.

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Table 5 Outcome of care results

Measure ID	Outcome measures	HCPE n=29	non-HCPE n=153	p-value
Mort-30-AMI	Heart attack death rates (30-day mortality)	14.86 (1.52)	15.15 (1.47)	0.255
READM-30-AMI	Heart attack readmission rates	19.99 (1.75)	20.32 (1.30)	0.290
Mort-30-HF	Heart failure death rates (30-day mortality)	10.62 (1.78)	10.74 (1.60)	0.237
READM-30-HF	Heart failure readmission rates	25.20 (2.56)	25.44 (1.89)	0.367
Mort-30-PN	Pneumonia death rates (30-day mortality)	10.96 (1.41)	11.30 (1.61)	0.231
READM-30-PN	Pneumonia readmission rates	18.85 (1.81)	19.25 (1.61)	0.180

Note: Data are given as number (percentage) or mean +/- SD. Wilcoxon rank-sum test is used for continuous variables. Bonferroni correction $\alpha^* < 0.0083$.

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composed of the following six measures. Outcome of care measures were ratio data and reported as patient rates. For mortality and readmission rates, CMS provides estimates of confidence intervals (CI) of 30-day risk-adjusted outcomes. The estimates were weighted to account for variance differences between hospitals as follows:

$$30\text{-day mortality rate weight} = \frac{1}{(\text{standard error } 30\text{-day mortality rate})^2},$$

where the standard error of 30-day mortality rate = $(\text{upper CI} - \text{lower CI}) / (1.96 * 2)$

This methodology was used by Heidenreich et al. (2012) in their study of heart failure process of care and outcome of care for hospitalized Medicare patients.

Analysis

Prior to testing the hypotheses, a descriptive statistical analysis was performed including a test for normality. The CMS measure results were a non-normal distribution or nonparametric. The clinical process and the HCAHPS hospital experience patient survey measures values were skewed to the right in the 98 percent to 99 percent range. The outcome measures were skewed to the left in the 14 percent to 25 percent range. A common healthcare research approach is to use the Wilcoxon rank-sum nonparametric test for continuous variables to compare the two groups (Bilimoria et al. 2013; Heidenreich et al. 2012; and Safavi et al. 2013). The null hypothesis was $H_0: \mu_{\text{HCPE}} = \mu_{\text{non-HCPE}}$.

Likewise, the alternative hypothesis was $H_a: \mu \text{ HCPE} > \mu \text{ non-HCPE}$ or $H_a: \mu \text{ HCPE} < \mu \text{ non-HCPE}$, depending on whether the higher value of the outcome was favorable or unfavorable. For example, a higher HCAHPS hospital experience patient survey measures performance was favorable, while a lower outcome mortality rate was favorable. In particular, the effect of HCPE on the likelihood of a patient recommending the hospital, while accounting for organizational characteristics, was evaluated. To reduce the probability of Type I error, or the probability of false positives, the Bonferroni correction was used with an alpha value equal to 0.05 to evaluate all hypotheses (Rosner 2006).

FINDINGS

Of the 39 CMS measures in the three different CMS measure groups analyzed in the study, there was a statistically significant difference for 10 of 39 measures, including one clinical process measure for surgical care improvement project process measure (see Table 3) and nine HCAHPS patient experience survey measures (see Table 4). Although not all measures were statistically significant, Baldrige Award recipient hospitals had higher mean values representing higher performance than the non-Baldrige Award recipient hospitals in 37 of the 39 (95 percent) study measures. For most of the measures, there was little difference between the means values and little variation, and most of the values were at the extremes.

Hypothesis 1: Process of Care

The process of care hypothesis is divided into four groups including heart attack measures, heart failure measures, pneumonia measures, and surgical measures. The means for three of four heart attack measures were higher for HCPE hospitals compared to non-HCPE hospitals, but only one of the four measures was statistically significant at $\alpha < 0.05$; no measures were significant using the Bonferroni correction of $\alpha^* < 0.013$ (see Table 3). Process of care heart failure measures performance results for the four measures

of inpatient heart failure. Hospitals using the HCPE had higher mean values than the non-HCPE hospitals in all measures, and two of the four measures were statistically significant at $\alpha < 0.05$ but not statistically significant using the Bonferroni correction of $\alpha^* < 0.013$. Process of care pneumonia measures performance results for the six measures of inpatient pneumonia care. Although not statistically significant, hospitals using the HCPE have higher mean values than the non-HCPE hospitals in all measures except one, but none of the six measures were statistically significant at $\alpha < 0.05$ or with a Bonferroni correction of $\alpha^* < 0.008$. Process of care surgical measures performance results for the nine measures of inpatient surgical care. Although not statistically significant, hospitals using the HCPE had higher mean values than the non-HCPE hospitals in all nine measures; four of the nine measures were statistically significant at $\alpha < 0.05$, but only one was statistically significant with a Bonferroni correction at $\alpha^* < 0.006$. The one statistically significant measure was “surgery patients given right kind of antibiotic” (absolute difference, 1.57 percent). Consequently, the evidence does not support the hypothesis that process of care results for Baldrige Award recipient healthcare organizations are better than competitors in the same geographic area. Table 3 lists the process of care results for heart attack, heart failure, pneumonia, and surgical measures performance results.

Hypothesis 2: Patient Experience

All 10 HCAHPS hospital experience measures using the HCPE had higher means values and eight of the 10 measures had lower standard deviations than the non-HCPE hospitals (see Table 4). All differences were statistically significant at $\alpha < 0.05$, but after applying the Bonferroni correction of $\alpha^* < 0.001$, the HCAHPS hospital experience measures were significant except for “Doctor always communicated well.” As a group, these were the most significant findings in the

study. Overall, the evidence supports the hypothesis that HCPE healthcare organizations' performance is better in nine of 10 null hypotheses. The evidence supports the hypothesis that patient experience results for Baldrige Award recipient healthcare organizations are better than competitors in the same geographic area. Table 4 lists the performance results comparing Baldrige Award recipient hospitals to non-Baldrige Award recipient hospitals using the 10 CMS measures of patients' experience.

Hypothesis 3: Outcomes

Unlike all previous measures, for outcome measures, lower means are better. Although not statistically significant, hospitals using the HCPE all have lower mean values than the non-HCPE hospitals in six measures, but none of the measures were statistically significant ($\alpha^* < 0.05$) (see Table 5). Consequently, the evidence does not support the hypothesis that outcome of care results for Baldrige Award recipient healthcare organizations are better than competitors in the same geographic area. A complete list of outcome of care results are shown in Table 5.

DISCUSSION

The hypotheses focused on the process of care (H1) and outcomes of care (H3) were not supported (see Table 6). Unlike the patient experience performance measures (H2), these clinical and outcome process measures have been ingrained in healthcare education and medical practice for decades. Process of care and the associated outcomes are based on established and tested healthcare methods, such as identified by Donabedian (1981) norms and standards of quality. In addition, process of care quality is the “product of two

elements: a) the fundamental attributes of the science and technology of health care; and b) the ways in which the science and technology of health care are applied in practice” (Donabedian 1993, 32). Over the years, accreditation of hospitals through the Joint Commission has depended on achieving performance targets for clinical processes, which by nature are measures of individual functions, not complex interrelated system measurements. This historically clinical approach has proven to be effective for many to most hospitals and may be a reason there is not a statistically significant difference in process performance and clinical performance between hospitals using the HCPE and the non-HCPE hospitals. This raises questions regarding the benefits of a systems approach on the performance of core clinical processes. Possible explanations include the scientific nature of clinical processes identified previously, documented improvements and best practices widely shared among healthcare practitioners, and the many years of cycles of improvement of clinical processes for organizations using both traditional and HCPE healthcare approaches.

The patient experience hypothesis (H2) was supported. The HCAHPS patient survey measures results were the most significant findings in this study. Hospitals that used the HCPE had higher means and lower standard deviations than the non-HCPE hospitals in all 10 measures, and all differences were statistically significant except the HCAHPS hospital experience measure “Doctor always communicated well.” A recent study on patient experience indicated

Table 6 Summary of hypotheses results

Hypotheses	Number hypotheses tested	Significant with Bonferroni correction	Conclusions
H1: Process of care (See Table 3 for complete results)	23	1	Not supported
H2: Patient experience (See Table 4 for complete results)	10	9	Supported
H3: Outcome of care results (See Table 5 for complete results)	6	0	Not supported
Total	39	10	

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that “the heart of the patient experience lies in the organization’s ability to energize the unique employees, relationships, and services it offers and to purposefully shape a positive experience that delivers on the brand’s promise” (Needham 2012, 262). There has been ample research identifying the positive relationship between patient experience and employee satisfaction, engagement, and quality of care (Atkins, Marshall, and Javalgi 1996; Davis et al. 2000; DerGurahian 2009; Forrester and Maute 2001).

The patient experience is important for the future of healthcare. According to Berwick (2009, 555), the concept of “patient centeredness is a dimension of health care quality in its own right, not just because of its connection with other desired aims, like safety and effectiveness.” In addition, the concept of “patient centeredness” was a pivotal concept defined by the Institute of Medicine’s study as one of the “six aims and ten rules for health care redesign” (Institute of Medicine 2001, 2). The final survey prompt “Patients would definitely recommend the hospital” was perhaps the most critical performance measure in this study. This is a likelihood-to-recommend question that has proven to be important to the profitability and sustainability of organizations, including hospitals.

The study results show that Baldrige Award recipient hospitals were able to achieve clinical process and outcomes of care results equal to or better than competitors and at the same time achieve patient experience results better than their competitors (see Table 6). Improving performance across a comprehensive scorecard requires a systems approach that addresses the leverage points in the organizational systems versus making tradeoffs between the individual pieces and parts.

IMPLICATIONS FOR THEORY AND PRACTICE

The results support the HCPE as a comprehensive framework for improving healthcare performance as identified by the Institute for Health Care

Improvement (Reinertsen, Pugh, and Bisognano 2008). The HCPE provide a systems approach that evidence suggests is effective in ensuring the best clinical outcomes, and leaders have learned that applying the HCPE helps them focus, prioritize, integrate, and align their improvement initiatives to accomplish the results that matter most (Bodinson 2005). The HCPE framework is an open design that “encourages creativity and innovation” while enabling the HCPE to integrate key healthcare themes, such as the patient and stakeholder as key customers, complex leadership structures, and the multiple roles of healthcare providers, including physicians, staff members, suppliers, and customers (NIST 2013). The HCPE can have a significant impact on organizations pursuing performance excellence, particularly healthcare organizations. This study demonstrates that the use of the HCPE framework produced practical results of achieving higher performance levels.

The major implication of this study is how hospitals in this study using the HCPE have performed significantly better at managing the patient experience than their competitors. This is important in and of itself, but it also has a positive effect on the hospital’s financial performance. The ACA has changed the Medicare program’s history as a payer for healthcare services, evolving from the reimbursement of providers based on reasonable costs to a prospective payment system, to a payment system that will vary based on the quality of the care provided (Shoemaker 2011). The final measure in the HCAHPS patient experience survey, “Patients would definitely recommend the hospital,” is a likelihood-to-recommend question that has been linked to repeat and referral business and, in turn, financial performance (Reichheld and Markey 2011). Of patients treated at an HCPE hospital in the study, 75.75 percent would recommend the hospital, versus 68.37 percent for the non-HCPE hospitals ($p < 0.000$). Since 2001, Reichheld has researched this likelihood-to-recommend question to identify those who would not recommend (“detractors”) and those who would strengthen the organization image and reputation

through positive word of mouth (“promoters”), thus generating profitability and sustainable growth (Reichheld and Markey 2011).

The HCPE are an effective framework for transforming an organization to address the ACA and CMS change to healthcare. However, at least 70 percent of all initiatives fail despite leaders’ best efforts (Beer and Nohria 2000). This study provides information that leaders can incorporate to increase the odds of success when planning the implementation of new policy and resulting strategies within a workplace culture of performance. While an HCPE transformation is not an easy task, it is possible with the leadership system, style, and individual leadership characteristics identified in previous research on CEOs who led successful transformations resulting in recognition as Baldrige Award recipients (Latham 2013a; 2013b). The results of this study help validate the effectiveness of the HCPE as a framework to achieve performance excellence and meet the continuously increasing stakeholder requirements related to value. The HCPE framework offers leaders a systematic holistic framework for hospital performance improvement that presents questions as to how business systems interrelate, adapt, learn, and improve.

LIMITATIONS

The main limitations of this study include the sample, the lack of a sizable mean difference between the clinical process and outcome measures, the performance results with extreme values posed limitations, and the limited scope of measures included. Of the number of limitations in this study, the most important is sample size. Due to the limited number of Baldrige Award recipients and to help reduce variation and control for factors outside this study, a purposive sample was selected to compare the HCPE hospitals with those located nearest to them. There are a fixed number of Baldrige Award recipients, and selection of the comparison group was based on geography. Due to missing data, small

hospitals were excluded, which may limit the generalizability of the findings to hospitals with more than 100 beds. The difference in clinical process of care and outcome performance among healthcare organizations was limited, with many at a very high level of performance (98 to 100 percent). This may have impacted the ability to differentiate between HCPE and non-HCPE performance for the two unsupported hypotheses. Finally, this study was limited to three of five categories of value-based purchasing measures (see Table 1). While the three categories used are key to overall organization success, they provide an incomplete picture of overall performance. As with most organizational studies, “the most important figures needed for management of any organization are unknown and unknowable” (Deming 1986, 121).

Recommendations for Future Research

As the number of Baldrige recipients continues to increase, future studies will be able to increase the sample size. As the measures become available for other dimensions of value-based purchasing (see Table 1), they should be included to provide additional insights into the usefulness of HCPE. Future studies should also consider longitudinal data collection and analysis to establish the change in performance as the HCPE are used to improve the organization. Studies that include more organizations and study the change in performance over time of a more comprehensive scorecard will provide needed insights into the overall and longer-term impact of the HCPE.

Future research of employer and employee relationships is important to improving healthcare and in particular the patient experience. Consideration should be given to studies of the hospital workforce and their impact on the process, outcomes, and patient experience. Employers find that dedicated employees stay with their organizations, resulting in a reduction of turnover costs, and dedicated employees fare better in comparison for clinical outcomes, increasing patient

safety, improving the patient experience, and reducing potential risk and loss (Press Ganey 2012). In addition, there is a need for studies of hospital organizational cultures and design relative to organizational performance. Finally, the design and complexity of the HCPE criteria are a challenge. Learning and using the HCPE requires years of study and practice and requires: a) learning new mental models that challenge the management practices of the past; b) adopting a philosophy of continual learning and improvement; and c) creating a culture that fosters high performance, reliability, and sustainability.

CONCLUSION

This study compares performance results of 34 Baldrige Award recipient hospitals to 153 non-Baldrige Award recipient hospitals in their geographic markets. Baldrige Award recipient healthcare organizations, process of care and outcomes of care results were as good as or better than competitors in the same geographic area. At the same time, Baldrige Award recipients achieved better patient experience results than competitors in the same geographic area. These results combined with previous research provide leadership with evidence that the HCPE serve as a valid framework to create both clinical process of care results and outcomes along with quality patient experiences. They provide further evidence supporting the claim that healthcare systems using the HCPE have achieved and sustained the highest national levels of patient safety and patient loyalty; healthcare outcomes; physician, nurse, and staff satisfaction and engagement; revenue and market share; and community services (NIST 2010).

One practical implication of this study is revealing how hospitals using the HCPE have performed significantly better at creating patient experiences than their competitors. This is important in a practical sense because the difference has an effect on the financial performance of acute care hospitals. The ACA created the CMS value-based purchasing program to shift

Medicare toward integration and alignment between payment and quality. The value-based purchasing strategies were designed to reward hospitals financially for providing higher quality care, transform total care delivery, and increase the level of shared accountability among providers (Miltenberger, Downs, and Greene 2012). In addition, patient experience influences patient loyalty, repeat and referral business, and in turn financial performance (Reichheld 2001).

A mean value of 75.75 percent of patients treated at HCPE hospitals would recommend the hospital versus 68.37 percent of the non-HCPE hospitals $p < 0.000$. Ultimately, customer loyalty is important for the profitability and sustainability of any organization. The hospitals effectively using the HCPE produce better patient experiences while at the same time maintaining comparable process of care and clinical outcome results.

The HCPE offer a systematic, valid, and reliable framework that has undergone decades of development, implementation, and testing by thousands of organizations in various industries. This study identifies that organizations pursuing performance excellence, especially in healthcare, have an overall business framework for leaders to use in their efforts to improve the healthcare system. The evidence suggests that the HCPE are an effective framework for adapting, improving, and aligning healthcare organizations to meet increasing pressure from multiple stakeholders and the new healthcare value-based paradigm created by the ACA. This new paradigm requires healthcare organizations to develop strategies for achieving high value for patients. Finally, the ACA is redesigning healthcare, and leadership engagement in the transformation of their healthcare organizations will improve the likelihood of success. Healthcare organizations will experience a comprehensive transformation over the next 10 years. The HCPE provides leadership with a framework for aligning organizational design, strategy, systems, and human capital to create long-term effectiveness in a high-performance culture.

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