# Tapping Into Patient Engagement in Organizational Performance Improvement: A Social Resource-Based View and the Role of Patient and Family Engagement

Jinyoung Cha[1], Jaeyoung Jang[2], and Keon-Hyung Lee[1]

[1]Florida State University Askew School of Public Administration and Policy
[2]UNC Charlotte College of Health and Human Services

August 24, 2024

**Abstract**

Over the past two decades, patient-centered care has gained global prominence, emphasizing collaboration among patients, families, caregivers, and healthcare professionals to improve healthcare delivery. Recognizing the foundational role of patient participation in enhancing clinical outcomes, healthcare organizations increasingly integrate patient inputs and resources into their management strategies. Patient and Family Advisory Councils (PFACs) represent a primary form of collective patient engagement at the organizational level. PFACs actively engage in all levels of the hospital system to enhance quality improvement and meet the demands of patients. Despite PFACs' recognized importance, empirical evidence regarding their roles as strategic resources and impact on hospital performance remains unexplored. Incorporating patient engagement into SRBV, this study addresses how comprehensive strategic resources are associated with a hospital's quality of care and patient satisfaction outcomes. Utilizing hospital-level data from 2018 to 2020, a cross-sectional time-series ordered logit analysis examines the quality of care and satisfaction models. The findings reveal that patient engagement, physical resources, and human capital are positively associated with hospital quality of care and patient satisfaction. In contrast, a social resource – a minority population – is negatively associated with hospital outcomes. This study contributes theoretical and practical implications. It synthesizes patient engagement into the SRBV approach and provides consistent empirical evidence. In addition, it suggests evidence for practitioners to develop and manage patient engagement as a strategic resource.

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Jinyoung Cha

Ph.D. Candidate

Askew School of Public Administration and Policy

Florida State University

Tallahassee, FL.

Jaeyoung Jang, Ph.D.

Assistant Professor

Department of Health Management and Policy

College of Health and Human Services

University of North Carolina Charlotte

Charlotte, NC.

Keon-Hyung Lee, Ph.D., M.P.H. ***

Arnold L. & Priscilla Moss Greenfield Endowed Professor

Askew School of Public Administration and Policy

Florida State University

Tallahassee, FL.

klee2@fsu.edu

*** Corresponding Author: Keon-Hyung Lee

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Over the past two decades, patient-centered care has gained global prominence, emphasizing collaboration among patients, families, caregivers, and healthcare professionals to improve healthcare delivery. Recognizing the foundational role of patient participation in enhancing clinical outcomes, healthcare organizations increasingly integrate patient inputs and resources into their management strategies. Patient and Family Advisory Councils (PFACs) represent a primary form of collective patient engagement at the organizational level. PFACs actively engage in all levels of the hospital system to enhance quality improvement and meet the demands of patients.

Despite PFACs' recognized importance, empirical evidence regarding their roles as strategic resources and impact on hospital performance remains unexplored. Incorporating patient engagement into SRBV, this study addresses how comprehensive strategic resources are associated with a hospital's quality of care and patient satisfaction outcomes. Utilizing hospital-level data from 2018 to 2020, a cross-sectional time-series ordered logit analysis examines the quality of care and satisfaction models. The findings reveal that patient engagement, physical resources, and human capital are positively associated with hospital quality of care and patient satisfaction. In contrast, a social resource – a minority population – is negatively associated with hospital outcomes. This study contributes theoretical and practical implications. It synthesizes patient engagement into the SRBV approach and provides consistent empirical evidence. In addition, it suggests evidence for practitioners to develop and manage patient engagement as a strategic resource.

Keywords: Patient and Family Advisory Council, Social Resource-Based View, Hospital Performance

## I. Introduction

Patient-centered care has become prevalent in healthcare systems as part of a broader global movement over the past two decades (Dukhanin et al., 2019). Patient engagement entails the active collaboration between patients, families, caregivers, and healthcare professionals to enhance healthcare delivery at individual, organizational, and policy levels (Sharma et al., 2018). Since the growing consensus is that patient participation is foundational to improving patient experience and clinical outcomes (Herrin et al., 2015; Jarrar et al., 2019), healthcare organizations strive to integrate patient inputs and resources into their management to enhance patient-centered care delivery (Forward & Sieck, 2022; Snow, 2022). Given the prominence of patient and family-centered care, they have been empowered to play more active, informed, and influential roles in healthcare service provision (Carman et al., 2013).

One primary form of collective patient engagement in an organization is the Patient and Family Advisory Councils (PFACs). Through healthcare reform and programs, PFACs have been established in the hospitals. Federally Qualified Health Centers (FQHCs), Accountable Care Organizations (ACOs), and Medicare's Comprehensive Primary Care Plus (CPC+) require the establishment of PFACs as a prerequisite for participation (Sharma et al., 2018; Dukhanin et al., 2019). Furthermore, in 2008, Massachusetts enacted a

mandate requiring that every hospital institute PFACs and disclose their operational activities. PFAC is widely defined as "a group of patients, families, caregivers, and other consumers and citizens, and health professionals working in active partnership at various levels across the health care system, such as direct care, organizational design and governance, and policymaking" (Carman et al., 2013, p. 224). PFAC advisors share their perspectives and provide inputs on hospital policies and programs; serve as a resource to providers and promote relationships between staff, patients, and family members (Forward & Sieck, 2022).

In this regard, PFACs have contributed a variety of inputs and resources to hospitals, equipping them with strategic assets and thus enabling them to attain organizational sustainability. However, there has been limited attention to the relationship between the role of PFACs as strategic resources and hospital performance in two aspects. First, the Resource-Based View (RBV) or extended Social Resource-Based View (SRBV) focuses on both tangible and intangible resources, including financial and physical resources, human capital, organizational culture, reputation, inter-organizational relationship, social and natural capabilities (Barney, 1991; Kraatz et al., 2001; Short et al., 2002; Upadhyay et al., 2020; Lee et al., 2023). Despite its applicability within the healthcare domain, a lack of empirical evidence has been explored (Koisol et al., 2023). Moreover, they did not shed light on how a PFAC can provide unique resources and improve organizational performance through the comprehensive lens of the SRBV framework.

On the other hand, the previous literature on PFACs has acknowledged the positive impact of PFACs on hospital performance. However, empirical evidence remained unclear despite their conceptual recognition of PFACs' role. One study criticized that while participants felt heard and valued, their impacts on outcomes were limited (Fredriksson & Modigh, 2021). In addition, most studies tend to focus on qualitative and descriptive approaches, using systematic reviews or case studies (Peikes et al., 2016; Sharma et al., 2017; Oldfield et al., 2018; Taff et al., 2018; Fredriksson & Modigh, 2021).

To fill this gap, this study examines the role of PFACs as strategic resources on hospital performance, applying the comprehensive framework of the Social Resource-Based View. Integrating the Social Resource-Based View with patient engagement, this study analyzes the relationship between financial, physical, human, and social resources, alongside patient engagement resources (PFACs), and their impact on hospital quality of care and patient satisfaction.

## II. Theoretical Framework and Hypotheses

### 1. The Social Resource-Based View (SRBV)

The Resource-Based View (RBV) contends that a firm's competitive advantage lies in effectively leveraging valuable, rare, and difficult-to-imitate resources (Barney, 1991; Lado et al., 1992; Tate & Balls, 2018). Organizations carve out unique market positions by strategically developing these resources. Under a organization's control, resources are tactically utilized to generate competitiveness and achieve organizational goals and missions (Barney & Clark, 2007). Researchers have attempted to categorize resources, such as tangible, intangible, and capabilities (Barney, 1991; Yarbrough & Power, 2006). Tangible resources are property-based, including physical, financial, and capital assets (Yarbrough & Power, 2006). Intangible resources include an organization's knowledge, intellectual property, relationships, leadership, and reputation (Smith, 2008). Capabilities refer to an organization's ability to coordinate resources to accomplish its goals, such as culture, teamwork, and trust (Yarbrough & Power, 2006). Thus, performance is a function of obtaining and deploying these unique assets to create organizational sustainability (Short et al., 2002). However, the RBV overlooks the dynamic evolution of social and environmental conditions, forcing organizations to broaden their skill sets and adjust their tactics to remain adaptable (Lee et al., 2023).

Beyond this gap, the Social Resource-Based View (SRBV) proposes that social, environmental, or institutional elements can limit organizations from obtaining the necessary resources and capabilities to accomplish sustainable advantages (Hart, 1995; Tate & Bals, 2018). The SRBV highlights the importance of organizations considering social and institutional factors to navigate these external dynamics and enhance economic and social values. This strategic approach can lead to a positive impact on their long-term performance and organizational sustainability. SRBV is relevant to understanding a hospital's performance improvement

since social and institutional conditions surround healthcare organizations. Implementing the logic of a resource-based view in challenging and turbulent healthcare environments appears to be a legitimate strategy (Burton & Rycroft-Malone, 2015; Ferlie et al., 2015; Kosiol et al., 2023). Therefore, this study draws on the SRBV as a theoretical lens to investigate how organizational and social resources are associated with hospital performance improvement.

Furthermore, this study identifies patient engagement through PFACs as a strategic resource, incorporating the SRBV framework. The extended Resource-Based Approach presents an avenue to examine how diverse stakeholders, notably patients, contribute to creating valuable knowledge assets for hospitals. Although current conceptualizations of evidence pay attention to patient feedback, the personal and collective wisdom that emerges from knowledge or experience constructions via patients over time can provide a knowledge resource that is generally not collated (Burton & Rycroft-Malone, 2015). Thus, this study focuses on how the PFACs can be pivotal in determining hospital performance, offering hospitals critical resources to gain organizational sustainability.

**1) Financial & Physical Resources**

Financial and physical resources have been considered significant in developing organizational performance (Bourgeois, 1981; Barney, 1991; Kraatz et al., 2001; Short et al., 2002). Financial and physical resources bolster organizational sustainability, allowing them to respond effectively and competitively (Short et al., 2002). These financial and physical slacks can improve organizational outcomes, including HRM, conflict resolution, better workflow, and creative and innovative strategies (Bourgeois, 1981). They can foster organizational innovations as they allow for experimentation, such as launching new products, entering new markets, and offering new services. Previous studies have acknowledged that financial and physical resources positively affect organizational performance (Barney, 1991; Short et al., 2002). They enable hospitals to invest in medical equipment, innovative technology, and modern facilities in the healthcare sector. It can directly impact patient care by facilitating timely diagnoses, more effective treatments, and enhanced patient comfort during their stay.

H1-1: Hospitals with greater financial and physical resources are more likely to provide better quality of care.

H1-2: Hospitals with greater financial and physical resources are more likely to lead to higher patient satisfaction.

**2) Human Resources**

With the advent of the knowledge economy, strategic resources, such as human capital, have emerged as the primary source of competitive advantage for organizations (Su et al., 2009). It highlights that employees at every organizational level constitute the resources for an organization's competitive advantage (Chan et al., 2004). Human resources can possess the training, experience, judgment, intelligence, relationships, and insight of individual managers and workers in an organization (Barney, 1991). Moreover, human resources encompass practical know-how, competencies, educational background, and individual psychometric assessments (Su et al., 2009). With the availability of this skilled labor, organizations find it more feasible to harness the labor pool for enhanced performance (Teodoro & Switzer, 2016). Therefore, recognized as a strategic asset, human resources can play a pivotal role in fostering organizational competitiveness and success (Barney, 1991; Su et al., 2009).

Specifically, in the highly professionalized healthcare sector, the role of human resources has become more significant in improving organizational performance. Skilled and motivated healthcare professionals, including physicians, nurses, and support staff, are essential for delivering high-quality care. Moreover, their efforts contribute to a positive patient experience, fostering satisfaction and trust in the healthcare institution. Prior studies provided empirical evidence that human resources improve hospital outcomes (Lang et al., 2004; Bartel et al., 2014). Thus, we hypothesize that hospitals with greater human resources are positively associated with quality of care and patient satisfaction.

H2-1: Hospitals with greater human resources are more likely to provide better quality of care.

H2-2: Hospitals with greater human resources are more likely to lead to higher patient satisfaction.

**3) Social and Institutional Resources**

Identifying the significant role of social and institutional factors, we draw a hypothesis to examine whether social or institutional factors can affect organizational performance in the healthcare sector. A community characteristic, such as racial composition, reflects the distribution of available resources and the task environment the organization serves, directly impacting its performance (Pendeya & Oyama, 2019).

In the healthcare sector, this tendency has become more apparent. The socioeconomic conditions of a community determine the demand for healthcare services and are likely to affect the performance of hospitals. Community segregation is a primary cause of racial differences in Socioeconomic Status (SES), and it remains a fundamental cause of a racial gap in health (Williams & Collins, 2001). The literature suggests that minorities exhibit lower levels of trust in their physicians compared to Whites, are more inclined to seek care from providers of lower quality, and demonstrate lower health literacy. In addition, their neighborhoods often lack resources, including diminished social capital and higher incidences of substance abuse, smoking, or violence (Chen et al., 2017). These racial compositions in a community directly affect their health status and needs, increasing a hospital's uncertainty in managing their outcomes.

Similarly, hospitals in communities with lower income, lower educational attainment, and higher minority populations showed lower quality of care (Shi et al., 2020). Therefore, previous studies acknowledged the impact of racial composition as a critical social attribute that determines the performance of hospital and community health outcomes (Williams & Collins, 2001; Chen et al., 2017; Shi et al., 2020; Golestaneh et al., 2021). This study hypothesizes that hospitals in a county with higher non-white populations are negatively associated with their quality of care and patient satisfaction.

H3-1: Hospitals located in a county with higher non-white populations are less likely to provide better quality of care.

H3-2: Hospitals located in a county with higher non-white populations are less likely to lead to higher patient satisfaction.

**2. Patient Engagement as Competitive Advantage**

The Utilization of patient and family engagement is a largely untapped resource, offering opportunities to enhance patient-centered care and confer organizational advantages and sustainability upon hospitals (Burton & Rycroft-Malone, 2015; Kuhn et al., 2016). In addition to internal resources, certain RBV studies have broadened their focus to encompass how to complement resources that organizations may lack. Drawing from the resource-dependence theory, some highlight the significance of inter-organizational relationships and networks, enabling organizations to secure unique resources through collaboration (Yarbrough & Powers, 2006; Gloede et al., 2013). However, the relationship between hospitals and patient engagement has remained unexplored.

Patient and family engagement, facilitated through PFACs, can contribute to providing values, knowledge, expertise, experience, creativity, and community needs to all levels of hospital management (Peikes et al., 2016; Sharma et al., 2017; Mahdavi et al., 2021). Co-production theory explains that participation can occur in multiple stages, including co-commissioning, co-designing, co-delivery, and co-assessment (Nabatchi et al., 2017). PFACs can provide various resources to hospitals through planning, designing, implementing, and evaluation as one form of collective co-production. For instance, PFACs can be pivotal in strategic planning and decision-making, quality improvement, staff hiring and education, developing a patient-centered culture, facility design, or improving health service design, delivery, and evaluation (Dukhanin et al., 2019). PFACs function to establish collaborative partnerships between patients and healthcare professionals, providing valuable insights into care processes and enabling the development of tailored programs and services aligned with community needs (Kuhn et al., 2016; Snow, 2022).

In this regard, PFACs can be considered a noteworthy asset for improving organizational performance. As resources are valuable, rare, and difficult to imitate (Barney, 1991), PFACs are a useful tool for healthcare practices in improving the quality of care and addressing the patient care experience, offering invaluable insights and resources regarding various processes within the system, and providing real-time feedback (Johnson et al., 2008; Peikes et al., 2016). Moreover, as patient feedback and participation in decision-making allow organizations to have critical information on patient demands, it can develop a priority setting aligned with patient-centered care and improved organizational performance (Sharma et al., 2017). Thus, by leveraging patients' broad engagement, hospitals can often cultivate innovative practices, processes, systems, and organizational cultures, meeting the health services demands and distinguishing them from competitors.

Prior studies have acknowledged this positive role of PFACs on organizational performance (Johnson et al., 2008; Johnson et al., 2016; Peikes et al., 2016; Sharma et al., 2017; Taff et al., 2018; Jarrar et al., 2019; Oldfield et al., 2019; Fredrickson & Modigh, 2021). Seminal systematic reviews examining the impact of patient engagement and its outcomes have outlined its influence on various organizational outcomes. These encompass clinical quality outcomes – clinical care outcomes, patient safety, and satisfaction – and extend to organizational innovation, including design and policymaking (Sharma et al., 2017; Oldfield et al., 2019). For instance, in the case of the Hospital of the University of Pennsylvania (HUP), implementing a PFAC creates innovative avenues for hospitals to bring in new expertise to improve the quality of care and create a better patient experience (Cunningham, 2016). PFACs have yielded information on patient falls, nurse communication, facility design, and patient billing inputs. Regarding the quality of care, PFACs embraced quality improvement efforts, such as convening small-group discussions with nurses, evaluating educational materials, offering the patient perspective, and providing guidance on practical approaches to disseminating information to patients. Professionals recognized that interactions with PFAC members and their interventions significantly reduced the fall rate per 1,000 patient days from 3.03 in 2011 to 2.18 in 2016.

Furthermore, regarding patient satisfaction, PFACs worked to develop and implement patient-centered nurse reports. They contributed to their HCAHPS "communication with Nurses" domain scores, rising from 76.9 in 2011 to 84.4 in 2016 (Cunningham, 2016). Therefore, this study sheds light on the positive role of PFACs in hospital performance, offering various strategic resources that empower hospitals to gain a competitive advantage. Focusing on the quality of care and patient satisfaction, which are core dimensions for patient-centered care, this study hypothesizes that hospitals with a Patient and Family Advisory Council are positively associated with their quality of care and patient satisfaction.

H4-1: Hospitals with a patient and family advisory council are more likely to provide better quality of care.

H4-2: Hospitals with a patient and family advisory council are more likely to lead to higher patient satisfaction.

## III. Data and Method

### 1. Data and Method

1) Data and Measures

This study employs quality of care and patient satisfaction as organizational performance. To measure each hospital's overall quality of care, we adopt the Overall Quality Star Rating provided by the Center for Medicare & Medicaid Services (CMS) each year. The score is calculated as a weighted average for five sub-measure groups: mortality, safety, readmission, patient experience, and timely and effective care. The rating spans from 1 star to 5 stars. The level of patient satisfaction with a hospital is measured by an overall star rating from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey, which is also provided by the CMS every year. This survey offers scores of 29 items to assess the patient experience of each hospital. We measure patient satisfaction with an overall rating of 1 to 5 stars.

Patient engagement is measured as an indicator variable, taking a value of one if a hospital has an established patient and family advisory council (PFAC) and taking a value of zero otherwise. The data comes from the American Hospital Association (AHA) Annual Hospital Survey. Hospitals' physical and financial resources

are measured as the logged values of the total fixed assets and the logged values of the net patient revenues, respectively (Barney, 1991; Short et al., 2002). Data used for both measures are from the RAND Hospital Data. Human resources are measured as the number of full-time equivalent (FTE) physicians, dentists, and FTE registered nurses (Su et al., 2009; Lee et al., 2023). Both variables are normalized using the total number of beds in each hospital, and the data are from the AHA survey. To measure the social and institutional resources, we adopted a percentage of the non-white population in each county. By adopting this measure, we can capture the level of social input from the minority population to the hospitals.

Our analyses also use multiple hospital- and county-level variables to control heterogeneity. Table 1 shows the measures of each variable and the data sources. Hospital size is measured as the number of beds in each hospital. Whether a hospital is a major or minor teaching affiliation organization, the shares of patients covered by Medicaid or Medicare programs and the Case Mix Index (CMI) are controlled. Regarding county-level differences, we measure the community demand for financial assistance with healthcare services as the logged value of the unreimbursed and uncompensated care costs. We also include the total population, percentage of individuals older than 65, income level, and uninsured rate in each county. The population and income data are from the U.S. Census and the U.S. Bureau of Economic Analysis, respectively.

Table 1. Variables and Measure

| Variable | M |
|---|---|
| Dependent Variables | Q<br>P |
| Independent Variables | P<br>P<br>F<br>H |
| Control Variables | S<br>H<br>T<br>M<br>M<br>C<br>C<br>T<br>P<br>P<br>U |

Note: All variables measured in dollar amounts are converted to 2018 real value using the Consumer Price Index (CPI)

Table 2 shows the descriptive statistics of variables used in the analysis. Our empirical analyses utilize individual hospital-level data from 2018 to 2020 in the U.S. The final dataset includes 3,477 observations, and 78% of them are non-profit hospitals. Both hospital quality of care and patient satisfaction are measured on a 5-point scale, and the average points of the performance measures are 3.16 and 3.08, respectively. In our sample, about 68% hold PFACs and practice patient engagement. The average level of physical resources in the hospitals is about $110.7 million, and the level of financial resources is about $833.4 million. Our analysis uses the physical and financial resources as the logged value. The sample hospitals have an average of 0.28 physicians and dentists per bed and 2.11 registered nurses per bed. The social and institutional resources are measured as a percentage of the minority or non-white population in the county where each hospital is located. Counties in our sample have an average of 22% minority population.

Regarding other hospital characteristics, sample hospitals have 182 beds on average, and 52% are in a

minor or major teaching affiliation status in the sample period. The hospitals have 33% and 10% of patient discharges covered by Medicare and Medicaid programs. The community demand for financial assistance from each hospital is measured by the hospital's unreimbursed and uncompensated care costs, and the average value is about $14 million. The sample average CMI index is 1.69. Among the community-level control variables, the total population in each county is about 256.6 thousand people on average, and about 17% of the population is over 65 years old. The average per capita personal income level is $51.8 thousand. The sample counties have an average uninsured rate of 10%. Our analysis uses community demand for hospital financial assistance, total population, and personal income as logged values. All variables measured in dollar amounts are converted to 2018 real value using the Consumer Price Index (CPI) from the Bureau of Labor Statistics (BLS).

Table 2. Descriptive Statistics

| Variable | C |
|---|---|
| Quality of Care | 3 |
| Patient Satisfaction | 3 |
| Patient Engagement | 3 |
| Physical resource (logged) | 3 |
| Financial Resource (logged) | 3 |
| Human Resource: Physicians and Dentists per Bed | 3 |
| Human Resource: Registered Nurses per Bed | 3 |
| Ownership: Governments | 3 |
| Ownership: For-profit | 3 |
| Ownership: Non-profit | 3 |
| Social and Institutional Resource (Minority Population, %) | 3 |
| Hospital Size (logged) | 3 |
| Teaching Hospital | 3 |
| Medicare Discharge (%) | 3 |
| Medicaid Discharge (%) | 3 |
| Community Demand for Financial Assistance (logged) | 3 |
| CMI Index | 3 |
| Total population (logged) | 3 |
| Population over 65 Years Old (%) | 3 |
| Personal income (logged) | 3 |
| Uninsured Rate | 3 |
| Note: All variables measured in dollar amounts are converted to 2018 real value using the Consumer Price Index (CPI). | |

2) Analytic Strategy

To test the hypotheses suggested in the previous section, we establish an empirical model as an ordered logistic regression model. This empirical model is useful in investigating the statistical association between predictors and outcomes measured in ordinal variables. By utilizing this model, for example, we can predict whether a hospital with citizen engagement as its resources would be more likely to perform better. The dependent variables used are the overall quality of care and patient satisfaction. The independent or predictor variables are physical, financial, human, and social resources. We also include patient engagement as an essential predictor of hospital performance.

The main models of our empirical analysis have each of those two performance measures as dependent variables. First, we estimate the models using all samples. Second, we conduct sub-sample analyses to investigate whether the roles of each resource differ across groups with and without patient engagement.

## IV. Findings

## 1. Main Findings

We estimate our primary empirical model to see the impact of resources on the probability of having better hospital performance. The estimation results are provided in Table 3. The first two columns show the results for the model using the overall hospital quality of care as the dependent variable. Given beta coefficients and odd ratios on each variable, patient engagement is positively associated with hospitals' overall quality of care. Hospitals that have established PFAC have 30.9% greater odds of having better quality. In addition to patient engagement, other resources have statistically significant impacts on hospital quality. Although financial resources would not play an important role, hospitals with more physical resources perform better in quality care. Human resources would also be critical to increasing the quality. Having one more physician per bed will give the hospital 47.2% greater odds of having a higher score on the quality of care. Adding one more nurse per bed will significantly improve the quality by having 33.4% greater odds. On the contrary, a hospital with a higher minority population share in their community would be more likely to have a lower quality score. In sum, we found that physical, human, social, and institutional resources would be critical predictors of overall hospital quality of care, and patient engagement would be a pivotal resource to increase the quality of care.

The columns (3) and (4) in Table 3 show the estimation results for predicting patient satisfaction. The results indicate that resource inputs are also critical to improving patient satisfaction. Hospitals with patient engagement have 49.4% greater odds of better patient satisfaction than those without patient input. Physical resources are also a critical factor in increasing the hospital's performance, and the impact of having a greater minority population share is also statistically significant. Unlike the results for hospital quality, however, only the number of physicians and dentists per bed is found to be a significant predictor of patient satisfaction. Overall, we found similar empirical findings for both performance measures, confirming all the hypotheses suggested in the previous section. The physical and financial resources results support H1-1 and H1-2, which are about their role in improving the quality of care and patient satisfaction. Findings on the significance of human resources on hospital performance confirm H2-1 and H2-2. Also, the findings about the minority population in the community support H3-1 and H3-2. One of the key findings of this study is that patient engagement is an essential resource for hospitals. We found that having PFAC would give a hospital a better chance of providing quality care and increase patient satisfaction, confirming our last two hypotheses, H4-1 and H4-2.

Table 3. Main Results

| VARIABLES | Qua |
|---|---|
| | (1) |
| | Beta |
| Patient Engagement | **0.26** |
| | (0.1 |
| Physical Resource | **0.37** |
| | (0.1 |
| Financial Resource | 0.18 |
| | (0.1 |
| Human Resource_ Physicians and Dentists per Bed | **0.38** |
| | (0.2 |
| Human Resource_ Registered Nurses per Bed | **0.28** |
| | (0.1 |
| Social and Institutional Resource_ Minority Population % | **-3.8** |
| | (0.6 |
| Ownership: For-profit | -0.58 |
| | (0.2 |

| VARIABLES | Qua |
|---|---|
| Ownership: Non-profit | 0.62 |
| | (0.2 |
| Hospital Size | -0.8 |
| | (0.1 |
| Teaching Hospital | -0.7 |
| | (0.1 |
| Medicare Discharge | 2.97 |
| | (0.8 |
| Medicaid Discharge | -1.9 |
| | (0.7 |
| Community Demand for Financial Assistance | -0.3 |
| | (0.0 |
| CMI Index | 1.79 |
| | (0.3 |
| Total Population | -0.0 |
| | (0.0 |
| Population over 65 Years Old | -5.8 |
| | (2.4 |
| Personal Income | 0.96 |
| | (0.3 |
| Uninsured Rate | 1.16 |
| | (1.7 |
| 2019Year | -0.2 |
| | (0.0 |
| 2020Year | 0.77 |
| | (0.1 |
| Observations | 3,47 |
| Number of Hospitals | 1,49 |

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Note: Estimated cut points are omitted here.

The empirical findings from our primary model are illustrated in Figure 1. Panels A and B show the coefficient plots of the predictor variables of our interest in hospital quality of care and patient satisfaction, respectively. Patient engagement, physical and financial resources, and human resources positively impact the quality of care and patient satisfaction, while minority share in the community is negatively associated with performance. Regarding point estimates of beta coefficients, the one on the community factor exhibits the highest value in an absolute term. Among those with positive impacts, physical and the number of physicians and dentists exhibit higher values than others, but the difference between the marginal impacts would not be statistically significant. The magnitude of impact on patient satisfaction is most considerable for the community factor, and the number of doctors would be most critical in patient satisfaction regarding the point estimates. Still, there is no statistical difference between the positive factors.

**Figure 1. Impacts of Resources on Hospital Quality and Patient Satisfaction**

Panel A. Hospital Quality

Panel B. Patient Satisfaction
Note: Dots show estimated beta coefficients from ordered logistic regression, and solid lines show 95% confidence intervals

**2. Sub-sample Analysis**

We conduct a sub-sample analysis to deepen our analysis of patient engagement's role. We estimate the ordered logistic regression models for two groups of observations – one with an established PFAC and the other without it. The model specifications are identical to our principal analysis, except for patient engagement as a predictor variable. Table 4 shows the estimation results for the quality of care. One notable difference between the two groups is the impact of human resources. For hospitals without patient input, only the number of doctors significantly improves the quality of care. However, for hospitals using patient engagement as their resource, the number of nurses per bed significantly predicts performance. A hospital with one more registered nurse per bed has 79.5% greater odds of receiving a higher quality of care score.

Table 4. Sub-sample Results – Quality of Care

| VARIABLES | Qua |
|---|---|
| | Wit |
| | (1) |
| | Beta |
| Physical Resource | 0.52 |
| | (0.1 |
| Financial Resource | 0.09 |
| | (0.2 |
| Human Resource_ Physicians and Dentists per Bed | 0.62 |
| | (0.3 |
| Human Resource_ Registered Nurses per Bed | 0.08 |
| | (0.0 |
| Social and Institutional Resource_ Minority Population % | -2.9 |
| | (0.9 |
| Ownership_Forprofit | 0.04 |
| | (0.4 |
| Ownership_Non-profit | 1.39 |
| | (0.3 |
| Hospital Size | -0.9 |
| | (0.2 |
| Teaching Status | -0.7 |
| | (0.2 |
| Medicare Discharge | 3.27 |
| | (1.3 |
| Medicaid Discharge | -1.0 |
| | (1.0 |
| Community Demand for Financial Assistance | -0.3 |
| | (0.1 |
| CMI Index | 1.31 |
| | (0.6 |
| Total Population | -0.3 |
| | (0.1 |
| Population over 65 Years Old | -6.7 |
| | (3.5 |
| Personal Income | 2.66 |
| | (0.6 |
| Uninsured Rate | 2.86 |
| | (2.7 |
| 2019Year | -0.4 |

| VARIABLES | Qua |
|---|---|
| | (0.1 |
| 2020Year | 0.60 |
| | (0.2 |
| Observations | 1,10 |
| Number of Hospitals | 590 |

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Note: Estimated cut points are omitted here.

Table 5 shows the sub-sample estimation results for patient satisfaction as the dependent variable. It shows similar results to the analysis on the quality of care. Physical resources, human resources, and community minority share are statistically significant for both subgroups in predicting patient satisfaction. However, the results of the human resource variables suggest that the roles of doctors and nurses would differ for each group. The number of doctors per bed significantly predicts patient satisfaction without patient engagement.

In contrast, the number of nurses plays a significant role in improving hospital satisfaction through patient engagement. For hospitals with patient input, adding a nurse per bed would increase the odds of having a better satisfaction score by about 165%. The overall findings from the sub-sample analysis indicate that hospital resources are essential in improving hospital performance regardless of whether the hospital has patient engagement. However, the roles of doctors and nurses show consistent differences across the groups, implying that each human resource would play a different role depending on patient engagement.

Table 5. Sub-sample Results – Patient Satisfaction

| VARIABLES | Pati |
|---|---|
| | Wit |
| | (1) |
| | Beta |
| Physical Resource | 0.86 |
| | (0.2 |
| Financial Resource | 0.00 |
| | (0.3 |
| Human Resource_ Physicians and Dentists per Bed | 0.85 |
| | (0.4 |
| Human Resource_ Registered Nurses per Bed | 0.14 |
| | (0.2 |
| Social and Institutional Resource_ Minority Population % | -3.0 |
| | (1.2 |
| Ownership_Forprofit | -1.2 |
| | (0.6 |
| Ownership_Non-profit | 0.49 |
| | (0.4 |
| Hospital Size | -2.58 |
| | (0.4 |
| Teaching Status | 0.07 |
| | (0.3 |
| Medicare Discharge | 2.40 |
| | (1.7 |
| Medicaid Discharge | 0.16 |
| | (1.4 |
| Community Demand for Financial Assistance | -0.18 |
| | (0.1 |

| VARIABLES | Pati |
|---|---|
| CMI Index | 2.78 |
| | (0.7 |
| Total Population | -0.7 |
| | (0.1 |
| Population over 65 Years Old | -11. |
| | (4.4 |
| Personal Income | 1.39 |
| | (0.8 |
| Uninsured Rate | 0.80 |
| | (3.5 |
| 2019Year | 0.13 |
| | (0.1 |
| 2020Year | 0.05 |
| | (0.2 |
| Observations | 1,10 |
| Number of Hospitals | 590 |

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Note: Estimated cut points are omitted here.

## V. Conclusions

This study adopts SRBV to investigate how hospital resources are associated with their performance. In addition to the general approach of SRBV, we focus on patient engagement as an essential resource for improving performance. We analyzed ordered logistic regression models with hospital-level datasets in the U.S. from 2018 to 2020. From the analyses, we found that physical and human resources would positively impact improving quality of care and patient satisfaction. In contrast, a higher percentage of the non-white population in counties negatively affects performance. Our key finding is that hospitals having established PFAC are more likely to perform better.

This study has made significant contributions to hospital management studies. First, it has presented a comprehensive model for examining the influence of different sets of strategic resources on hospital performance. This model aids in understanding the correlations between financial and physical, human and social resources and their impact on hospital quality of care and patient satisfaction. Second, this study has developed an SRBV, incorporating patient and family engagement as critical strategic resources to help organizations gain organizational sustainability. Empirical evidence demonstrates how patient and family engagement can be substantial resources for hospitals seeking to improve quality and meet patient needs. Therefore, this study introduced a novel insight into the resource-based approach to the role of patient engagement. Third, from a practical perspective, this research offers invaluable insights for healthcare managers and leadership to develop patient and family engagement. The theoretical bodies of SRBV pointed out the importance of capabilities that orchestrate and manage various resources. While PFACs correlate positively with organizational performance, each hospital should build up its capabilities to appropriately use patient and family engagement as a resource to achieve organizational sustainability. As a highly professionalized healthcare domain, patient and family engagement may often encounter organizational resistance, creating barriers between professionals and citizens (Batalden et al., 2021). Devising tailored strategies, practices, and cultural and educational efforts is imperative to facilitate effective integration within organizational processes. For example, hospital managers should develop training and orientation programs for professionals and co-producers to understand each other and fill the knowledge, expertise, and experience gap.

This study is subject to a few limitations. First, while it sheds light on the empirical evidence regarding the influence of Patient and Family Advisory Councils (PFACs) on organizational performance, it employs a binary measure of whether hospitals operate such councils. Therefore, it does not furnish detailed insights into the specific roles and contributions of PFACs toward hospital performance improvement. Future research

could delineate each PFAC's role, participation degree, and decision-making authority within the analytical framework to resolve this gap. Second, this study's time frame spans from 2018 to 2020. Expanding the time frame of the investigation would enable a more comprehensive understanding of how the roles and impacts of PFACs may evolve. Therefore, future studies should broaden their time frame to capture the dynamic nature of PFAC engagement and its consequential effects over a long-term period. Last, this study examined the relationship between financial, human capital, social, and patient engagement resources and hospital performance. Still, it did not account for organizational capabilities to organize and manage these resources. Future research should consider the resources and the capabilities required to utilize them effectively.

**Conflict of Interest**

The authors have no competing interests.

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