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Exploring the Association between Quality and Financial Performance in U.S. Hospitals: A Systematic Review

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ABSTRACT

Hospital reimbursements are being tied to Quality Performance more every day. With this being the case, some hospitals have been financially penalized due to their relative low quality scores. Despite the strengthening bond between quality and financial performance, there seems to be lack of attention by researchers about this relationship. This study aims to explore the relationship between financial performance and quality in US Hospitals by conducting a systematic review of the literature. The search of three well-established databases including PubMed, ABI Inform, and Scopus generated 3,303 manuscripts. After excluding articles by a priori criteria (i.e., non-empirical, non-relevant, duplicates,), 13 manuscripts remained for abstraction. This is the first systematic review that focuses on the relationship between quality and financial performance among US hospitals. The finding of limited numbers of studies indicates that the research on the link between quality and financial performance is in its infancy at best. Therefore, there is a need for additional studies that are concerned with the relationship between healthcare quality and financial performance.

INTRODUCTION

A recent failed attempt to repeal and replace Patient Protection and Affordable Care Act (PPACA) of 2010 brought the ever-increasing health care costs in the U.S. under scrutiny one more time. According to the center for Medicaid and Medicare Services (CMS), U.S. healthcare spending increased by 5.8 percent in 2015. This brings the total spending of the U.S. Healthcare Systems to 3.2 trillion dollars or $9,990 per person per year. Healthcare costs account for 17.8 percent of the U.S. Gross National Product. More specifically Hospital care accounted for 32% (the largest share of all service types) of this 17.8 percent (3.2 trillion dollars) or about $1 trillion in 2015 ("NationalHealthAccountsHistorical," 2016). There has also been growing interest in the quality of the care in U.S. This interest in quality of care is expected to continue since there seems to be no easy solution or viable alternative for PPACA, which includes many mechanisms that incentives better quality of care. Due to their impact on the hospitals bottom line, financial incentives that ties reimbursements to the quality of healthcare services (i.e. pay for performance, value-based purchasing, accountable care organizations, etc.) occupies a prominent place in strategic decision-making processes. These changes in reimbursement are causing some hospitals to be punished financially for not having acceptable levels of quality performance. For example, value based purchasing could penalize a hospital up to 2% of reimbursements. Value based purchasing operates under the Inpatient Prospective Payment System which affects about 3,000 hospitals across the United States ("Hospital Value-Based Purchasing," 2017). According to AHA there are 5,564 hospitals in the United States (ahahospitals, 2017). Therefore, value based purchasing affects approximately 54% percent of all U.S. hospitals and this is only one initiative that ties quality performance to financial performance.

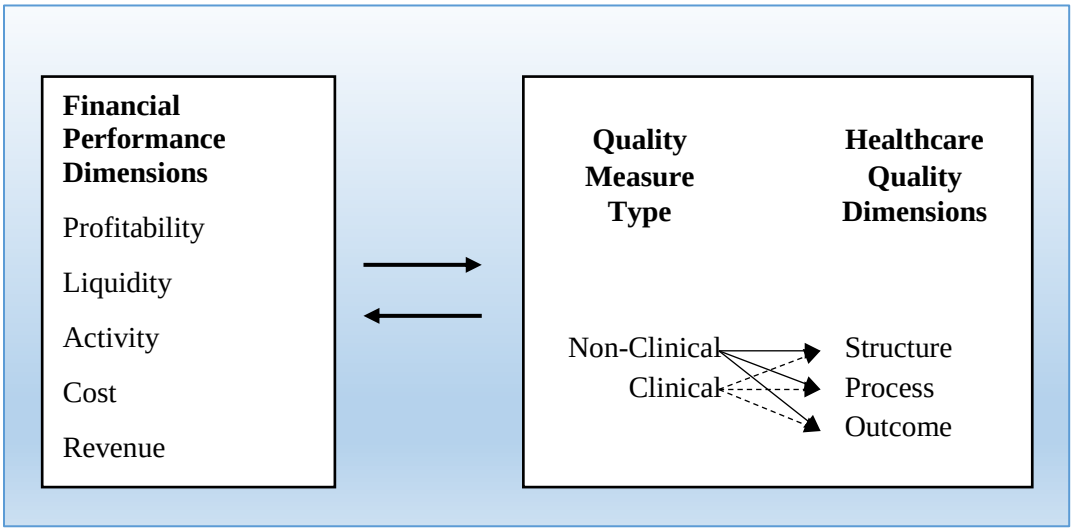
Despite the ever-increasing dependence on quality in determining reimbursement of hospitals, there seems to be a lack of attention among researchers regarding the association between quality and financial performance. This lack of attention is evidenced in a previous systematic review on the relationship between quality and financial performance by having only 16 studies in all healthcare settings (Beauvais & Wells, 2006). To date, this is the only systematic review that accounts for the literature on the relationship between quality and financial performance. Given that systematic reviews are considered to be very useful in analyzing, integrating and synthesizing large amounts of information from the literature, they have substantial potential in guiding the future research. Therefore, a more current systematic literature review that accounts for the recent research trend on the association between quality and financial performance, preferably in more focused healthcare settings (e.g. hospital) is needed to guide future studies.

This study contributes to the literature by updating the work of Beauvais and Wells by including studies after 2006 as well as having a more focused setting (i.e. hospital). A more focused setting will allow for more inferences to be drawn and fewer limitations to be placed on the study. Hospital was chosen as the setting for this study as it holds the largest share of the healthcare market and therefore is affected the most by the ever-increasing incentives that tie quality to the financial reimbursements. Ultimately, the goal of this study is to determine and document the research trends and results to date for the benefit of researchers, practitioners, and administrators.

CONCEPTUAL FRAMEWORK

In our conceptual framework (Figure 1) seven dimension of financial performance were identified using a previous systematic review involving financial performance (Oner et. al., 2016): profitability, liquidity, capital structure, activity, cost, revenue, and utilization. There are three type of quality measures that make up Donabedian's Structure-Process-Outcome (S-P-O) Quality Framework consisting of Structure, Process, and Outcome (Donabedian, 2005). The three measures in Donabedian's model are defined as follows: 1) structure measures include resources available to the healthcare organization being evaluated; 2) process measures include activities involved in the delivery of care to the patient; 3) outcome measures are the results of the treatment that a patient received (Donabedian, 1997).

Figure 1. Conceptual framework for literature review conducted on quality of care and financial performance in 13 studies.



Seven dimensions of financial performance are defined as follows: 1) profitability refers to measures that involve the hospital's ability in making a return, such as profit margin and return on assets; 2) liquidity measures refer to hospitals' ability to fulfill cash obligations, such as days cash on hand and net days revenue in accounts receivable; 3) capital structure refers to the measures that evaluates a hospitals financing structure, such as debt service coverage and equity financing; 4) activity measures refer to the ability to convert products or services into sales, such as total asset turnover and fixed assets turnover; 5) cost measures refer to the amount of money used in various fashions, such as labor cost, hospital expenses per bed, total expenses per bed, and operating expenses; 6) revenue measures refer to the amounts and sources of acquired revenues, such as net patient revenue per bed, net revenue, net patient revenue per adjusted discharge, and revenue per admission; 7) utilization measures refer to the usage of facilities, such as occupancy rate and average daily census acute beds per swing beds (Oner et. al, 2016).

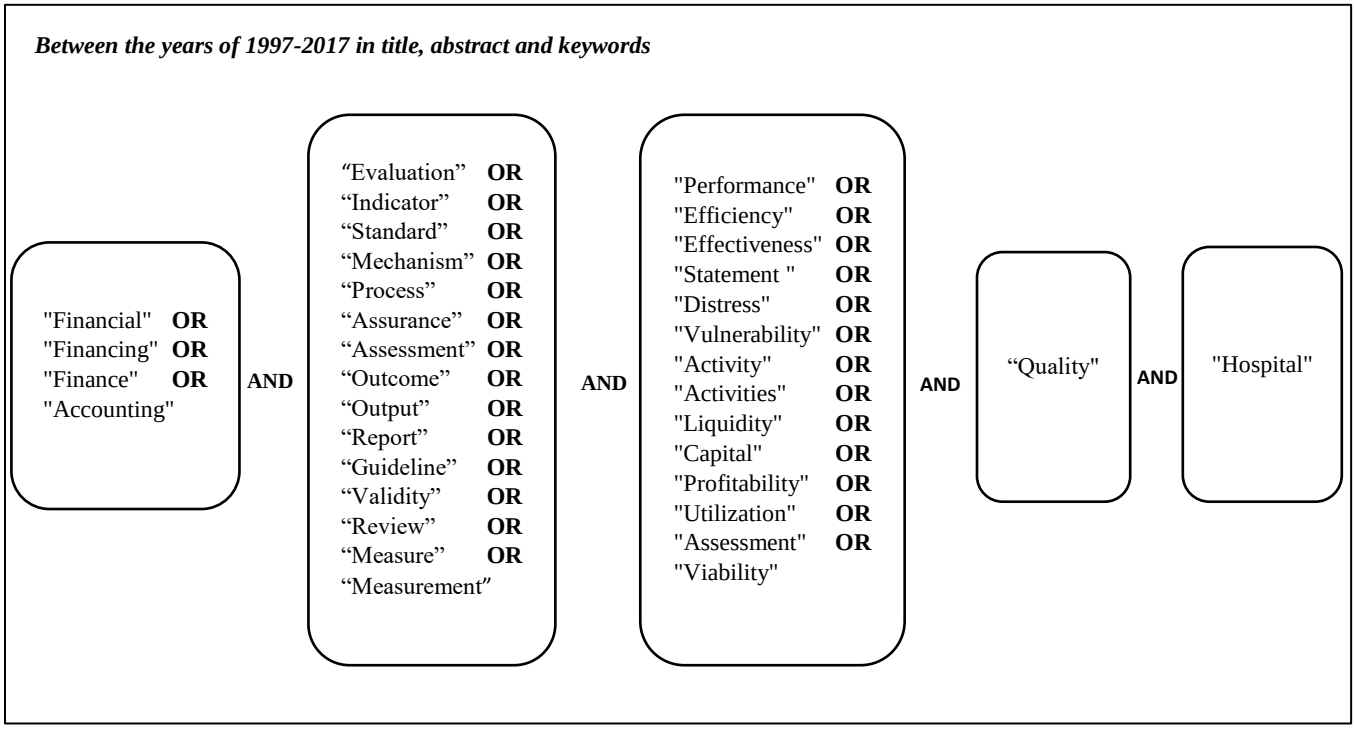
Based on the conceptual framework (figure 1), four research questions were developed to guide the review:

1. What are the study characteristics of the abstracted studies?
2. What types of hospital quality measures were used in the studies?
3. What types of hospital financial performance measures were used in the studies?
4. What are the major findings in regards to the relationship between Quality and Financial Performance?

METHODS

This literature review was guided by the preferred reporting items for systematic reviews and meta-analyses (PRISMA) (Liberati et al., 2009). The literature search included three steps. First, we defined the keywords for quality performance, financial performance, and hospital setting. Second, the keywords were arranged in a well-designed search strategy using the Boolean operators AND and OR (see Figure 2). The keywords were then searched in three established databases (ABI Inform, Pub Med, and Scopus). To optimize the chances of finding the relevant results the following filters were applied into the searches: 1) published between the years 1997-2017, 2) keywords in the title or abstract, and 3) published in English and in a peer review journal.

Figure 2. Search strategy and used keywords

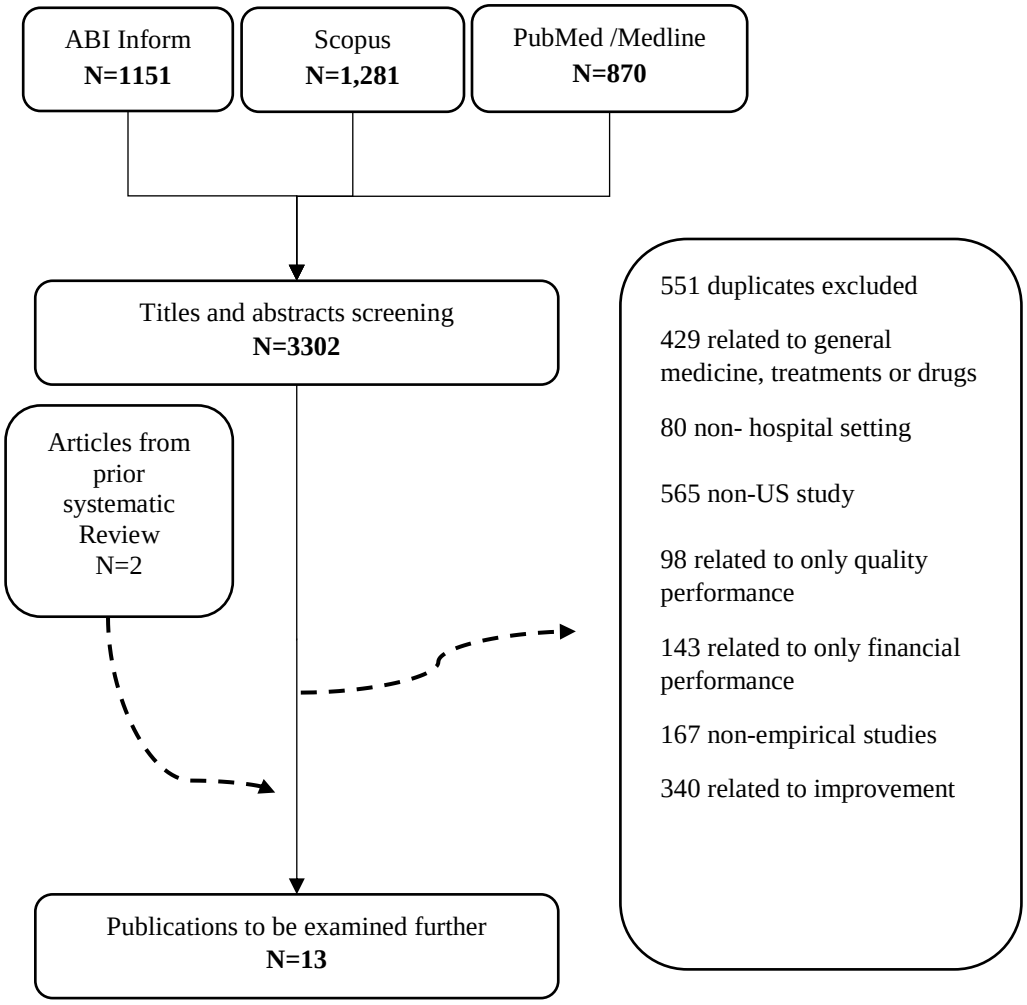


The search strategy and its steps are graphically depicted in the flow diagram in Figure 3. The initial search results generated a total of 3,302 articles including: 1,151 from ABI Inform, 870 from PubMed, and 1,281 from Scopus. All articles (n=3302) including title and abstract were uploaded into Thomas Reuters EndNote Reference Management Tool (Version 8). The removal

of 551 duplicates resulted in 2,751 for further review. Articles were then excluded if they met any of the following criteria: 1) not relevant to clinical and financial performance instead related to general medicine, procedures or drugs; 2) setting outside of the hospital; 3) non-US studies; 4) related to only quality or only financial performance; 5) non-peer reviewed, non-empirical studies; or 6) studies that were related to improvement and were not related to financial and quality performance.

After application of exclusion criteria, 11 studies remained. We added two more studies to our systematic review by checking the references from the prior systematic review and the references of the abstracted 13 studies. These studies were then added Thomas Reuters EndNote Reference Management Tool Version 8 with the other related articles. The steps above resulted in 13 relevant studies for further examination and abstraction (Figure 3).

Figure 3. Flow diagram of included studies (Adopted from PRISMA, Liberati et al., 2009).



Using Microsoft Excel we captured general information and key results from each study and recorded them in a Microsoft Excel including the following columns and categories which are provided in parentheses: Author, Year, Study Period, Sample, Study Design (Longitudinal, Cross Sectional), Location (single state, multiple states, national), Hospital Type (Acute Care, community, military), Hospital Ownership (for-profit, not-for-profit, non-public, government), Quality Variable/s, Financial Variable/s, Quality Measure Type/s (structure, process, outcome), Financial Dimension/s (profitability, liquidity, capital structure, activity, cost, revenue, and utilization), and the relationship between Independent and Dependent variable, and Findings.

RESULTS

The main goal of this systematic review was to assess literature concerning the relationship between Financial Performance and Quality in U.S. hospital. We aim to provide a comprehensive set of figures and descriptions synthesizing the characteristics and results of all studies that attempt to explain the relationship between quality and financial performance.

Table 1 includes characteristics from all included studies. All the included studies were published in Health-related journal. Due to their importance, it would be beneficial to emphasize several characteristics from Table 1. For example, most study designs (54%) were cross-sectional in nature, while 38% were longitudinal. One study utilized both designs. 54% of studies used national sample levels while the remaining 46% were equally divided to multi states (23%) and single state (23%) sample levels. Acute care accounted for the majority (85%) of hospital types while both military and community hospitals were utilized in one study each.

Table 1. Characteristics of 13 Abstracted Studies published in health-related journals

Characteristics (N=13)	Frequency	Percentage (%)
Study Design		
Cross-Sectional	7	54%
Longitudinal	5	38%
Both	1	8%
Sample Level		
National	7	54%
Multi states	3	23%
Single state	3	23%
Hospital Type		
Acute care	11	85%
Military	1	8%
Community	1	8%
Hospital Ownership		
For-profit	2	15%
Government	1	8%

Non-Public (non-government)	2	15%
Not limited to a subgroup	8	62%

Figure 4 illustrates the distribution of the years in which the 13 studies were published as well as the data beginning and ending year. The range of publication years abstracted is 17 years with the oldest publication being 1999 and the most recent publication being 2015. With the frequency of three, the year 2007 had the highest numbers of publications. The oldest data used in abstracted studies was from 1990 while the most recent data used was 2012. Data beginning years ranged from 1990-2008 while data ending years ranged from 1992-2012. Stock (2014) uses the most recent beginning data year. Two studies, Richter & Muhlestein (2016) and Dong (2015), utilizes more recent data however, they also incorporate data older than 2008. The largest data range was five years and it is incorporated in five of the studies. The data ranges include 1990-1995, 1995-2000 (2), 2005-2010, and 2007-2012. Four of the studies used data from only one year.

Figure 4. The data beginning and ending years of the thirteen abstracted studies

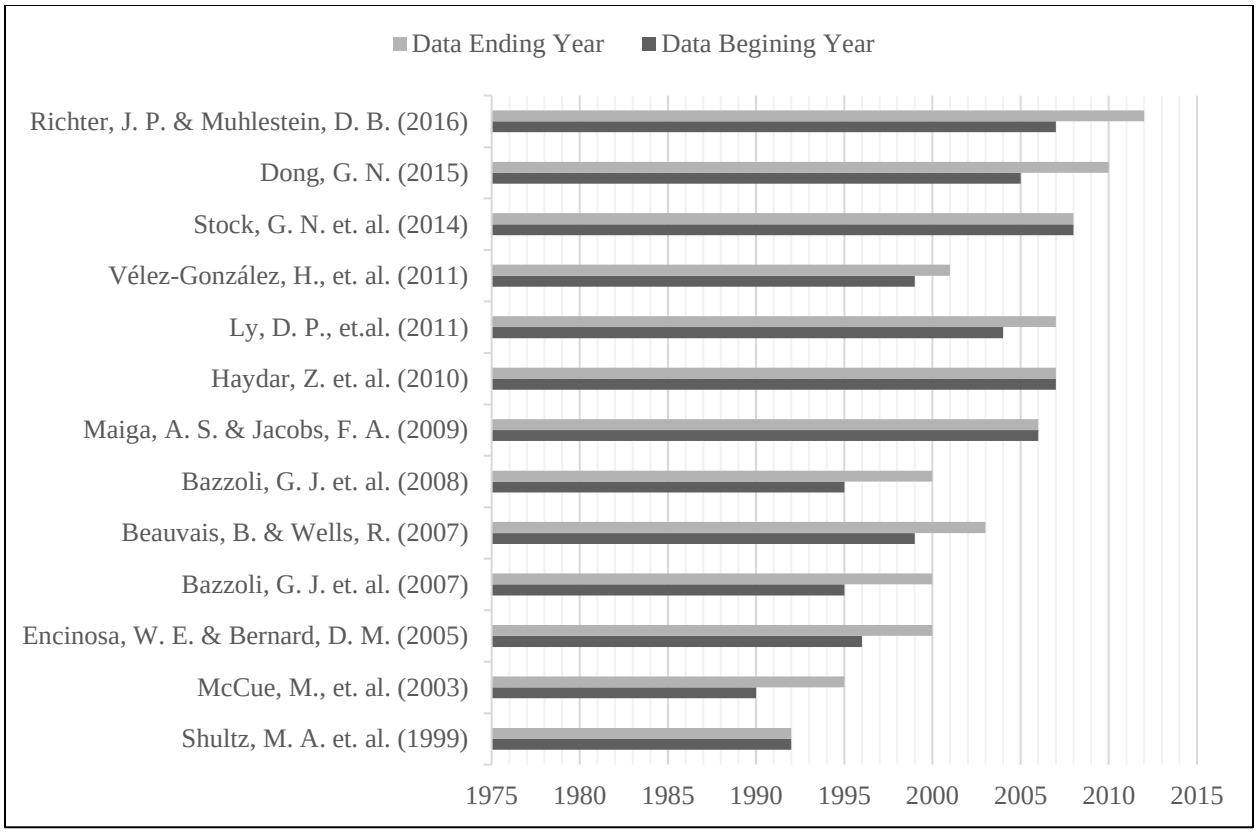


Table 2 illustrates the distribution of variables in abstracted studies. Five studies used quality performance as an independent variable and seven studies used financial performance as an independent variable. One study (Haydar et. al, 2010) used quality and financial performance as the independent variable. Most studies used an outcome measure for assessing quality and profitability for assessing financial performance. Four studies used more than one dimension to

assess financial performance and two studies used multiple quality measures to assess quality. Six of the 13 studies abstracted use only one quality measure and one financial dimension. In summary, over one-half (seven) of the studies used more than one financial dimension or quality measure in the study.

Table 2. Independent and Dependent Variables and Their Use in 13 Abstracted Studies

Used as an independent variable	**Used as a dependent variable**								
	Outcome	Process	Structure	Profitability	Cost	Revenue	Liquidity	Activity	Other
Outcome				E,I,H	I	J			F
Process				E,H,M					
Structure				M					
Profitability	A, G	B,D							F
Cost	C, K, L								F
Revenue		B,D							
Liquidity		D							
Activity		D							
Other									

A: Bazzoli, G. J. et. al. (2008), **B**: Bazzoli, G. J. et. al. (2007), **C**: Beauvais, B. & Wells, R. (2007), **D**: Dong, G. N. (2015), **E**: Encinosa, W. E. & Bernard, D. M. (2005), **F**: Haydar, Z. et. al. (2010),**G:** Ly, D. P., et.al. (2011), **H**: Maiga, A. S. & Jacobs, F. A. (2009), **I:** McCue, M., et. al. (2003), **J:** Richter, J. P. & Muhlestein, D. B. (2016), **K:** Shultz, M. A. et. al. (1999), **L:** Stock, G. N. et. al. (2014), **M: Vélez**-González, H., et. al. (2011)
Note: Red Font indicates a study based on one quality measure whereas **black font** represents studies using more than one quality measure or financial dimension

The qualitative data from the studies were analyzed and the findings are summarized in Table 3 and 4 qualitatively. For the sake of organization, we summarized the studies that used financial performance as the independent variable (Table 3) first, then quality as an independent variable (Table 4). Table 3 summarizes seven total studies using financial performance as an independent variable. Four of these studies used outcome measures as defined in Donabedian's S-P-O framework such as mortality rates, HCAHPS scores, and patient safety indicators (Bazzoli, Chen, Zhao, & Lindrooth, 2008; Beauvais & Wells, 2006; Schultz, van Servellen, Litwin, McLaughlin, & Uman, 1999; Stock, McDermott, & McDermott, 2014). All four of these studies show that an improvement in financial performance is associated with better quality of care. One cross-sectional study utilized outcomes measures and found relationship between better financial performance and lower readmissions; however, no relationship with mortality rates (Ly, Jha, & Epstein, 2011). Two other longitudinal studies used process quality measures and both found that an improvement in financial performance is associated with better quality of care (Bazzoli et al., 2007; Dong, 2015).

Table 3

Studies examining the relationship between financial performance and quality with financial performance being the predictor

Author (Year)	**Study Period/ Sample/ Design/ Location**	**Hospital Type**	**Hospital Owner Ship**	**Quality Variable/s**	**Financial Variable/s**	**Quality Measure Type/s/ Alternative Quality Classification**	**Financial Dimension/s**	**Results**
Bazzoli, G. J. et. al. (2008)	1995 - 2000 / From 763 to 1058 hospitals / Longitudinal / Multiple states	Acute care	NLS	In-hospital mortality in low death DRGs, Surgical-related patient safety indicator, Nursing-related patient safety indicator	Operating margin, Cash flow to total revenues ratio	Outcome/Clinical	Profitability	The first and second quartile indicators for the cash flow measure were always positive in low-mortality DRGs and nursing-related adverse event models.
Bazzoli, G. J. et. al. (2007)	1995 - 2000 / 13,886 hospital-year observations for net plant assets analysis and 3,205 for the JCAHO analysis. / Longitudinal / Multiple states	Acute care	Non-Gov.	JCAHO scores	Net patient revenues per adjusted patient day, Cash flow to total revenues ratio	Process / Clinical	Profitability, Revenue	The improved financial performance leads to greater net plant assets and greater JCAHO standards compliance

Author (Year)	Study Period/ Sample/ Design/ Location	Hospital Type	Hospital Owner Ship	Quality Variable/s	Financial Variable/s	Quality Measure Type/s/ Alternative Quality Classification	Financial Dimension/s	Results
Beauvais, B. & Wells, R. (2007)	1999 - 2003 / 94 defense hospitals in a single cross section and 282 observations for CAHPS / Both Designs / National	Military	Government	HCAHPS scores	Funding per Enrollee	Outcome / Non-Clinical	Cost	There is a significant and positive association between financial strength and quality outcomes.
Dong, G. N. (2015)	2005 - 2010 / 13273 hospitals-years / Longitudinal / National	Acute care	NLS	HA and HF quality scores	Natural log of total assets, financial leverage, profit margin, asset turnover (sales to asset), current ratio, days cash on hand, days patient accounts receivable, average age of plant, total salary to revenue.	Process / Clinical	Profitability, Revenue, Liquidity, Activity	The changes in patient care quality are positively related to the changes in financial leverage, profitability and labor costs of the same hospital over time.
Ly, D. P., et.al. (2011)	2004 - 2007 / 3262 hospitals / Cross-Sectional / National	Acute care	Non-Gov.	A summary performance indicator score for AMI, CHF, and pneumonia	Operating margin	Process/Outcome / Clinical	Profitability	Compared to those in the bottom 10% of operating margin, those in the top 10% had higher process quality (e.g. 95.3 vs. 93.7, p=0.002 for acute

Author (Year)	Study Period/ Sample/ Design/ Location	Hospital Type	Hospital Owner Ship	Quality Variable/s	Financial Variable/s	Quality Measure Type/s/ Alternative Quality Classification	Financial Dimension/s	Results
								myocardial infarction [AMI]) and lower readmission rates (e.g. 19.7% vs. 22.4%, p<0.001 for AMI). No association between margins and mortality rates.
Shultz, M. A. et. al. (1999)	1992 / 373 hospitals / Cross-Sectional / Single state	Acute care	NLS	Mortality rate (by AMI)	Profit status (from the AHA Guide to the Health Field) and total operating expenses per patient day	Outcome / Clinical	Cost	Total operating expenses/patient day was significantly and positively associated with mortality.
Stock, G. N. et. al. (2014)	2008 / 121,132 hospitals with at least 1,000 cases / Cross-Sectional / Single state	Acute care	NLS	Mortality rate, HCAHPS Scores	Capital Spending	Outcome / Clinical, Organizational	Cost	Higher salaries were associated with better performance.

AMI: Acute Myocardial Infraction; **CHF**: Congestive Heart Failure; HF: Heart Failure; **HA**: Heart Attack; **DRG:** Diagnosis-related group; **HCAHPS:** Hospital Consumer Assessment of Healthcare Providers and Systems; **NLS:** Not Limited to a Subgroup; **Non-Gov:** Non-Governmental; AHA**:** American Hospital Association; **JCAHO:** Joint Commission: Accreditation, Health Care, Certification

Table 4 summarizes six total studies using quality as an independent variable. Regarding their study design, two studies (Haydar et. al., 2010; Maiga & Jacobs, 2009) were cross-sectional, the remaining four were longitudinal. One of the four longitudinal studies (McCue, Mark, & Harless, 2003) that used quality as an independent variable found no significant results. All other longitudinal studies showed

significant results. For example, Encinosa & Bernard (2005) found that the odds of having an adverse patient safety event increased as profit margins declined. Richter & Muhlestein (2016) found that patient experience is positively associated with profitability, and that as patient experiences declines the relationship becomes even stronger. The other two studies that used quality as an independent variable (Bazzoli et. al., 2008; Vélez-González et. al., 2011) found a positive relationship between quality and financial performance. The results of most of the abstracted studies show at least one positive relationship between financial performance and quality.

Table 4:

Studies examining the relationship between quality and financial performance with quality as an independent variable

Author (Year)	**Study Period/ Sample/ Design/ Location**	**Hospital Type**	**Hospital Owner Ship**	**Quality Variable/s**	**Financial Variable/s**	**Quality Measure Type/s/ Alternative Quality Classification**	**Financial Dimension/s**	**Results**
Encinosa, W. E. & Bernard, D. M. (2005)	1996 - 2000 / 1,054,281 major surgery hospitalizations in 176 hospitals / Longitudinal / Single state	Acute care	NLS	Nursing-related patient safety events, Surgery-related patient safety events, All likely patient safety events, mortality rate	Operating margin	Process/Outcome / Clinical	Profitability	Patients have significantly higher odds of having adverse patient safety events when hospital profit margins decline over time.
Maiga, A. S. & Jacobs, F. A. (2009)	2006 / 313 hospitals / Cross-Sectional / National	Community	For-profit	Questionnaire-based process quality, clinical quality, patient satisfaction	Questionnaire-based operating profit, return on assets, return on investment	Process/Outcome / Organizational	Profitability	The clinical quality has a statistically significant and positive impact on both patient satisfaction (path coefficient 0.14, t 2.40) and cost performance (path coefficient = 0.22, t = 4.00).

Author (Year)	Study Period/ Sample/ Design/ Location	Hospital Type	Hospital Owner Ship	Quality Variable/s	Financial Variable/s	Quality Measure Type/s/ Alternative Quality Classification	Financial Dimension/s	Results
McCue, M., et. al. (2003)	1990 - 1995 / 1,235 observations from 422 hospitals / Longitudinal / Multiple states	Acute care	NLS	Mortality rate	Operating margin, operating expense	Outcome / Clinical	Profitability, Cost	The change in quality of care did not have a statistically significant effect on either cost or profits.
Richter, J. P. & Muhlestein, D. B. (2016)	2007 - 2012 / 19,792 observations from 3,767 hospitals / Longitudinal / National	Acute care	NLS	HCAHPS Scores	Net income, net patient revenue	Outcome / Organizational	Revenue	Significant and positive association between patient experience profitability.
Vélez-González, H., et. al. (2011)	1999 - 2001 / 499 hospitals / Longitudinal / National	Acute care	For-profit	JCAHO Scores	Total margin, operating margin	Structure/Process / Clinical, Organizational	Profitability	The joint commission's quality composite score positively related to total margin and operating margin
Haydar, Z. et. al. (2010)	2004 - 2007 / 236 hospitals / Cross-Sectional / National	Acute care	NLS	The composite quality score consists for AMI, HF, Pneumonia, and Surgical Care Improvement Project scores	Operating margin, debt to-capitalization ratio, return on assets, debt-to-cash flow ratio	Outcome / Clinical	Profitability, Cost	A statistically significant relationship between higher quality measures and more favorable bond ratings after controlling for traditional financial parameters.

AMI: Acute Myocardial Infraction; **CHF**: Congestive Heart Failure; **HF**: Heart Failure; **HA:** Heart Attack; **DRG:** Diagnosis-related group; **HCAHPS:** Hospital Consumer Assessment of Healthcare Providers and Systems; **NLS:** Not Limited to a Subgroup; **Non-Gov:** Non-Governmental; AHA**:** American Hospital Association; **JCAHO:** Joint Commission: Accreditation, Health Care, Certification

DISCUSSION

In this systematic review, we qualitatively summarized the studies on financial performance and quality from 1997-2017. As mentioned in the conceptual framework, our main goal was to account for the studies performed and the results of the studies. Our initial search resulted in 3,302 studies from three well-established databases (ABI Inform, PubMed, and Scopus) using an extensive and well-designed keyword strategy. After applying our exclusion criteria, we eliminated all but 11 studies. After examining a prior systematic review's references, the addition of two more studies brought the total up to 13 relevant studies to be researched further. After full-text review of these articles we qualitatively and quantitatively summarized the characteristics and results from the abstracted studies (Table 3 and 4). In the following paragraphs, we are going to emphasize important findings of this systematic review and provide recommendations for the future.

First, our findings confirmed that there has been a lack of attention among researchers about the link between quality and financial performance. Finding only 13 studies that are investigating the association between financial performance and quality in U.S. hospitals within the last 20 years confirms this phenomenon. If we average this number, there is less than one study per year that investigated the relationship between quality and financial performance. One may question this finding by considering the ever-growing reliance on quality in determining financial reimbursements. One way to explain the limited number of studies may be the unreliability that may be associated with certain quality measures. For example, outcomes measures are not solely the results of the healthcare provided. Many factors including: patient health, patient compliance, and environmental factors outside of the hospital can affect the outcome (Donabedian, 2005). Hence, it may be possible that the researchers tend to avoid this topic due to data limitations and difficulty in analyzing data. Another potential explanation would be the difficulty of linking quality and financial performance due to indirect relationship between them. Impact of quality on financial performance may be mediated or moderated by various other factors. There could also be many other confounding factors at organizational or market level such as organizational culture, competition, or managed care penetration that may make the relationship very complex and hard to identify.

Secondly, the publication years of the studies may also suggest interesting patterns that are worthy to discuss. Sixty-two of studies were published between the years of 2007 and 2011 and during this time, at least one study was published each year. It is possible that this is due to the 2008 election in which healthcare reform was a major platform for former President Barak Obama. The years following have higher amounts of published articles leading up the implementation of the PPACA in 2010. However, it is interesting that only two studies have been published since 2011which is one year after implementation of the PPACA.

Our third finding pertains to the sign and the significance of the relationship between quality and financial performance in the abstracted 13 studies. Although limited by numbers, the results of included studies predominantly show a positive relationship between financial performance and

quality performance in U.S. hospitals. Obviously, one would expect this predominantly positive association given the ever-increasing quality initiatives that are directly linked to the financial reimbursements. However, this may also be the result of the publication bias. The researchers who find significant and positive results may be the ones who are able to publish their studies. To overcome such a limitation, we investigated the gray literature to see if we were missing some important studies. We found quite a number of dissertations/thesis focusing on the relationship between quality and financial performance, (Au, 2016; Audi, 2014; Byrd, 2013; Clarke, 2005; Cusack, 2012; Dalton, 2008; Engineer, 2008; Wu, 2010; Zengul, 2013; Zhao, 2004). Publications of these dissertations/theses through blinded review processes would definitely enrich the existing literature on the relationship between quality and financial performance.

The predominant finding about positive association between financial performance and quality leaves policy makers and administrators with some choices. One would be to increase the reimbursements to the hospitals, however according to CMS healthcare spending reached 17.8% of the national GDP in 2015. Therefore, it is highly unlikely that reimbursements will go up any. The second more reasonable option would be to encourage and assist administrators to develop a more comprehensive financial management plan. Theoretically, this would improve financial performance and therefore may improve quality performance. It is also possible that penalizing low quality hospitals financially will lead to a further decline in quality. The last option would be to encourage and assist administrators to implement a comprehensive quality management plan. Quality management plans are closely related to the six domains of quality, which are defined by AHRQ as follows:

- “Safe: Avoiding harm to patients from the care that is intended to help them.
- Effective: Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and misuse, respectively).
- Patient-centered: Providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.
- Timely: Reducing waits and sometimes harmful delays for both those who receive and those who give care.
- Efficient: Avoiding waste, including waste of equipment, supplies, ideas, and energy.
- Equitable: Providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status” ("The Six Domains of Health Care Quality | Agency for Healthcare Research & Quality," 2017)

We believe that if the six domains of healthcare quality are followed closely both quality and financial performance will improve. Through this systematic we have found a relationship between the six domains of healthcare quality and improved financial performance. For example, about providing safe care, Bazzoli et al., (2008) found improved cash flow with lower nursing-related adverse events. Further, Encinosa & Bernard (2005) found a higher likelihood of adverse patient safety events in hospitals with lower margins. These two studies both show that providing safe care can improve financial performance and vice-versa. A focus on patient safety should be a staple

of all hospital quality management programs as well as financial management programs. Another demonstration of this could be that patient experience now has the opportunity to affect the reimbursement rates of hospitals. Richter & Muhlestein, (2016) found in their study that patient experience especially negative patient experience is associated with reduced profitability. Patient-centered care may have a positive relationship with profitability and this affect should be explored further. Ly et al., (2011) found a positive relationship between process quality and operating margins. Moreover, providing timely care could also improve patient satisfaction.

CONCLUSION

This is the only systematic review that accounts for the relationship between quality and financial performance in only hospital settings. There is an overwhelming lack of literature in this area. Future studies are needed to assess the relationship between quality and financial performance in U.S. hospitals. The current evidence in the literature suggest that the integration of quality and financial management plans may be very beneficial for hospitals. Many organizations separate the two functions; however, this may not be the best option. Quality and financial are closely related and should be treated as such. Integrating the two plans and staff could lead to a higher quality, higher financially stable hospital. Based on our findings, a future study could include a review of ambulatory care facilities regarding the relationship between financial performance and quality. It would be interesting to see if there is a lack of literature in this area as well. Also, Outcomes measures were used disproportionally more often than structure and process measures. Future studies could focus more on structure and process measures.

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