Patient Satisfaction as a Reflection of Quality Health Care and Outcomes

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December 4, 2015

Abstract:

Background: In 2006 the Centers of Medicaid and Medicare Services mandated that acute care centers begin submitting Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey data for financial reimbursement for Medicare patients. The national shift to a patient centered focus and the financial incentive to improve patient satisfaction scores has stimulated debate regarding the relationship between patient satisfaction and quality healthcare.

Clinical Question: Does improvement in patient satisfaction with their healthcare and its providers, as measured by the HCAHPS survey, improve healthcare quality and outcomes?

Design: Systematic literature review.

Methods: Searches were performed using PubMed and Scopus databases.The terms used for the PubMed search were "patient satisfaction" and "HCAHPS" with filters for full text, last 10 years and English. The terms for the Scopus search were "quality", "patient satisfaction" and "care" with filters for English, from 2010 and "Limit Exact Keyword 'patient satisfaction'."

Results: The PubMed search found two articles: Jha et al., and Kennedy et. al. Another study was located in PubMed using "frequently viewed together" hyperlink: Fenton, et al. The Scopus database search located an additional two articles: Lyu et a.l, and Tsai et al.

Conclusions: The relationship between patient satisfaction and healthcare quality remains elusive. Within this review, two articles showed a positive association, one showed a negative association and two that supported the null hypothesis. Limitations to the HCAHPS survey and various quality assessment tools prevent the adequate assessment regarding the association between patient satisfaction and healthcare quality. Further refinement of the HCAHPS and quality assessment tools are required to help determine a more concrete relationship.

Introduction:

The assessment of patient satisfaction in healthcare is not a new concept. Studies regarding patient satisfaction first appeared in the 1950's and since then, the topic has progressively received more attention.[1] In the early years, research focused on the appropriate tools to measure patient satisfaction and later progressed to studies that attempted to observe the relationship between satisfaction and quality of care.[1] The push to improve patient satisfaction within the nation's healthcare system began with two monumental reports in the early 2000's: The *World Health Report 2000*[2] from the World Health Organization and *Crossing the Quality Chasm*[3] by the Institute of Medicine.[4] Both reports focused on the need to balance both healthcare cost and quality, with the patient experience being an essential facet of hospital healthcare performance.[4]

To assess patient satisfaction there was a need for a reliable patient satisfaction measurement tool. In the 1980's, Press Ganey first introduced a well researched and reliable patient satisfaction survey.[5] Within the next decade, new patient satisfaction surveys, developed by organizations such as the National Research Corporation (NRC), HealthStream, and Gallup, began to emerge and eventually were used by a large number of hospitals across the nation.[5] These surveys eventually were used within emergency departments, ambulatory surgery and medical practice departments.[5]

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In a federal effort to quantify patient perspectives, the Centers for Medicaid and Medicare Services (CMS) and the Agency for Healthcare Research and Quality (AHRQ) began co-developing the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey in 2002. [6,7] With its release in 2006, the HCAHPS survey became the first nationally administered, standardized, patient satisfaction survey in the United States.[7] HCHAPS survey data is collected by acute care hospitals every month and is then submitted to CMS's Hospital Compare Website.[6] The Hospital Compare program has two main goals: to provide information to the public so that they may make informed decisions about where to receive medical care and provide incentives to both hospitals and medical providers for the improvement of satisfaction scores.[6]

The HCAHPS survey is composed of 32-items, divided into eleven measures: seven composite measures, two individual items and two global items. [8] The seven composite measures summarize the patient's perspectives within domains such as nurse communication, physician communication, hospital staff responsiveness, pain management, communication about medicines, discharge information, and if the patient understood their requirements of care post-discharge. [8] Two individual items ask questions regarding the cleanliness and quietness of the patient's hospital environment. [8] Possible responses to both composite and individual items are: always, usually, sometimes and never.[9] Finally, there are two global items that ask the patient to give an overall rating of the hospital (0-10 scale) and if they would recommend the hospital to friends or family.[9]

The HCAHPS survey is administered to a random sample of patients from 48 hours to 6 weeks post-discharge and is available to all payer types including Medicare patients.[10] The survey is provided to patients that have had a medical, surgical or obstetrical related visit at an acute care hospitals.[11] There are four different ways to respond to the HCAHPS survey: mail, telephone, mail with telephone follow up and interactive voice recognition.[10]

The Deficit Reduction Act of 2005 mandated that beginning in 2007, Inpatient Prospective Payment System (IPPS) hospitals would be required to submit HCAHPS data to the CMS and those that do not, are subject to receive a 2% reduction in their update payments.[10] Further, The Patient Protection and Affordable Care Act of 2010 mandated that the CMS begin to use HCAHPS data to calculate Hospital Value Based Purchasing (VBP) program payments to virtually all acute care centers beginning in 2012 for Medicare beneficiaries.[10] CMS uses this HCAHPS data within VBP program to help fulfill the triple aim of better patient care, better patient health, and lower medical costs.[12]

With the federal mandate emphasizing a more patient centered approach as well as the financial incentive for hospitals to increase HCAHPS scores, national attention has been drawn to the subject. Furthermore, there has been debate as to whether patient satisfaction is an appropriate indicator of better quality of patient care in the United States. This review attempts to determine if there is indeed a significant and positive relationship between higher HCAHPS scores and healthcare quality.

Methods:

A PubMed search was conducted on October 2nd, 2015 using the terms "HCAHPS" and "Patient Satisfaction" with filters for "Full Text", "Last 10 years" and "English". Using the "frequently viewed together" hyperlink on PubMed, an additional article was found. The PubMed search found a total of 75 articles. A SCOPUS search conducted on October 7th, 2015 using the terms "Quality" and "Patient Satisfaction" and "Care" searching within 'article title found a total of 57 articles using filters for "English", "From 2010" and "Limit Exact Keyword 'patient satisfaction'". There were a total of 132 articles with no

duplicates to remove. The 132 articles were screened and seven articles were found to be acceptable. Two of the seven articles were excluded because they did not meet the inclusion and exclusion criteria of the search **(Table 1)**. Five articles were evaluated in this review. The PRISMA flow chart outlines the process by which the studies were found (**Figure 1**).

Table 1. Inclusion and Exclusion Criteria	
Inclusion Criteria	**Exclusion Criteria**
The study utilizes the HCAHPS survey as the primary tool for patient satisfaction	The use of an alternative patient satisfaction survey
Highly used and studied quality assessment tool	The use of no quality assessment tool or one that has not been studied
USA based study involving hospitals nationwide	Studies do not involve hospitals throughout the nation.
Studies after 2008	Studies performed before 2008
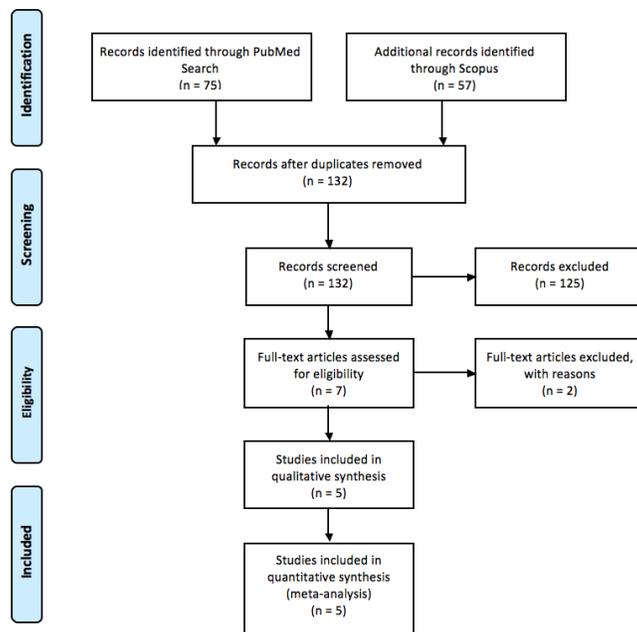
Figure 1. The PRISMA outlines the procedure by which the study's articles were found. Briefly, 132 were found through PubMed and Scopus search databases. 132 records were screened and 7 articles were assessed for eligibility. Finally, 5 studies were included in the qualitative synthesis.

Results:

Study 1:
Patients' Perception of Hospital Care in the United States. Jha et al.[9]

Objective:
Does hospital HCAHPS survey performance relate to performance indicators of clinical care quality?

Study Design**:**
The study used information collected from 4,032 hospitals that reported quality care data to the Healthcare Quality Alliance (HQA). However, 1,603 hospitals did not report HCAHPS scores to the CMS and, subsequently, were not used. Therefore, only the 2,429 hospitals that reported both quality care data to the HQA and patient satisfaction data to CMS from July 2006- June 2007 were included in the study. Out of the hospitals that reported patient satisfaction scores, 75% had 300 or more patients that submitted surveys and only 3% of the hospitals had less than 100 surveys. On average, there was only a 36% response rate for the HCAHPS survey.

The reported HCAHPS survey data was adjusted for the method of survey administration, non-response bias and case mix. The study found that the HCAHPS survey hospital global rating of 9 or 10 (0-10 scale) and "would definitely recommend the hospital" questions were highly correlated. Due to this correlation, the researchers used the fraction of patients that gave a 9-10 for the hospital's global rating as the primary indicator for overall patient satisfaction.

To measure the quality of clinical care, data was obtained from the HQA detailing the compliance of hospitals with 24 clinical process measures regarding the care for three medical conditions (acute myocardial infarction, congestive heart failure, and pneumonia) and prevention of surgical complications. The authors then calculated summary quality scores for each of the four parameters using the following calculation: number of times a hospital implemented appropriate care across all measures divided by the number of opportunities hospitals had to provide appropriate care.

Hospitals were then placed into quartiles based on the average proportion of patients who gave the hospital a 9 or 10 global HCAHPS rating. The means of HQA summary scores were analyzed for each HCAHPS quartile to determine the relationship between quality care and patient satisfaction. Finally, the independent relationship between HCAHPS and HQA scores were assessed using multivariable models to adjust for other hospital characteristics that may have influenced the results (number of beds, academic status, region, location, profit status, ratio of nurses to patient days, and percentage of patients receiving Medicaid).

Table 2. Inclusion Criteria:

Hospitals that reported HQA clinical process data for three conditions:
   1. Acute myocardial infarction
   2. Congestive heart failure
   3. Pneumonia

Hospitals that reported HQA clinical process data with respect to the prevention of complications for surgery
Hospitals that reported HCAHPS survey data for discharged Medicare patients

Results:
When performing the unadjusted analysis, the study found that HQA scores were 2-4% higher in the highest quartile than the lowest quartile. After adjusting for other hospital characteristics, there was a significant positive relationship found between the highest quartile of HCAHPS scores and mean HQA scores across all four conditions **(Table 3)**. In conclusion, patient satisfaction was associated with quality clinical care with respect to all four HQA conditions.

Table 3. HCAHPS scores vs adjusted mean scores for four measured conditions				
HCAHPS	**Acute Myocardial Infarction**	**Congestive Heart Failure**	**Pneumonia**	**Prevention of Surgical Complications**
Lowest quartile	93.4	82.7	88.5	82.8
Second quartile	94.5	85.2	90.1	84.3
Third quartile	94.6	85.5	90.7	85.2
Highest quartile	95.3	86.0	90.8	85.7
p-value for trend	<0.001	<0.001	<0.001	<0.001

Study Critique:
One strength of this study was that its linear regression models accounted for hospital characteristics that could influence both HCAHPS and HQA data, as different hospital characteristics may have a significant impact regarding patient satisfaction and clinical process scores. Briefly, linear regression compares the relationship between an independent variable and dependent variables. This study also used a large sample population from thousands of hospitals across the nation, giving it strong statistical power. It is important to note that although this study had an adequate study population, the hospitals that did not submit HCAHPS scores could have a significant impact regarding the relationship between patient satisfaction and health care quality. These hospitals may have been from areas with large variations in hospital characteristics and patient demographics. Another discrepancy possibly hidden by the large sample size is that there was only an average 36% response rate to the HCAHPS. This lack of survey response may have also influenced the HCAHPS and HQA associations. Although the author's have shown a statistically significant association between the highest and lowest HCAHPS quartiles of the four measured conditions the differences in HQA scores were only between 2-4%. In reality this difference in HQA scores may not be clinically significant.

Study 2:
Patient Satisfaction and Quality of Surgical Care in US Hospitals. Tsai et al.[13]

Objective:
To determine the relationship between surgical quality and efficiency with patient satisfaction.

Study Design:
Data from the American Hospital Association from 2010 and 2011 was used to identify key hospital characteristics such as hospital size, teaching status, region and ownership (public, profit, non-profit). This data was also used to calculate the percentage of discharges related to surgical care and

approximate the percentage of HCAHPS responses from surgical patients using multivariate regression models.

HCAHPS survey data was collected from 2,953 hospitals that performed at least 1 of the 6 procedures on Medicaid patients from 2010 and 2011 to create patient satisfaction quartiles (**Table 4**). It was found that a "global rating of 9 or 10" and patients that would "definitely recommend the hospital" were highly correlated. Due to this correlation, the study focused on the percentage of patients that definitely recommended a hospital as the primary indicator for overall patient satisfaction. The survey's data was adjusted for patient-level demographics and mode of administration.

Table 4. Inclusion and Exclusion Criteria

Inclusion Criteria:

Used the International Classification of Disease, Ninth revision, procedure codes to identify patients that had any of the following 6 surgical procedures:

1. Coronary artery bypass grafting
2. Pulmonary lobectomy
3. Endovascular aortic aneurysm repair
4. Open abdominal aortic aneurysm repair
5. Colectomy
6. Hip replacement

Exclusion Criteria:

1. Patient with concurrent valve repairs were excluded from the coronary artery bypass grafting sample.
2. Patients undergoing procedures in the month of december because of lack of data for the next year.
3. Patients in the fee-for-service system
4. Patients discharged from a federal hospital
5. Those discharged from hospitals not within the United States and District of Columbia.

Risk adjusted length of stay (LOS) was the study's' primary measure of surgical efficiency. LOS was calculated using discharge-level data for each procedure and then risk adjusted using the Elixhauser approach, which accounts for patient demographics and 29 comorbidities. The authors then calculated the expected LOS using multivariable Poisson regression using the previously determined Elixhauser comorbidities. Briefly, Poisson regression is statistical model that is used to count variables.[14] The authors then analyzed the expected vs observed LOS ratios for every hospital and then multiplied it to the national average to calculate the risk-adjusted LOS. Indirect standardization was used to make a composite LOS score for each of the six procedures. The relationship between patient satisfaction and risk-adjusted LOS was determined using linear regression. The data was further adjusted for hospital characteristics.

Surgical quality was defined using three established measures: Surgical Care Improvement Project (SCIP) process scores, risk-adjusted 30-day readmission rate and risk adjusted perioperative mortality. The SCIP is a national quality partnership of organizations interested in improving surgical care by

significantly reducing surgical complications.[15] The adjusted 30-day readmission rate and risk adjusted mortality rates were calculated for each of the previously described six conditions. Specifically, the readmission rates were calculated using the Elixhauser risk-adjustment approach to determine the expected vs observed ratio. Indirect standardization was then used to create composite scores for each procedure. Three distinct multivariate linear regression models for each surgical quality measure were used to compare with HCAHPS survey data.

Finally, because there are four different metrics of surgical quality, the authors calculated composite z scores by standardizing the four individual surgical measures to the same scale. The relationship between composite z scores and patient satisfaction was then determined using a multivariate linear regression model.

Results:
After accounting for hospital characteristics and volume, higher patient satisfaction was associated with shorter LOS after surgery. Hospitals within the highest quartile of patient satisfaction scores had LOS 0.6 days shorter (7.1 days) than hospitals within the lowest quartile (7.7 days) (P <0.001) (**Table 5**).

Table 5. Quality measurements vs HCAHPS patient satisfaction quartiles				
HCAHPS Quartile	LOS (days)	Surgical Process Score	Surgical Readmission Rate, %	Surgical Mortality Rate, %
Lowest Quartile	7.7	95.5	13.6	3.6
2nd Quartile	7.4	95.8	12.8	3.3
3rd Quartile	7.2	96.1	12.6	3.4
Highest Quartile	7.1	96.5	12.3	3.1

After accounting for hospital characteristics and volume, hospitals in the highest quartile of patient satisfaction were also found to have higher SCIP process scores (96.5 vs 95.5, P <0.001), lower risk-adjusted 30-day readmission rates (12.3% vs 13.6%, P < 0.001) and lower risk-adjusted 30-day perioperative mortality rates (3.1% vs 3.6%, P < 0.001) (**Table 5**).

Finally, the authors combined all facets of defined surgical quality (LOS, mortality, process, and readmissions) into a composite z score to determine if patient satisfaction scores had a positive association. Their analysis found that hospitals with the highest HCAHPS scores had the lowest z score, which indicated higher quality (-0.145 vs 0.010, P < 0.001).

Study Critique:
The study utilized data from a large sample of hospitals within the nation, giving it greater statistical power. The authors also accounted and adjusted for specific hospital characteristics that could influence patient satisfaction and adjusted for them accordingly in their analysis. In addition, surgical quality was defined by 4 characteristics: LOS, SCIP process scores, mortality rates and readmission rates. The Centers of Medicare and Medicaid Services focus on these four characteristics within their Value Based Purchasing and Hospital Readmission Reduction Program (HRRP) repayments, allowing for extrapolation of the relationship between satisfaction and well known parameters of surgical quality assessment.

A limitation of this study was that it utilized administrative data and thus the authors were unable to adequately account for factors not captured by billing codes such as socioeconomic status or compliance to medical regimens. Further, the study's focus on the Medicare population limits the extension of the findings to nonelderly Americans. The nature of the study is also limiting in that an observational study cannot identify a causal relationship, only associations.

Study 3:

The Cost of Satisfaction: A National Study of Patient Satisfaction, Health Care Utilization, Expenditures, and Mortality. Fenton et al.[16]

Study Objective:

To define the relationship between patient satisfaction and health care utilization, expenditures, and outcomes.

Study Design:

This was a nationwide prospective cohort study of adult respondents to the Medical Expenditure Panel Survey (MEPS) from 2000 through 2007. The MEPS is considered to be the most complete source of data on the cost and use of health care and health insurance coverage in the United States.[17]

Patients were included in the study if they responded to the MEPS, were at least 18 years old, and had one or more physician or clinic visits in the prior year. Exclusion criteria included poor self-rated health and the presence of 3 or more chronic diseases. These parameters resulted in a total study population of N = 51,946.

Table 6. Inclusion and Exclusion Criteria	
Inclusion:	Exclusion:
Must be at least 18 years old	Poor self-rated health
One or more physician or clinic visits in the previous year.	Presence of 3 or more chronic diseases

Starting in 2000, patients were assessed along four parameters: Satisfaction, Utilization, Expenditures, and Mortality.

Satisfaction was measured via the Consumer Assessment of Health Plans Survey (CAHPS: also known as the HCAHPS).[10] As patient satisfaction with physician communication was found to be strongly correlated with other CAHPS dimensions and with global satisfaction, aspects of physician communication were focused upon, including if the patient's physician: listened carefully, explained things in a way that was easy to understand, showed respect for what they had to say, and spent enough time with them. A fifth aspect of analysis was also added in which patients rated their health care from all physicians and other health care providers on a scale of 0 to 10 (from the worst to the best healthcare possible). Responses to all five aspects were averaged. High satisfaction was defined as a satisfaction response rating in the highest quartile when compared to all respondents. Low satisfaction was defined as a satisfaction response rating in the lowest quartile when compared to all respondents.

Utilization and expenditures were monitored beginning in 2001 and were assessed by three variables: emergency department visits or inpatient admissions, total healthcare expenditures, and expenditures for prescription drugs.

Mortality rates were assessed through the reported mean survival time for those enrolled 2001-2005.

Covariates were identified and adjusted for in an attempt to reduce confounding variables. These covariates included: socio-demographics, health behaviors, health care access, propensity to use health care, and health status.

The above parameters were assessed via logistic regression analysis and Cox proportional hazards regression. Descriptive statistics and parameter estimates were adjusted for the MEPS survey design. Analyses were performed using commercially available software (STATA/MP 12.0; StataCorp LP). Hypothesis tests were 2-sided, which allowed for statistical significance to be found at both the bottom and the top of the probability distribution, with α=.05. The study had no external funding source.

Study Results:
Respondents in the highest patient satisfaction quartile, relative to the lowest patient satisfaction quartile, had statistically significantly lower odds of any emergency department visit (adjusted odds ratio [aOR], 0.92; 95% CI, 0.84-1.00). However, these respondents also had statistically significantly higher odds of any inpatient admission (aOR, 1.12; 95% CI, 1.02-1.23), 8.8% (95% CI, 1.6%-16.6%) greater total expenditures, 9.1% (95% CI, 2.3%-16.4%) greater prescription drug expenditures, and 26% higher mortality (adjusted hazard ratio, 1.26; 95% CI, 1.05-1.53) (**Table 7**). The authors postulated that the corresponding increase in patient satisfaction, prescription drug expenditures, and mortality was not coincidental. It was suggested that clinicians might have provided possibly unnecessary prescriptions that increased patient satisfaction, but were ultimately detrimental to patient care.

Table 7. Patient satisfaction quartile vs healthcare quality variable				
	Lowest Quartile	Second	Third	Highest Quartile
Emergency Department Visits- Unadjusted %	17.6	14.7	13.6	14.3
Inpatient Admissions- unadjusted %	10.7	11.2	10.4	11.5
Total Healthcare Expenditures- unadjusted mean $	4,646	5,013	4,610	4,729
Prescription Drug Expenditures- unadjusted mean $	1,005	1,078	1,086	1,142
Mortality Hazard Ratio (p-value)	1 (Reference)	1.08 (0.47)	1.02 (0.82)	1.26 (0.02)

The association between higher patient satisfaction and mortality remained significant whether or not patients with poor self-rated health and 3 or more chronic diseases were included (aHR, 1.44; 95% CI, 1.10-1.88; P=.008).

Study Critique:
As this study utilized data that are nationally representative, it has high statistical power and the results may be extrapolated widely. This study also adjusted for many confounding variables, which strengthens the prospective relationship between patient satisfaction and the measured outcomes.

The study is limited in that patient satisfaction with the physician is the only domain of health care satisfaction addressed. Also, it fails to take into account care-seeking patterns that may explain patient satisfaction level variations regardless of physician actions. Finally, this study takes place over a relatively short time frame. Thus the relationship between sustained patient satisfaction and long-term utilization, expenditures, and mortality remains unexplored.

Study 4:
Is There a Relationship Between Patient Satisfaction and Favorable Outcomes? Kennedy et al.[18]

Study Objective:
To evaluate whether high patient satisfaction measured by HCAHPS surveys correlates with favorable outcomes.

Study Design:
This was a cross sectional study of hospitals that participated in the University Healthsystem Consortium (UHC) database from 2011 to 2012. The UHC aims to improve health care through the support of progressive academic medical centers.[19]

Hospitals were included in the study if they responded to the UHC database, the HCAHPS, and the SCIP. Hospitals were excluded if they were not a member of UHC database, had incomplete responses to the HCAHPS or SCIP, or had no surgically related outcomes (**Table 8)**. The final study population was N = 117 with 15.8% of hospitals from West, 28.1% from Midwest, 30.4% from Northeast, and 25.7% from the South.

Table 8. Inclusion and Exclusion Criteria	
Inclusion:	Exclusion:
Responded to all of the following: ● UHC database ● HCAHPS ● SCIP	Not a member of the UHC Database
	Incomplete response to HCAHPS or SCIP
	No surgically related outcomes

As this study was particularly concerned about surgical outcomes, data from adult patients discharged by a general surgeon were extracted from the database for the analysis.

Hospitals were defined based on geographic region, hospital size based on number of hospital beds, annual inpatient surgical volume, and percentage of cases that had an ICU stay at each institution. A

hospital qualified as large if the size cumulative size ranking based on the aforementioned parameters fell above the median of the study population. Hospital quality was assessed based on the in-hospital outcomes of length of stay, complications, and mortality. A hospital qualified as a high quality performer if its ranking for each of the outcomes was below the median of hospitals in the study population.
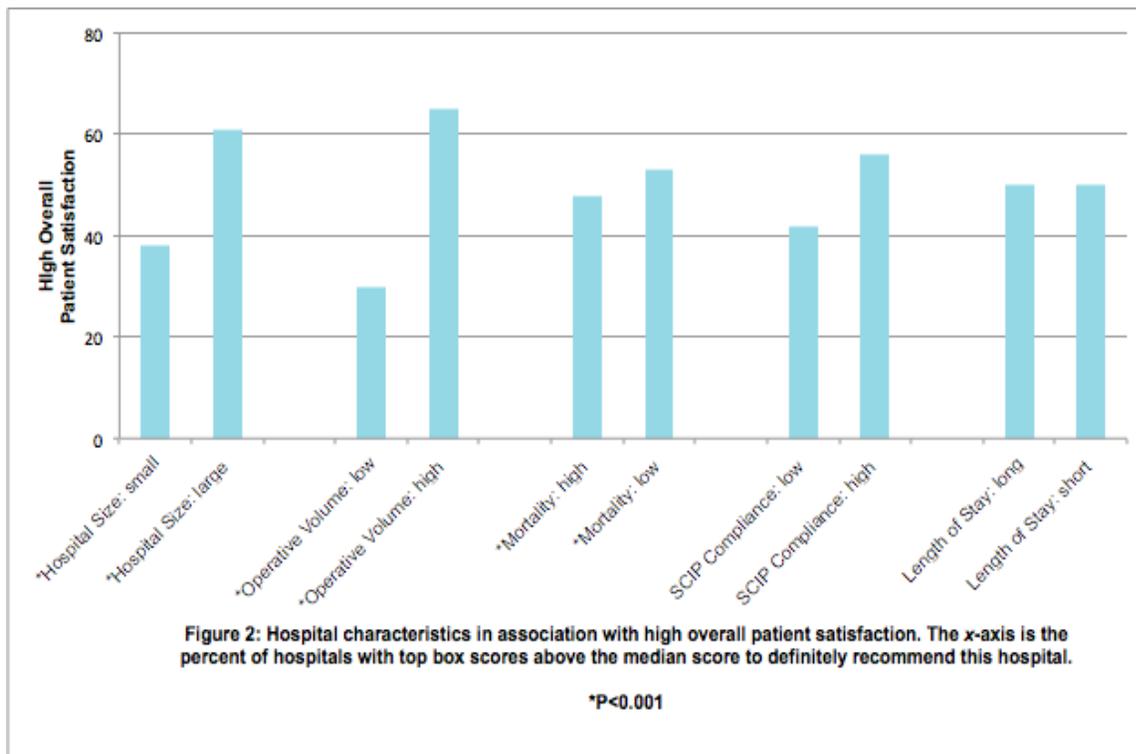
SCIP measures assessed and evaluated included: antibiotic timing, antibiotic selection, antibiotic end time, cardiac patients with blood glucose control, beta blocker therapy, venous thromboembolism prophylaxis, urinary catheter removal, and intraoperative temperature management. High performing hospitals were defined as those found to have scored perfectly.

High patient satisfaction was primarily defined as a proportion of patients above the median who responded "yes definitely" to the HCAHPS question "Would you recommend this hospital to friends and family?" These results were verified by evaluating the question "What number would you use to rank your hospital (range 0–10)?" High performers were those who scored above the median for a response of 9 or 10.

Chi-square analysis was used to evaluate for associations between the aforementioned explanatory variables and high performance on each satisfaction domain. A 2-tailed Pearson correlation test was used to determine relationships between continuous outcome variables and patient satisfaction. All statistics were performed in SPSS version 21 and P's < 0.05 were considered significant.

Study Results:

Large hospitals, high surgical volume, and low mortality were found to be significantly associated with high patient satisfaction (p < 0.001). However, compliance with SCIP process measures and patient safety indicators, as well as length of stay, were not significantly correlated with overall satisfaction. This indicates that patient satisfaction is not a gauge of patient safety and care effectiveness (**Figure 2**).

Figure 2: Hospital characteristics in association with high overall patient satisfaction. The *x*-axis is the percent of hospitals with top box scores above the median score to definitely recommend this hospital.

*P<0.001

Surprisingly, neither the presence of complications (P = 0.491) nor increased rates of readmission (P = 0.056) were found to affect patient satisfaction. Thus, factors outside of outcomes appear to influence patients' perceptions of their care.

Study Critique:
This study is widely applicable in that it drew data from a nationwide sample, evaluated multiple patient outcomes and hospital characteristics in relation to HCAHPS scores, assessed surgery-specific patient outcomes related to satisfaction, and included several HCAHPS domains in the analysis. However, application is restricted due to the fact that all hospitals included were academic medical centers.

Further limitations include the small sample size, which restricted parameter definitions to either above or below the median where the use of quartiles may have allowed for stronger correlation of variables. The study is also a cross section, which does not allow for following patients over time to see the long-term effects of satisfaction.

Study 5:
Patient Satisfaction as a Possible Indicator of Quality Surgical Care. Lyu et al.[20]

Study Objective:
To determine whether patient satisfaction is independent from surgical process measures and hospital safety.

Study Design:
The authors conducted a cohort study using data obtained from the HCAHPS, SCIP, and the employee Safety Attitudes Questionnaire (SAQ) (**Table 9**).

Table 9: Inclusion Criteria and Exclusion Criteria	
Inclusion:	Exclusion:
Respondents to all of the following: ● HCAHPS ● SCIP ● SAQ	Did not respond to one or all of the following: ● HCAHPS ● SCIP ● SAQ

Patient satisfaction was measured using the HCAHPS survey. The authors used the percentage of patients that gave a hospital a global rating of a 9 or 10 as the primary indicator of patient satisfaction.

To determine the relationship of process of care measures with patient satisfaction, the authors used the following 2009-2010 process of care measures: antibiotic prophylaxis, hair removal, Foley catheter removal, and deep vein thrombosis prophylaxis. The authors then analyzed the compliance rates with data obtained from the Centers for Medicare and Medicaid Services website.

Hospital safety culture data was obtained from US hospitals that participated in publicly reported metrics and the SAQ. Briefly, the SAQ is a validated, widely used survey that contains six domains: teamwork climate, safety climate, job satisfaction, perception of facility and local management, stress recognition, and working conditions.

This SAQ was provided to all providers within surgical departments using a variety of distribution methods: paper packets that were distributed within departments, and an online survey that was accessed using website tokens, and an online survey that was assigned using the last four digits of the provider's social security number along with a website token. The survey was administered in this way to ensure that survey takers were anonymous and responses were accurate. Pascal Metrics, Inc. was used for close follow up to confirm participation.

All hospitals had a response rate of 60% or greater. The percentage of respondents that reported a mean score of 4-5 at the hospital level was used as the overall safety culture score. An overall mean safety culture score for each hospital was analyzed using the average of individual domain scores.

The authors used log regression models to determine the relationship between patient satisfaction and process measures, and patient satisfaction and safety culture values. Patient satisfaction was used as the independent variable in both. The safety culture model included the previously listed six domains of the SAQ. Relationships between patient satisfaction and process measures or safety culture was assessed using Pearson R coefficients, where a 1 indicates a linear, direct relationship.

Study Results:
It was found that patient satisfaction is not associated with performance on process measures (antibiotic prophylaxis, $R = -0.216$ [$P = .24$]; appropriate hair removal, $R = -0.012$ [$P = .95$]; Foley catheter removal, $R = -0.089$ [$P = .63$]; deep vein thrombosis prophylaxis, $R = 0.101$ [$P = .59$]). Patient satisfaction was also not associated with a hospital's overall safety culture score ($R = 0.295$ [$P = .11$]). No association was found between patient satisfaction and the individual culture domains of job satisfaction ($R = 0.327$ [$P = .07$]), working conditions ($R = 0.191$ [$P = .30$]), or perceptions of management ($R = 0.223$ [$P = .23$] (**Table 10**).

Table 10: Statistical Analysis of Patient Satisfaction as it Relates to Surgical Quality Measures		
Surgical Quality Measure	R-Value	P-Value
Antibiotic Prophylaxis	-0.216	0.24
Appropriate Hair Removal	-0.012	0.95
Foley Catheter Removal	-0.089	0.63
DVT Prophylaxis	0.101	0.59
Overall Safety Culture Score	0.295	0.11
Job Satisfaction	0.327	0.07
Working Conditions	0.191	0.30
Perceptions of Management	0.223	0.23

This lack of association between satisfaction and standard process-of-care measures used as markers of surgical quality challenges the notion that a patient's level of satisfaction reflects the quality of a procedure and the overall quality of care received.

However, there was an association between patient and the individual culture domains of employee teamwork climate ($R = 0.439$ [$P=.01$]), safety climate ($R=0.395$ [$P=.03$]), and stress recognition ($R = -0.462$ [$P = .008$]).

Study Critique:
This study had a nationwide reach. Unfortunately the small sample size of 31 hospitals, and the fact that all of the hospitals were in the urban setting vastly limits the applicability of the findings to a larger population. There is also a disparity in assessment as specific surgical variables were used as an explainer for hospital wide patient satisfaction. In addition, the SAQ is voluntary. Thus it can be hypothesized that hospitals participating in the SAQ are preemptively biased towards higher quality of care. Also, like many of the other studies analyzed, the time frame of this study is relatively short and does not account for patient satisfaction impact on long-term outcomes.

Discussion:

Within this review, two studies have found a positive association between patient satisfaction in comparison to healthcare quality, two studies have found a negative association, and one study that has favored the null hypothesis (**Table 11**). Although this is a relatively small sample of the number of studies assessing the relationship between patient satisfaction and healthcare quality, it can be inferred that there is a considerable amount of variation in the conclusion regarding the topic. All studies within this review have used the HCAHPS surveys collected from hospitals across the nation, however patient satisfaction scores were drawn from hospitals that also fulfilled their inclusion criteria for quality assessment. Therefore, hospital characteristics such as location and patient demographics may have caused variable results. However, the majority of variation is most likely due to different quality assessment tools, adjusted variables and the different medical conditions assessed.

The differences in the assessment of healthcare quality and limitations for each quality measurement tool make it difficult to determine the true relationship between patient satisfaction and healthcare quality. Previous studies have shown that healthcare quality assessment tools may have significant variability in results. For instance, studies have brought into question HQA performance measures ability to distinguish significant differences in quality amongst different hospitals.[21] Additional studies have highlighted the limited predictive ability of quality measures in the hospital setting across the nation.[22]

One of the major disadvantages of observational studies, such as a cohort study, is that we can only infer that cause precedes an effect.[23] Therefore, we cannot conclude that high patient satisfaction scores *are* the cause of the better healthcare quality. Whereas a randomized control trial may fulfill the definitive criteria for contributory cause and efficacy, it would difficult to apply this model to the patient satisfaction and healthcare quality comparison as there is no definitive gold standard in the measurement of the two.[23]

The HCAHPS survey itself also has some limitations that need to be addressed. Studies have shown that perceptions of clinical care may have differences depending on the patient's race.[13] In addition, there may be significant differences in response rates within different hospitals as well as recall bias associated with HCAHPS surveys that have been submitted after a prolonged period of time.[13,24]

A major limitation of a patient satisfaction surveys is response bias.[25] Most patient satisfaction surveys, including the HCAHPS, utilize a random selection approach so that survey recipients represent the sample population.[25] However, random selection does not guarantee that individuals who respond to the survey are representative of the sample population.[25] This response bias may lead to an overestimate of

satisfaction in a patient population with an over inflation of scores in the least satisfied patients.[25] In addition, how the patient responds to the HCAHPS survey whether it be by mail, telephone, mail with telephone follow up, or IVR may also induce some response bias.[26] For instance, telephone and IVR modes of response for the HCAHPS survey have higher satisfaction scores than written and mixed survey responses.[26]

Most studies assessing the HCAHPS survey have to adjust for variables that affect satisfaction scores that are not directly related to hospital performance such as the survey's collection method, patient mix and nonresponse bias.[26] Studies within this review have accounted and adjusted for variables within their own patient populations. However, even if the researchers correctly identified all of the variables that could potentially bias the survey's results, the reader has to trust that the researchers have adjusted for them correctly.

Table 11. Overview of Results					
Study	Jha et al., 2008	Tsai et al., 2015	Fenton et al., 2012	Kennedy et al., 2014	Lyu et al., 2013
Design	Cross-sectional	Cross-sectional	Prospective cohort	Cross-sectional	Cohort
Sample Size and Setting	2,429 nationwide hospitals: • 75% had >300 Surveys • <3% had <100 surveys	2,953 nationwide hospitals	Respondents to the MEPS: N= 51,946 Patients	Respondents to the: UHC database, HCAHPS, and SCIP N = 117 Hospitals	31 hospitals in 10 states
Definition of Patient Satisfaction	9 or a 10 hospital rating on the HCAHPS Survey	"Definitely yes" response to recommending the hospital questionl on HCAHPS	Highest quartile of satisfaction with physician communication	Above the median for positive response to HCAHPS global ratings	Global rating of 9-10 on the HCAHPS survey
Measure of Health Care Quality	HQA 24 measures for 3 conditions: 1. Acute MI 2. CHF 3. Pneumonia Prevention of surgical complications	Efficiency: LOS Quality: 1. SCIP scores 2. 30 day readmission rates 3. Perioperative mortality	1. Utilizations 2. Expenditures 3. Mortality	Length of stay, complications, mortality, and compliance with SCIP measures	Process of care measures, CMS compliance rates, job
Result Data	Highest Quartile vs Lowest Quartile: **p < 0.001** Myocardial Infarction: 95.3 – 93.4 Congestive Heart Failure: 86.0 – 82.7 Pneumonia: 90.8 – 88.5 Surgery: 85.7 – 82,8	Highest Quartile vs Lowest Quartile: **p < 0.001** Length of Stay: 7.1 – 7.7 days SCIP Score: 96.5 – 95.5 Readmission Rate: 12.3 – 13.6% Mortality Rate: 3.1 – 3.6%	Highest Quartile vs Lowest Quartile: **CI = 95%** ED Visits: 14.3 – 17.6% Inpatient Admissions: 11.5 – 10.7% Total Expenditures: $4,739 – 4,646 Drug Expenditures: $1,142 – 1,005 Mortality Ratio: 1.26 – 1.00	Characteristics Associated with High Overall Patient Satisfaction: **p < 0.001** • Large Hospitals • High Surgical Volume • Low Mortality Characteristics Not Associated with High Overall Patient Satisfaction: **p > 0.05** • SCIP Compliance • Length of Stay • Presence of Complications • Increased Rates of Readmission	Characteristics Not Associated with High Overall Patient Satisfaction: Antibiotic Prophylaxis: **p = 0.24** Appropriate Hair Removal: **p = 0.95** Foley Catheter Removal: **p = 0.63** DVT Prophylaxis: **p = 0.59** Overall Safety Culture Score: **p = 0.11**
Summary of Results	Positive Association	Positive Association	Negative Association	No Association	No Association

Conclusion:

Does improvement in patient satisfaction with their healthcare and its providers, as measured by the HCAHPS survey, improve healthcare quality and outcomes?

Though the HCAHPS is the most widely utilized and researched patient care survey in the United States, its efficacy as an assessment of healthcare quality is still contentious. It has been demonstrated in this review that large, nationally representative studies have competing results on this topic. Given the

importance attributed to high HCAHPS scores by The Patient Protection and Affordable Care Act of 2010, understanding the exact implications of high patient satisfaction scores is becoming increasingly critical. However, current studies have numerous limitations which make it impossible to provide a definite answer the question at hand. In order to determine a causal relationship between improvement in patient satisfaction and improvement in healthcare quality and outcomes, further research correcting for current limitations in measurement tools, is needed.

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