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Abstract

Patient care experience surveys evaluate the degree to which care is patient-centered. This article reviews the literature on the association between patient experiences and other measures of health care quality. Research indicates that better patient care experiences are associated with higher levels of adherence to recommended prevention and treatment processes, better clinical outcomes, better patient safety within hospitals, and less health care utilization. Patient experience measures that are collected using psychometrically sound instruments, employing recommended sample sizes and adjustment procedures, and implemented according to standard protocols are intrinsically meaningful and are appropriate complements for clinical process and outcome measures in public reporting and pay-for-performance programs.

Short running title: Patient experience measures and health care quality

Key words: Patient experience, patient satisfaction, CAHPS, health care surveys, health care quality measurement, health care quality

Introduction

There is growing interest in assessing patients' experiences with healthcare and publicly reporting this information to help consumers choose among providers and plans (Farley et al., 2002; Hibbard & Jewett, 1996; Kolstad & Chernew, 2009; Spranca et al., 2000) and to stimulate, guide and monitor quality improvement efforts targeting patients' experiences of care (Browne, Roseman, Shaller, & Edgman-Levitan, 2010; Davies et al., 2008; Friedberg, SteelFisher, Karp, & Schneider, 2011; Goldstein, Cleary, Langwell, Zaslavsky, & Heller, 2001).

Patient care experience measures are also increasingly included in public reporting and pay-for-performance programs. The Patient Protection and Affordable Care Act of 2010 mandated that the Centers for Medicare & Medicaid Services (CMS) establish several public reporting and payment programs that incorporate information collected using the Consumer Assessments of Healthcare Providers and Systems (CAHPS®) surveys. For example, data from the CAHPS Hospital Survey (HCAHPS) is used in the Hospital Value-Based Purchasing Program, CAHPS Clinician & Group Survey (CG-CAHPS) data will be reported on the Physician Compare website, and a variant of CG-CAHPS is being used to evaluate Accountable Care Organizations (ACOs) participating in the Medicare Shared Savings Program.

National survey data indicate that 1 in 6 Americans consulted online rankings or reviews of doctors or other clinicians in the prior year and 1 in 7 consulted online rankings or reviews of hospitals or medical facilities (Fox & Duggan, 2013). In addition, there is growing evidence that clinicians and health plans are responsive to publicly reported information about patient

experiences of care. Data indicate that patients' experiences are improving. For example, hospitals' HCAHPS scores improved shortly after national implementation of that survey, possibly because hospitals were able to use patient experience data to improve patients' experiences (Elliott et al., 2010). In California, patient experiences with their physicians significantly improved following the introduction of statewide measurement, reporting, and performance-based financial incentives tied to CG-CAHPS scores (Rodriguez, von Glahn, Elliott, Rogers, & Safran, 2009). Anecdotal evidence of heightened interest in improving patient experience is apparent from press reports from individual hospitals (Aston, 2012; Bush, 2012; Merlino & Raman, 2013; Perna, 2013; Wachter, 2012), as well as the emergence of professional associations, peer-reviewed journals, conferences and websites dedicated to improving patient experiences of care (Cleveland Clinic, 2013; Hospital Impact; Institute for Healthcare Improvement; The Patient Experience Journal (PXJ)). Within hospitals, the appearance of formal positions, such as chief quality officer, and structures, such as departments of patient experience, have been linked to the growing importance of HCAHPS and other patient experience surveys (The Beryl Institute, 2013).

Websites specializing in healthcare, such as RateMDs.com, and user-generated review sites that provide a platform for consumer input across a range of industries, such as Yelp and Angie's List, publish Internet-based consumer reviews and ratings of physicians and other health care providers (Gao, McCullough, Agarwal, & Jha, 2012). Some research suggests positive correlations between online ratings and some clinical and patient experience measures (Bardach, Asteria-Penaloza, Boscardin, & Dudley, 2013; Greaves et al., 2012; Timian, Rupcic, Kachnowski, & Luisi, 2013). However, online reviews may be of insufficient number to draw

summary conclusions about a given provider, and are subject to tampering or fraudulent entries by patients or providers (Sepkowitz, 2008). Systematic measurement using representative samples is preferable for assessing patient experiences. Such measurement yields less biased data that are more useful for quality improvement than ad hoc user-generated reviews (Elliott & Haviland, 2007). CAHPS surveys are premised upon systematic and standardized measurement and are widely regarded as the national standard for collecting and reporting information from patients about care experiences (de Silva & Valentine, 2000; National Quality Forum, February 2013; U.S. Department of Health and Human Services, April 2012).

The Agency for Healthcare Research and Quality (AHRQ) launched the CAHPS project in 1995 to develop standardized surveys that could be used to assess the experience of consumers receiving different types of health care (Daniels, Shaul, Greenberg, & Cleary, 2004; Darby, Crofton, & Clancy, 2006; Hargraves, Hays, & Cleary, 2003; Homer et al., 1999; Landon, Zaslavsky, Bernard, Cioffi, & Cleary, 2004). Initial CAHPS surveys focused on ambulatory care delivered by health plans (Goldstein, et al., 2001; Hargraves, et al., 2003; Hays et al., 1999). Subsequently, additional CAHPS surveys were developed to assess experiences with physicians and physician groups (Hays, Chong, Brown, Spritzer, & Horne, 2003; Solomon, Hays, Zaslavsky, Ding, & Cleary, 2005), care in hospitals (Giordano, Elliott, Goldstein, Lehrman, & Spencer, 2010), behavioral health care (Eisen et al., 2001), nursing homes (Frentzel et al., 2012; Sangl et al., 2007), hemodialysis centers (Weidmer et al.), and other health care settings. Efforts are underway to develop CAHPS surveys to assess care experiences with Accountable Care Organizations, Health Insurance Exchanges, ambulatory surgery centers, emergency departments, and hospices.

CAHPS surveys focus on *patient care experiences* that reflect the quality of care provided. Most CAHPS survey items elicit patient reports about specific experiences (e.g., "In the last 6 months, how often did this provider listen carefully to you," or "Before giving you any new medicine, how often did the hospital staff tell you what the medicine was for"); CAHPS surveys also elicit global evaluations or ratings (e.g., "Using any number from 0 to 10, where 0 is the worst provider possible and 10 is the best provider possible, what number would you use to rate this provider?"). Survey content and implementation procedures are designed to allow comparisons across a range of patients (e.g., both the privately insured and those in publicly funded programs such as Medicaid, or inpatients treated in the medical, surgical and maternity care service lines of a hospital) and health care delivery systems (e.g., fee-for-service and managed care plans).

New Contribution

Numerous articles documenting the reliability and face, content, and construct validity of the CAHPS surveys have been published (Crofton, Lubalin, & Darby, 1999; Darby, Hays, & Kletke, 2005; Hays et al., 2013; Martino et al., 2009). As the use and financial impact of patient experience surveys have increased, attention to the relationship between patient experiences and other aspects of care has grown. Many have argued that patient experiences are an integral aspect of care quality even if unrelated to clinical processes or outcomes (de Silva & Valentine, 2000), but users are increasingly interested in understanding how patient experiences are associated with measures of structures, processes, and outcomes. Such knowledge could help providers improve the efficiency and effectiveness of care.

In this article, we address these questions by reviewing the literature on the associations between patient experience measures and other indicators of health care quality. A recent systematic review of the links between patient experience and clinical safety and effectiveness (Doyle, Lennox, & Bell, 2013) included studies with a broad range of research designs and methods of assessing patient experiences. In this article, we focus on articles that report results from CAHPS surveys, the most widely used source of patient experience measures in the U.S. Here, we include articles from the Doyle et al. review that employ methods that allow for rigorous estimation of the association between patient-reported experiences and processes and outcomes of care, and integrate the findings with those from a literature review specifically designed to identify articles reporting on CAHPS surveys.

Search Strategy

Beginning with the 40 individual studies cited by Doyle et al. (2013), we excluded studies that did not test associations between patient-reported experience measures and processes or outcomes of care (e.g., articles about malpractice or patient self-management programs, or articles assessing drivers of overall patient experience ratings; n = 11); did not employ patient-reported measures of experience (n = 3); measured patient experiences and outcomes of care concurrently, making it particularly difficult to assess causality (n = 5); or used qualitative methods (n = 1). We conducted an additional literature search to identify peer-reviewed research that used CAHPS surveys to measure patient experience. To do so, we searched the PubMed database for English-language articles published from 1990 through 2013, applying combinations of the search terms CAHPS, HCAHPS, Medicare Hospital Compare, and quality, to the title and abstract fields. This search identified 368 unique articles not included by Doyle et al. Of these, we excluded those that contained no CAHPS data (n=128), and those that contained

CAHPS data but did not test associations between patient-reported experiences and processes or outcomes of care (n=234). This resulted in an additional 6 articles for review. We located 8 more articles that were not included in the Doyle et al. review or our electronic searches by manually reviewing references from bibliographies of articles from the initial search, or by suggestion of co-authors familiar with the literature. In all, we reviewed results from 34 studies that addressed the associations between patient experiences and other aspects or indicators of health care quality (Figure 1), highlighting consistencies and discrepancies across studies and health care settings, and noting instances in which aspects of study design may influence interpretation of results.

Conceptual Model

According to the Institute of Medicine, core elements of high quality health care are safety, effectiveness, timeliness, efficiency, equity, and patient-centeredness (Institute of Medicine, 2001). "Patient-centered" care is "… respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions" (Institute of Medicine, 2001). Responsiveness to patients' individual needs reflects a respect for human dignity (de Silva & Valentine, 2000).

We use the term 'patient experiences' to refer to any process observable by patients, including subjective experiences (e.g., pain was controlled), objective experiences (e.g., waited more than 15 minutes past appointment time), and observations of physician, nurse or staff behavior (e.g., doctor provided all relevant information). Patient experience reports are distinct from "satisfaction" ratings in that they reflect specific care experiences. Patient experience reports directly measure key aspects of the patient-centeredness of care from the patient's perspective.

Furthermore, some aspects of quality, such as availability of translation services, may be most practically measured by surveying patients. We hypothesize empirical associations between patient experiences and other dimensions of health care quality that arise from both causal pathways and associative, non-causal pathways.

Causal pathways involve patient-reported processes that directly enhance other quality dimensions. For example, better communication may improve information flow to physicians, leading to better diagnosis and treatment planning, and also may improve information flow to patients, enhancing adherence to provider recommendations; together these can lead to greater effectiveness, efficiency, and safety. These pathways are reflected in Figure 1 as "hypothesized causal associations," and are noted with arrows.

We also hypothesize several mechanisms leading to non-causal associations between patient experiences and other aspects of care quality. First, patient experiences may reflect structures and processes that are not directly observable by the patient (nor readily measurable in any other way) but which are important to quality. For example, a patient's report that her doctors were familiar with the facts of her case may reflect effective use of electronic health records. Second, patient experiences and technical quality may be associated due to the influence on both of system characteristics such as expertise of management and adequacy of resources. These associations are shown in Figure 1 as hypothesized associations (i.e., non-causal), and noted with dashed lines.

Considerations Regarding Study Design

Several features of study design are particularly important when interpreting results, given that all studies under review use observational designs. First, associations between patient experience and outcomes may be confounded by characteristics of study subjects that are correlated with patient experience. For example, sicker patients, particularly those near the end of life, may receive more attentive health care, and therefore rate their care experiences more positively, than others (Elliott et al., 2013). Thus, an association between good patient experiences of care and mortality may reflect increased attention to older, sicker, or near-death patients rather than indicate that good communication and attentiveness cause higher mortality. It is important to control for such variables in analyses of relationships between patient care experiences and outcomes of interest. For some studies in our review, complete adjustment for the burden of illness, such as that pursued by Kahn et al. (2007a) in the context of chronic illness care, may have led researchers to different conclusions regarding the relationship between patient care experiences and outcomes than would have been reached in unadjusted analyses. Furthermore, adjusted analyses generally correspond more closely to the official, publicly reported patient experience results released by CMS in quality-based purchasing programs, such as Hospital Value-Based Purchasing. Alternative explanations for findings must be considered in light of these potentially important omitted variables.

Second, to attribute patient experience survey responses to the correct provider or system, surveys must ask patients to focus on care from a particular provider, setting or episode of interest (Daniels, Shaul, Greenberg, & Cleary, 2004; Hargraves, Hays, & Cleary, 2003; Homer et al., 1999; Landon, Zaslavsky, Bernard, Cioffi, & Cleary, 2004). For example, CAHPS survey

materials name the health plan or health care provider that the respondent should think about when responding to survey questions. Surveys that ask patients about experiences over an extended time period with multiple health care providers (e.g., all care received in the past 12 months), rather than one provider or setting (e.g., care received from Dr. Smith), generate responses that reflect an average of experiences with several providers or settings of care. While these survey results may accurately portray the overall quality of the health care received, they may not reflect the care delivered by the provider(s) most responsible for measured outcomes. For example, patient surveys used to assess the association between patients' care experiences and diabetes care processes and outcomes should name the provider responsible for the patient's diabetes management rather than inquiring about all care received in a prior period.

Third, to assess the quality of care experiences delivered by a particular health care provider (i.e., clinician, clinic, hospital, or system), data must be collected from sufficiently large samples of patients reporting about each provider. These provider-level data allow for adequate numbers of responses per provider to reliably describe the provider's performance and average out the effects of patient characteristics on provider scores (Lyratzopoulos et al., 2011; Nelson et al., 2004). Variation among responses of individual patients is typically greater than variation among mean scores of providers. Consequently, analyses of patient survey data that do not include multiple observations per provider may primarily reflect effects of patient characteristics observed (e.g., age and self-reported health status, if not adjusted) and unobserved (e.g., prognosis, personal expectations of care; Elliott et al., 2010), rather than care experiences with a specific provider. Such data cannot be used to accurately assess provider-level associations (i.e., do providers whose patients have good experiences also give good care as measured by clinical quality measures?)."

Fourth, findings regarding the relationship between patient experience and other care processes and outcomes may be highly sensitive to the aspects of patient experience that are measured. For example, a study of Medicare health plan enrollees found a significant and positive association between enrollees' reports regarding health plan information and customer service and most process measures of clinical quality performance; however, overall ratings of health plan care were not consistently associated with process measures (Schneider et al., 2001).

Fifth, all of the reviewed studies are observational, limiting our ability to make causal inferences; however, some studies measure patient experiences and patient behaviors or care processes at the same point in time, while others follow patients longitudinally, examining the association between patients' reported experiences at one time and a set of subsequent outcomes. Longitudinal studies have the potential to provide insight into the role of patient experience on subsequent outcomes, so long as the time lag between measuring care experiences and subsequent outcomes is reasonable, and the analysis or interpretation of results account for other factors that may contribute to both experiences and outcomes.

Results

Patient Behavior

The importance of patient-provider communication for promoting patient adherence to treatment regimens has been extensively documented (Bartlett et al., 1984; Brody et al., 1989; Gordon, Smith, & Dhillon, 2007; Greenfield, Kaplan, & Ware, 1985; Greenfield, Kaplan, Ware, Yano, & Frank, 1988; Inui, Yourtee, & Williamson, 1976; Safran et al., 1998; Zolnierek & Dimatteo, 2009), although the majority of relevant studies assess associations at the patient level, meriting cautious interpretation, especially when unadjusted. Safran et al. (1998) found that better

patient-reported experiences, particularly trust in physicians and belief that physicians had a comprehensive "whole person" knowledge of them, were associated with patients' adherence to physician advice. A 2009 meta-analysis of 127 studies assessing the link between patient treatment adherence and physician-patient communication found a 19% higher risk of non-adherence among patients whose physician communicated poorly, and substantial and significant improvements in adherence among patients whose physicians participated in communication skills training (Zolnierek & Dimatteo, 2009). Better provider communication is positively associated with adherence to hypoglycemic medications among diabetics (Ratanawongsa et al., 2013), better diabetes self-management among veterans (Heisler, Bouknight, Hayward, Smith, & Kerr, 2002), adherence to hypertension medication among African Americans (Schoenthaler et al., 2009), adherence to tamoxifen among breast cancer patients (Kahn, Schneider, Malin, Adams, & Epstein, 2007b; Liu, Malin, Diamant, Thind, & Maly, 2013), higher rates of colorectal cancer screening among adults across the US (Carcaise-Edinboro & Bradley, 2008), general adherence among patients with hypertension, diabetes, or heart disease (Sherbourne, Hays, Ordway, DiMatteo, & Kravitz, 1992), and participation in a range of preventive health screening and health habit counseling services (Flocke, Stange, & Zyzanski, 1998). Trust in physicians has also been shown to be associated with better adherence to diabetes care recommendations (Lee & Lin, 2009) and greater use of a range of preventive services among low-income African American women (O'Malley, Sheppard, Schwartz, & Mandelblatt, 2004).

Clinical Processes

Hospitals with the highest HCAHPS scores perform significantly better on CMS's clinical process of care measures for acute myocardial infarction (AMI), congestive heart failure, pneumonia and surgery than hospitals with the lowest HCAHPS scores (Jha, Orav, Zheng, &

Epstein, 2008). Similarly, patients' overall ratings of their hospitals have been positively associated with hospitals' performance on CMS's process measures for pneumonia, congestive heart failure, AM I and surgical care in the US (Isaac, Zaslavsky, Cleary, & Landon, 2010), and to process indicators relating to 19 different conditions in the UK (Llanwarne, et al., 2013). Overall ratings and willingness to recommend the hospital were lower in hospitals that consistently performed poorly on cardiac process measures over the course of 3 years (Girotra, Cram, & Popescu, 2012). In contrast, Lyu et al. (2013) found no association between performance on surgical process measures and overall hospital ratings, although their study of 31 hospitals had insufficient power to detect statistically significant true correlations as large as 0.4, well within the range of statistically significant correlations found in a similar but larger study (Isaac, et al., 2010).

Findings regarding the associations between outpatients' experience of care and care processes are mixed (Caldis, 2007; Chang et al., 2006; Rao, Clarke, Sanderson, & Hammersley, 2006; Schneider et al., 2001; Sequist et al., 2008); in some instances, this may be due to a mismatch between the provider assessed in the patient survey and the provider responsible for delivering the measured care process. Sequist et al. (2008) found that measures of patient experience, including doctor-patient communication, clinical team interactions and health promotion support, were positively associated with some prevention and disease management clinical process measures in clinical practices and among individual clinicians. Conversely, Chang et al. (2006) found that vulnerable older patients' global ratings of care were not significantly associated with the technical quality of care they received.

Clinical Outcomes

Several studies have examined relationships between patient-reported experiences and clinical outcomes, many focusing on care for AMI (Fenton, Jerant, Bertakis, & Franks, 2012; Fremont et al., 2001; Glickman et al., 2010; Jaipaul & Rosenthal, 2003; Meterko, Wright, Lin, Lowy, & Cleary, 2010; Stewart et al., 2000).

In a prospective study of AMI patients, Meterko et al. (2010) found that, controlling for comorbidity, other clinical and sociodemographic factors, and technical care quality, patient reports of better patient-centered hospital care were significantly associated with better survival one year after discharge for AMI treatment. Similarly, controlling for hospitals' clinical performance, Glickman et al. (2010) found that higher patient ratings of hospitals were independently associated with lower hospital inpatient mortality rates among AMI patients. These studies do not investigate the mechanisms by which patient experiences may influence clinical outcomes; thus, it is possible that an unmeasured third factor accounts for patients having both better care experiences and better clinical outcomes. An alternative explanation is that positive patient experiences provide a unique benefit to clinical outcomes for AMI patients over and above clinical quality performance.

To date, one published study reported a negative relationship between patient experience and outcomes. In a sample of 52,000 adult patients, Fenton et al. found that the patients reporting the best patient-provider communication and overall ratings of care had greater total healthcare and prescription drug expenditures, more inpatient admissions, and higher mortality (Fenton, et al., 2012). These findings may be explained, in part, by the tendency of clinicians to pay more

attention to the needs of patients near the end of life (Elliott, et al., 2013; Xu et al., 2013). In addition, the study assesses the association between patients' use of services and health outcomes with patients' reports of care from any or all providers seen in the past year. Therefore, respondents may have been reporting on a different health care provider than the one most responsible for the health outcomes under study. Without multiple observations per provider, the observed associations may reflect more about patient characteristics than the care they received from providers.

Efficiency

Some aspects of patient-centered care may help to reduce unnecessary health care use. For example, children whose parents report longer waits for primary care visits were more likely to visit the emergency department for non-urgent reasons than those who report shorter waits (Brousseau, Bergholte, & Gorelick, 2004). Children with asthma whose physicians had reviewed a long-term therapeutic plan with parents were less likely to visit an emergency department, make urgent office visits, or be hospitalized (Clark et al., 2008). Adjusting for clinical quality, Boulding et al. (2011) found that patients' overall ratings of hospitals' care and discharge planning were independently associated with lower 30-day readmission rates for AMI, heart failure and pneumonia.

Safety

Reports of positive patient experiences have been associated with lower prevalence of inpatient care complications, particularly decubitus (pressure) ulcers, post-operative respiratory failure, and pulmonary embolism or deep venous thrombosis (Isaac, et al., 2010). Notably, Isaac et al. found that patient-reported cleanliness of the hospital environment was strongly related to lower

prevalence of infections due to medical care in a given hospital. While Saman et al. (2013) did not confirm that finding, their study did find a significant relationship between patient reports of hospital staff responsiveness and decreased likelihood of central line-associated blood stream infections. In addition, hospitals with patients who report more positive experiences tend to have employees with more positive perceptions of patient safety culture (Lyu, et al., 2013; Sorra, Khanna, Dyer, Mardon, & Famolaro, 2012).

Discussion

Our review finds support for the hypothesized positive association between positive care experiences and patient adherence, as well as the resultant influence of adherence on clinical outcomes. In addition, we find support for the hypothesized associations between positive patient experiences and best practice clinical processes, better hospital patient safety culture, and lower unnecessary utilization.

It is important to note that the studies we reviewed reveal no inherent trade-off between strong performance on patient experience indicators and performance on clinical quality measures. Rather, the empirical evidence indicates that it is possible for health care providers and plans to simultaneously offer better patient experiences and better clinical quality, and that positive patient experiences, best practice clinical processes, lower hospital readmissions, and desirable clinical outcomes are often positively associated across provider organizations. We identified just one study out of nearly three dozen that reported a negative correlation between patient experiences and clinical care quality.

Many of the studies we reviewed, however, reported null associations between patients' care experiences and clinical processes or outcomes. Lack of association between patient experience measures and clinical outcomes is not necessarily surprising, as clinical process measures have not been demonstrated to be consistently and positively related even to one another (Jha, Li, Orav, & Epstein, 2005), to clinical outcomes (Morse et al., 2011; Shahian et al., 2012; Werner & Bradlow, 2006) or to lower readmission rates (Stefan et al., 2013). Individual quality indicators may or may not reflect quality of care in other areas (Wilson et al., 2007); hence, health care providers might perform better or worse on measures in the patient experience domain than on clinical process measures. For example, Lehrman et al. (2010) find that the association between HCAHPS and clinical process measures at the hospital level is significantly positive, but weak, reporting that 1 in 12 hospitals were in the top quartile on both HCAHPS and clinical process measures in 2006/2007, while 1 in 6 were superior in HCAHPS only and 1 in 6 were superior in clinical measures only. Similarly, Girotra et al. (2012) found that some hospitals that performed poorly on cardiac process measures received high overall HCAHPS ratings, and vice versa. There is also considerable variation within each quality domain, with some hospitals performing better on cardiac measures than on pneumonia measures, for example (Jha, et al., 2005). From an assessment perspective, variation in performance within a measure set is in fact desirable, as it indicates that each measure is contributing unique information to the total quality score.

Well-developed and standardized patient experience measures complement measures of technical care quality by generating information about aspects of care quality for which patients are the best or only source, such as the degree to which care is respectful and responsive to their needs

(i.e., “patient-centered”). To ensure that patient experience data is actionable for health care providers and meaningful to consumers and patients, surveys should inquire about specific care experiences, such as whether nurses and doctors listened carefully, rather than overall satisfaction, which is highly subjective (Cleary 1998; Cleary et al., 1998).

Improving the infrastructure and processes for certain aspects of care may result in broader improvements because common characteristics of the system can influence a broad range of outcomes (Berwick, 1996; Nolan, 1998). Thus, quality improvement efforts aimed at enhancing patient experiences may also benefit clinical quality. Providing patient-centered care need not divert resources away from other high priority quality improvement efforts, since initiatives to improve patient-centeredness can be both low cost and high value (Cosgrove et al., 2013). A growing body of literature finds that provision of patient-centered care is associated with less diagnostic testing and specialty referral, fewer hospitalizations and readmissions, and lower costs (Bertakis & Azari, 2011; Boulding, et al., 2011; Epstein et al., 2005; Stewart et al., 2000).

Conclusion

Like all quality measures, patient experience measures should be collected using psychometrically sound instruments, employing recommended sample sizes and adjustment procedures, following standardized implementation protocols, and subjected to continual oversight. Under these conditions, the literature suggests that patient experience measures are an appropriate complement to clinical quality measures.

Patient-centered care is a critical aspect of care quality. Measuring patient experiences of care may help to promote accountability and quality improvement efforts targeted at patient-centeredness (Luxford, 2012). Surveys of patient experience directly evaluate the degree to which care is patient-centered, and thus capture an intrinsically important dimension of care quality, regardless of the correlation between patient experience and other indicators of health care quality. In addition to the intrinsic value of measuring care quality from the patient's perspective, our review finds that better patient care experiences are associated with higher levels of adherence to recommended prevention and treatment processes; better clinical outcomes, particularly in the inpatient setting; better patient safety culture within hospitals; and less health care utilization.

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Table 1. Evidence for associations between patient-reported experiences and other aspects of health care quality.

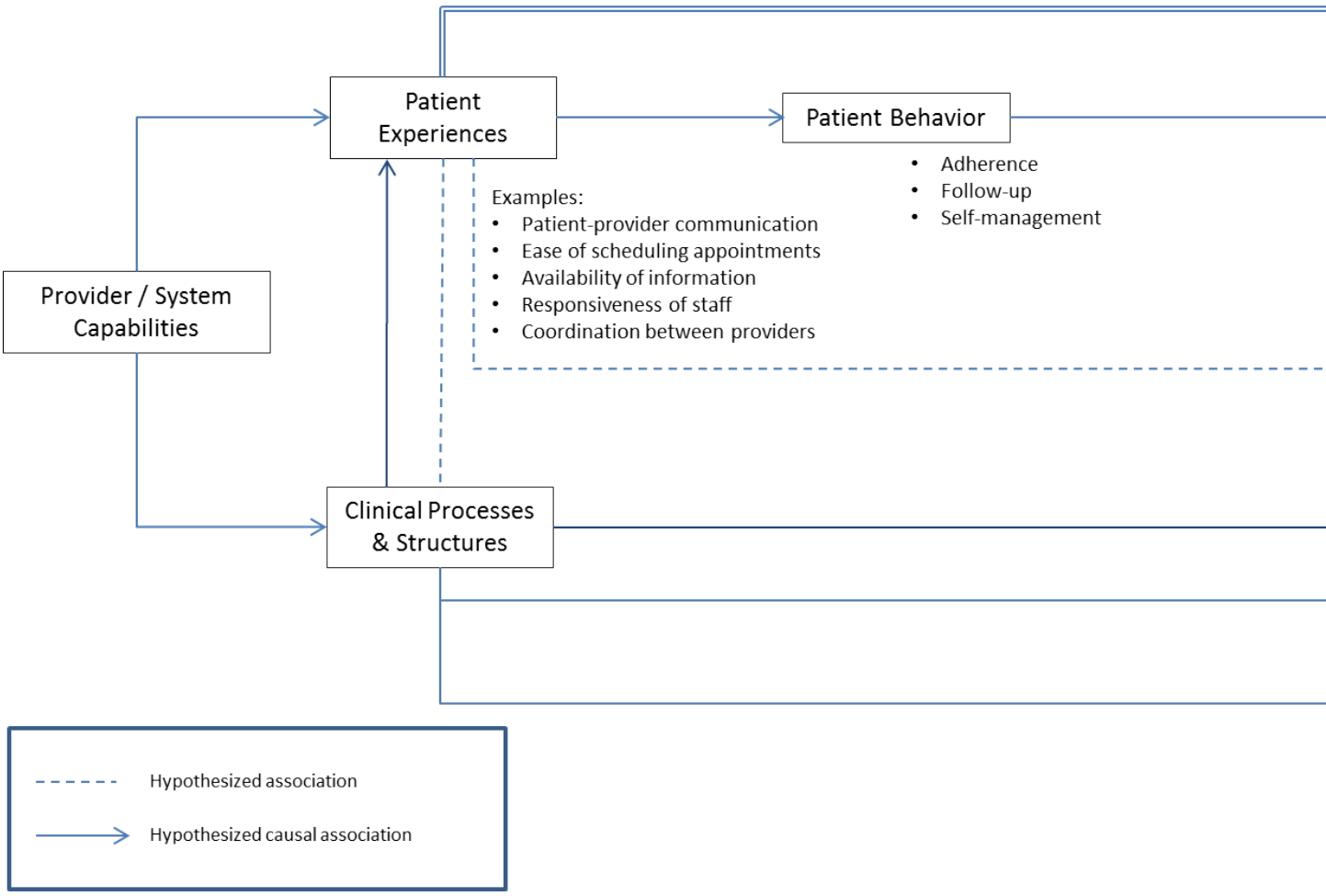
Patient Experience	**Patient Behavior** (Adherence, Follow-Up, Self-Management)	**Clinical Processes and Structures**	**Effectiveness** (Outcomes)	**Efficie** (Utilizat

Domain				
Overall rating / summary score		Schneider et al., 2001 Chang et al., 2006 Jha et al., 2008 Glickman et al., 2010 Isaac et al., 2010 Girotra, et al., 2012 Llanwarne, et al., 2013	Fremont et al., 2001 Jaipaul & Rosenthal, 2003 Glickman et al., 2010 Meterko et al., 2010 Boulding et al., 2011	Little et al. (Gary, et al 2005)
Willingness to recommend provider		Isaac et al., 2010 Girotra, et al., 2012		
Patient-provider communication	Sherbourne, et al., 1992 Flocke et al., 1998 Carcaise-Edinboro & Bradley, 2008 Heisler et al., 2002 Kahn et al., 2007b Liu et al., 2013 Schoenthaler et al., 2009 Ratanawongsa et al., 2013	Flocke et al., 1998 Schneider et al., 2001 Rao et al., 2006 Sequist et al., 2008 Isaac et al., 2010 Llanwarne, et al., 2013	Safran et al., 1998 (Fenton et al., 2012)	Little et al. Gary, et al. Clark et al. Fenton et a 2012
Shared decision-making	Heisler et al., 2002 Kahn et al., 2007b Ratanawongsa et al., 2013			
Care coordination	Flocke et al., 1998		Jaipaul & Rosenthal, 2003	
Health promotion		Sequist et al., 2008		Little et al.
Trust in provider	Safran et al., 1998 O'Malley et al., 2004 Lee & Lin, 2009 Ratanawongsa, et al., 2013	Rao et al., 2006		
Getting needed care		Schneider et al., 2001		Gary, et al.
Getting care quickly		Schneider et al., 2001 Llanwarne, et al., 2013		Brousseau, 2004)
Health plan information and customer service		Schneider et al., 2001		
Courtesy, respect, and/or helpfulness of office staff		Schneider et al., 2001 Rao et al., 2006		Gary, et al.
Clean hospital environment		Isaac et al., 2010		

Responsiveness of medical staff		Isaac et al., 2010		
Discharge information		Isaac et al., 2010	Jaipaul & Rosenthal, 2003 Boulding et al., 2011	

Note: Underline indicates positive association, regular font no or mixed association, and (parentheses) negative association between the indicator of patient experience and other aspects of health care quality.

Figure 1. Conceptual Model:
Pathways by Which Patient Experiences May be Associated with Health Care Q
Providers and Systems.



Appendix – Table A1. Description of Reviewed Studies.

Study	**Study Design**	**Sample Size & Setting**	**Measures of Patient Experience** *(Survey instrument name, when applicable)*	**Measures of Other Aspects of Health Care Quality**	**Results Summary**
Boulding, et al., 2011	Cross-sectional	1,798 + hospitals, USA	Overall satisfaction score, including overall rating of hospital and willingness to recommend hospital Overall discharge satisfaction, including communication about help needed after hospital discharge and information about symptoms or health problems post-discharge *(HCAHPS)*	Clinical performance, measured by guideline adherence scores for acute myocardial infarction (AMI), heart failure, and pneumonia Hospital-level 30-day risk-standardized readmission rates	Controlling for clinical performance, better overall patient-reported experiences scores were significantly associated with lower 30-day risk-standardized readmission rates for all 3 clinical conditions.
Brousseau, et al., 2004	Case-control	719 parents of children presenting to the emergency department, Wisconsin, USA	Getting care without long waits (4 items) *(CAHPS)*	Non-urgent visitation of the emergency department	In adjusted analyses, parent-reported ability to get care without long waits was significantly associated with decreased odds of non-urgent use of the emergency department.
Carcaise-Edinboro & Bradley, 2008	Cross-sectional	8,488 adults age 50+, USA	Patient-provider communication	Receipt of colorectal cancer screening	In adjusted analyses, better patient-provider communication reports

			(CAHPS measures on MEPS survey)		were associated with higher rates of colorectal cancer screening.
Chang, et al., 2006	Cross-sectional	236 community-dwelling vulnerable adults age 65+ in 2 managed care organizations, USA	Global rating of health care *(CAHPS)*	Overall technical care quality measured as the proportion of care processes received for all indicators for which the patient was eligible (maximum: 207) *(Accessing Care of Vulnerable Elders; ACOVE)*	In adjusted analyses, global rating of care was not significantly associated with technical care processes.
Clark, et al., 2008	Cross-sectional	452 parents of children age 2 to 12 with asthma, USA	Physician communication, including using interactive conversation, review of short-term goals	Number of emergency department visits, hospitalizations, urgent office visits for asthma in the prior 12 months	In adjusted analyses, four of 10 aspects of physician communication were associated with significantly fewer office visits in the prior year; two aspects (reviewing the long-term plan and tailoring the medication regimen) were associated with significantly fewer ED visits.
Fenton, et al., 2012	Prospective observational cohort	51,946 adults, USA	Overall rating of providers' care and provider communication items, including how often provider(s) listened carefully; explained	Health care utilization, including any emergency department visits and any inpatient admissions Mortality	In adjusted analyses, respondents in the highest quartile for overall ratings of care were less likely to visit the emergency

			things in a way that was easy to understand; showed respect for what they had to say; spent enough time *(CAHPS measures on MEPS survey)*		department, more likely to have an inpatient admission, and had a greater mortality risk than those in the lowest quartile of care ratings.
Flocke, et al., 1998	Cross-sectional	2,889 patients of primary care physicians, Ohio, USA	Patient-reported domains of primary care including: • Interpersonal communication • Physician's accumulated knowledge about patient • Coordination of care *(Components of Primary Care Instrument; CPCI)*	Three categories of preventive services: • Screening, including blood pressure measurement, eye exams, cholesterol, Pap tests, lead • Health habit counseling, such as advice about exercise and tobacco • Immunization services, including flu, polio and tetanus	In adjusted analyses, interpersonal communication and coordination of care were significantly associated with the delivery of preventive screening services and being up to date on health habit counseling services, but not significantly associated with immunization behavior.
Fremont, et al., 2001	Prospective observational cohort	2,272 AMI patients, New Hampshire, US	Problem scores based on domains of patient-centered care related to hospitalization (at 1 month following discharge) and ambulatory care (at 3 months following	Cardiac symptoms using London School of Hygiene measures Functional health status at 1 and 12 months following discharge, including self-reported general health,	In adjusted analyses, patients reporting more problems with patient-centered care during hospitalization reported worse overall and physical health, and more cardiac symptoms

			discharge: • Respect for patient preferences • Coordination of care • Information and education • Physical comfort • Emotional support • Involvement of family and friends • Continuity • Transition *(Picker Patient Experience questionnaire, inpatient)*	and mental and physical functioning scales	at 12 months post-discharge than those with better reports of patient-centered care; these associations were attenuated by better reported ambulatory care experiences.
Fuertes, Boylan, & Fontanella, 2009	Cross-sectional	154 adult neurology outpatients, New York City, USA	• Physician-Patient Working Alliance scale • Physician Empathy Questionnaire • Physician Multicultural Competence Questionnaire	General adherence measure	Patient adherence to treatment was not significantly associated with patient-reported working alliance between physician and patient, or physician empathy, but was significantly associated with physician multicultural competence.
Gary, et al., 2005	Prospective observational cohort	542 African Americans age 25+ with type 2 diabetes, Baltimore, USA	Five domains: • Getting care • How well doctors and nurses communicate • Courtesy, respect,	Number of emergency room visits in the 12 months following baseline visit assessed with CAHPS	In adjusted analyses, there were inconsistent relationships between patient experience reports and ratings and emergency room

			and helpfulness of office staff • Ratings of personal doctor • Overall health care *(CAHPS)*		attendance in the 12 months following a baseline visit.
Girotra, et al., 2012	Cross-sectional	2,467 + hospitals, USA	Overall patient ratings of hospital care and willingness to recommend hospital *(HCAHPS)*	Clinical process measures for AMI and heart failure	In adjusted analyses, hospitals that consistently performed poorly on cardiac process measures received poor patient overall ratings. Overall, process measure performance was not highly correlated to patient ratings.
Glickman, et al., 2010	Cross-sectional	25 hospitals serving AMI patients, USA	Overall patient assessment of care, including staff worked together well; likelihood of recommending hospital; overall rating of hospital care	Hospital adherence to clinical guidelines for AMI treatment Inpatient mortality, adjusted for patient risk score	Higher overall ratings of care were associated with significantly higher hospital adherence to clinical guidelines. Controlling for hospitals' adherence to clinical guidelines, higher overall ratings were associated with lower hospital-level risk-adjusted inpatient mortality.
Heisler, et al., 2002	Cross-sectional	1,314 veterans with diabetes,	Provider participatory decision making and	Overall diabetes self-management, including 5	In adjusted analyses, higher patient ratings of

		USA	provider communication	domains: medication, diet, exercise, blood glucose monitoring, foot care	provider participatory decision making and communication were significantly associated with better patient self-management of diabetes.
Isaac, Zaslavsky, Cleary, & Landon, 2010	Cross-sectional	927 hospitals, USA	Overall rating of hospital and willingness to recommend hospital, as well: • Communication with doctors • Communication with nurses • Communication about medications • Pain management • Clean and quiet hospital environment • Responsiveness of medical staff • Discharge information *(HCAHPS)*	Ten core process of care measures related to AMI, congestive heart failure, pneumonia, and surgery. Medical and AHRQ surgical Patient Safety Indicators	Overall hospital ratings, willingness to recommend the hospital, and receipt of discharge information were significantly associated with better adherence to medical and surgical process of care measures. Better patient experiences for each measure domain were associated with lower decubitus ulcer rates.
Jaipaul & Rosenthal, 2003	Cross-sectional	29 hospitals, Ohio, USA	Overall rating, and 5 scales, including: • Physician care • Nursing care • Information provided • Discharge instructions • Coordination of care	Severity-adjusted mortality rates for patients with 6 high-volume medical diagnoses: AMI; congestive heart failure; obstructive airway disease; gastrointestinal hemorrhage; pneumonia;	In adjusted analyses, hospitals with higher patient ratings tended to have lower severity-adjusted mortality.

			(Patient Judgment System)	and stroke	
Jha, Orav, Zheng, & Epstein, 2008	Cross-sectional	2,429 hospitals, USA	Overall rating of hospital and willingness to recommend hospital, as well as domains: • Communication with doctors • Communication with nurses • Nursing services / responsiveness of medical staff • Communication about medications • Pain management • Clean and quiet hospital environment • Discharge information *(HCAHPS)*	Twenty-four process of care measures, aggregated into composites for AMI, congestive heart failure, pneumonia, and surgery.	Hospitals with higher overall patient care experience ratings were significantly more likely to adhere to recommended processes of care for AMI, congestive heart failure, pneumonia, and surgery.
Kahn, et al., 2007b	Prospective observational cohort	881 patients with stage I-III breast cancer	Cancer treatment support from health care providers Role in decision-making regarding tamoxifen Provider-patient communication in previous 12 months	Tamoxifen continuation 4 years after diagnosis	In adjusted analyses, ongoing tamoxifen use was higher among patients reporting receipt of adequate health care provider support and role in decision-making, as well as among those with better reported provider communication in the prior 12 months.

			(Adapted from CAHPS)		
Lee & Lin, 2009	Cross-sectional	280 patients with type 2 diabetes at 3 medical facilities, Taiwan	Trust in the physician on 11 item scale	Adherence to diabetes self-management behaviors on Disease-Specific Adherence Scale *(Medical Outcomes Study)*	In adjusted analyses, patients reporting more trust in their physicians were more likely to adhere to their diabetes regimens.
Little et al., 2001	Prospective observational cohort	865 patients in 3 general practices, UK	• Doctor-patient communication & partnership (doctor-patient) • Personal relationship (doctor-patient) • Health promotion • Positive and clear approach to (health) problem • Interest in effect of (health problem) on (patient's) life • Overall satisfaction with consultation	Use of health services, including re-attendance, investigation, and referral	Domains of patient experience were not associated with re-attendance or investigations; in adjusted analyses, referrals were less likely among patients who reported that they had a personal relationship with their doctor.
Liu, et al., 2013	Prospective observational cohort	303 women with stage I–III breast cancer who initiated hormone treatment, California, USA	Self-reported provider-patient communication at 18 months following diagnosis, including medical oncologist listened carefully to you; explained things in a way you could understand; showed respect for what you had to say;	Hormone therapy use at 36 months following diagnosis	In adjusted analyses, better self-reported patient-centered communication by oncologists at 18 months post-diagnosis positively predicted ongoing use of hormone therapy at 36 months after breast cancer diagnosis.

			spent enough time with you		
Llanwarne, et al., 2013	Cross-sectional	7,759 family practices, UK	Overall satisfaction, as well as 16 other measures of patient experience, including: telephone access, availability of urgent appointments, ability to book ahead, ability to see preferred doctor, doctor and nurse communication, and items related to care planning *(General Practice Patient Survey (GPPS))*	Clinical quality measures from the national pay-for-performance Quality and Outcomes Framework, which include 89 indicators, largely of care processes, related to 19 different conditions.	Clinical quality summary scores and patient survey scores were positively and significantly correlated; however, the strength of the associations was weak.
Lyu, et al., 2013	Cross-sectional	31 hospitals, USA	Overall rating of hospital care *(HCAHPS)*	Six domains of safety attitudes reported by hospital staff, including teamwork climate, safety climate, job satisfaction, working conditions, perceptions of facility and local management Surgical care process measures, including: outpatient and inpatient antibiotic prophylaxis, hair removal, Foley catheter	Patient overall hospital ratings were not associated with hospitals' adherence to surgical care process measures. Patient overall ratings were positively correlated with hospital staffs' teamwork and safety climate scores.

				removal, and deep vein thrombosis prophylaxis	
Meterko, Wright, Lin, Lowy, & Cleary, 2010	Prospective observational cohort	1,858 AMI patients, USA	Patient-centered care index calculated as average of 9 domains of inpatient experience: • Access • Courtesy • Information about illness/care • Coordination of care • Attention to patient preferences • Emotional support • Family involvement • Physical comfort • Preparation for transition to outpatient care *(VA Survey of Healthcare Experiences of Patients, based on Picker Institute Patient Experience Questionnaire)*	Survival 1-year postdischarge	Controlling for technical quality of care and patient characteristics, better patient-centered care index was associated with slightly but significantly lower mortality at 1 year after discharge.
O'Malley, et al., 2004	Cross-sectional	961 African-American women age >40, District of Columbia, USA	Overall trust in one's regular primary care provider Trust that the regular provider had no financial conflict of interest	Index summarizing self-reported participation in the following preventive health interventions delivered by primary care provider: mammography, Pap tests, clinical breast	Controlling for insurance status, primary care, and patient characteristics, higher trust was significantly associated with greater use of recommended

				exams, colorectal cancer screening, blood pressure, height and weight measurement, diet counseling, and depression screening	preventive services.
Rao, Clarke, Sanderson, & Hammersley, 2006	Cross-sectional.	3,487 individuals aged 65+ at general practices, UK	Weighted index of nine domains of patient-assessed quality: • Access to practice • Satisfaction with receptionists • Satisfaction with continuity of care • Satisfaction with communication • Satisfaction with interpersonal care • Trust in general practitioner • General practitioner's knowledge • Satisfaction with practice nursing • Satisfaction with technical care *(General Practice Assessment Survey)*	Three measures of technical care quality: Blood pressure monitored Blood pressure controlled Influenza vaccine administered	No significant association between domains of patient-assessed quality and technical quality of care measures.
Ratanawongsa, et al., 2013	Cross-sectional	9,377 diabetes patients, California, USA	Patient-provider communication, including how often provider listened carefully; explained	Poor refill adherence measured by the continuous medication gap	Compared with patients offering higher ratings, patients who gave lower ratings for health care providers' involving

			things in a way you could understand; showed respect for what you had to say; spent enough time *(CAHPS)* Shared decision making, including how often personal physician involved you in making decisions about your care as much you wanted; seemed to understand the kinds of problems you have in carrying out recommended treatments *(Interpersonal Processes of Care Instrument)* Trust, including how often you felt confidence and trust in personal physician; felt that personal physician was putting your medical needs above all other considerations when treating your medical problems *(Trust in Physicians Survey)*		patients in decisions, understanding patients' problems with treatment, and eliciting confidence and trust were more likely to have poor secondary adherence to cardiometabolic medications.
Safran et al.,	Cross-	7,204 adults,	7 patient-reported	Adherence to physician	Patient-reported trust in

1998	sectional	Massachusetts, USA	domains, including accessibility, continuity, comprehensiveness, integration, clinical interaction, interpersonal treatment, and trust *(Primary Care Assessment Survey)*	advice Improved health status	physicians and belief that physicians had a comprehensive "whole person" knowledge of them, were associated with patients' adherence to physician advice. These factors, as well as integration of care and communication, were associated with improvements in health status.
Saman et al., 2013	Cross-sectional	1,987 acute care hospitals, USA	Patient-reported hospital room cleanliness, hospital staff responsiveness, and nurse communication *(HCAHPS)*	Central line-associated blood stream infections (CLABSIs) reported to the National Healthcare Safety Network (standardized by hospital central line volume)	In adjusted analyses, the proportion of patients who reported that they ''sometimes'' or ''never'' received help as soon as they wanted was significantly associated with an increased risk for CLABSIs. Patient-reported hospital room cleanliness and nurse communication were not significantly associated with CLABSI rate.
Schneider et al., 2001	Cross-sectional	233 Medicare health plans	Overall rating of health plan care and five composites: • Getting needed care • Getting care quickly • Communication with	Six care process measures quality: • Mammography screening • Annual eye exams for diabetics	Getting needed care and health plan information and customer service were significantly associated with most process measures of

			doctors • Courtesy, respect, helpfulness of office staff • Health plan information and customer service *(CAHPS)*	• Beta-blockers for myocardial infarction • LDL cholesterol tests for those with cardiovascular events • Contact with a mental health professional at 7 days, and at 30 days post-discharge for those with mental health inpatient stay • Continuation of antidepressant medications after initiation of treatment	clinical quality performance. Overall ratings of health plan care not consistently associated with process measures.
Schoenthaler, et al., 2009	Cross-sectional	439 African American patients with poorly controlled hypertension from community-based practices, New York, USA	Composite of 13 questions regarding of provider communication, including friendliness of doctor; doctor asked about questions and concerns; written information about medication given to patients; scheduled follow-up appointment	Self-reported adherence to blood pressure medication	Controlling for patient demographics, depressive symptoms, and provider training, patients who rated their providers' communication to be more collaborative were significantly more likely to report better medication adherence than patients who rated their provider's communication as non-collaborative.
Sequist, et al., 2008	Cross-sectional	373 practice sites and 119 individual	Seven composites: • Doctor/patient communication	Two process of care composites (prevention, including cancer and	Most patient experience composites were positively correlated

		primary care physicians, Massachusetts, USA	• Clinical team interactions • Health promotion support • Integration of care • Office staff • Visit-based continuity • Organizational access *(Ambulatory Care Experiences Survey)*	chlamydia screenings; disease management, including cholesterol screening, appropriate asthma medications, diabetes care)	with process of care composites; however, few of these positive correlations were statistically significant.
Sherbourne, et al., 1992	Prospective observational cohort	1,198 patients, USA	12-item measure of patient's satisfaction with doctor's communication skills and interpersonal style	Patients' self-reported: • Typical or general tendency to adhere to medical recommendations • Disease-specific adherence for diabetics, hypertensives, heart disease patients	In adjusted analyses, patient satisfaction with interpersonal aspects of health care was associated with general adherence to medical recommendations.
Sorra, et al., 2012	Cross-sectional	73 hospitals, USA	Overall rating of hospital and willingness to recommend, as well as overall average of 7 composite scores *(HCAHPS)*	Overall staff-reported patient safety grade and number of events reported in past 12 months, as well as 12 hospital safety composite scores, including: • Teamwork within units • Supervisor/manager expectations and actions promoting patient safety • Nonpunitive response	Higher hospital safety composite average scores were associated with higher overall HCAHPS composite average scores. However, none of the hospital safety measures were significantly correlated with patients' overall hospital ratings or willingness to recommend.

				to error • Handoffs and transitions	
Stewart, et al., 2000	Prospective observational cohort	315 patients of family physicians, Ontario, Canada	Patient perception of patient centeredness Patient perception that the illness experience has been explored Patient perception that the patient and physician found common ground	Measures of patient health status and utilization 2 months following the initial physician encounter: • Self-reported recovery from discomfort and concerns presented at the encounter • Medical resource use: # of visits, diagnostic tests and referrals	In adjusted analyses, patients' perceptions that their physician encounters were patient-centered were associated with better recovery from discomfort, and fewer diagnostic tests and referrals, but were not associated with fewer visits.