Relationship Between Patient Satisfaction And Physician Characteristics

J Gene Chen, MD, MHS¹,², Baiming Zou, PhD³, and Jonathan Shuster, PhD⁴

Abstract

Background: Physician care influences patient satisfaction. Inherent physician attributes may also affect scores. Objective: To determine the relationship between physician characteristics and patient satisfaction regarding physician care and communication. Method: Observational retrospective study. We examined patient satisfaction surveys from inpatient adults across 9 questions (HCAHPS: Courtesy, Listen, and Explain; Press Ganey: Time, Concern, Informed, Friendliness, Skill, Rating) in relation to physician gender, age, ethnicity, race, and specialty. Results: We analyzed 51,896 surveys on 914 physicians. In univariate analysis, males were rated significantly more often in the highest category (top box) compared to females on Informed and Skill, and whites were rated in the top box more often than nonwhites on all questions. In multivariate analysis, there were no significant associations between ratings and physician gender, ethnicity, and race. On all questions, the odds of being rated in the top box were highest for obstetricians, second highest for surgeons, and lowest for medicine providers. On the question of Skill, the odds of being rated in the top box were higher with increasing age. Conclusion: Patient satisfaction regarding physicians is associated with physician specialty and age.

Keywords
patient satisfaction, HCAHPS, clinician–patient relationship, health-care planning or policy, leadership

Introduction

Patient-centered care is a key component of health-care quality (1). In the United States, the Centers for Medicare and Medicaid Services (CMS) publicly report results of patient satisfaction regarding hospital care on the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey (2). In addition, ratings of physicians on online websites are increasing in prevalence (3), and 59% of survey respondents in a US poll reported physician rating sites to be “somewhat important” or “very important” when choosing a physician (4).

However, the relationship between patient satisfaction and clinical outcomes remains unclear. Some studies show that patient satisfaction correlates positively with clinical outcomes (4-8), while others show no correlation or an inverse correlation (9-12). These contradictory data suggest that there are contributors to patient satisfaction other than the quality of care received.

Physicians play a large role in patient satisfaction since they lead the health-care team, offer diagnosis and treatment, and communicate with patients regularly (13). To date, no one has examined if patient satisfaction is related to physician characteristics. The objective of this study was to investigate the relationship between patient satisfaction regarding care and communication and physician attributes.

Methods

Design

This study was an observational retrospective study of patient satisfaction survey results from adults admitted to inpatient services in our hospital system. The Arnold Palmer

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that were filled out completely were included in the analysis. Designates this highest category as “top box”. Only surveys Consumer Assessment of Healthcare Providers and Systems reports HCAHPS data nationally in this manner. Hospital results skewed toward positive survey answers and (2) CMS all other answers because (1) the distribution of survey HCAHPS, “Very Good” for Press Ganey) in comparison to answers marked in the highest category (“Always” for physician gender, age, ethnicity, race, and specialty. We chose to analyze and Press Ganey questions in relation to physician gender, ethnicity were Hispanic (or Latino) and non-Hispanic, and possibilities for race were white, black or African American, American Indian or Native American, Asian, Native Hawaiian or other Pacific Islander, and some other race. We intentionally did not provide any instructions prior to the task, and the assigners were blinded to the survey results. If 2 or more assigners agreed on ethnicity or race, that ethnicity or race was assigned to the physician; if all 3 disagreed, then fourth and fifth assigners were the tie-breakers. If a physician did not have an associated picture, neither ethnicity nor race was assigned.

Medical Center Institutional Review Board determined that the study did not meet the definition of human participant research and was therefore exempt from review.

**Setting**

Our organization is a not-for-profit, multihospital system in a major metropolitan area and includes the regional level-1 trauma center. Two weeks after the discharge, patient satisfaction surveys regarding the hospital stay are sent by e-mail to patients discharged from our inpatient medical, surgical, and maternity care service lines. Surveys evaluate physicians, nurses, the hospital environment, and the hospital experience. The physician credited with the survey results is the attending physician at the time of discharge. The name of the physician does not appear in the cover letter or survey itself.

**Outcomes**

We collected survey data from September 2010 to March 2016. We focused on questions regarding physician care and communication. Three questions (Courtesy, Listen, and Explain) were derived from the HCAHPS survey, the US national standard for reporting hospital patient experience, and 6 (Time, Concern, Informed, Friendliness, Skill, and Rating) were derived from Press Ganey, a US-based patient experience research organization (Table 1). Outcome measures were patient satisfaction scores across the HCAHPS and Press Ganey questions in relation to physician gender, age, ethnicity, race, and specialty. We chose to analyze answers marked in the highest category (“Always” for HCAHPS, “Very Good” for Press Ganey) in comparison to all other answers because (1) the distribution of survey results skewed toward positive survey answers and (2) CMS reports HCAHPS data nationally in this manner. Hospital Consumer Assessment of Healthcare Providers and Systems designates this highest category as “top box”. Only surveys that were filled out completely were included in the analysis.

**Statistical Analysis**

Demographics were reported for physicians as numbers and percentages for all variables except age, which was reported as mean and standard deviation. Agreements on 3 selected pairs of reviewers of physician race and ethnicity were obtained. Univariate and multivariate methods were based on binary variables for “Always” versus all other responses for HCAHPS questions and “Very Good” versus all other responses for Press Ganey questions. All independent variables were thus binary. For each physician, we obtained his or her success rate as the fraction with “Always” or “Very Good” on the measure of interest. For univariate analysis, we used weighted least squares with weights proportional to the physician’s personal sample size and no intercept term to obtain an overall rate and standard error within each of the positives and negatives for each independent variable.

**Table 1. Patient Satisfaction Survey Questions.**

| Source       | Question                                                                 | Abbreviation | Possible Answers                      |
|--------------|--------------------------------------------------------------------------|--------------|---------------------------------------|
| HCAHPS       | During this hospital stay, how often did doctors treat you with courtesy and respect? | Courtesy     | Never, sometimes, usually, always     |
| HCAHPS       | During this hospital stay, how often did doctors listen carefully to you? | Listen       | Never, sometimes, usually, always     |
| HCAHPS       | During this hospital stay, how often did doctors explain things in a way you could understand? | Explain      | Never, sometimes, usually, always     |
| Press Ganey  | Time physician spent with you                                            | Time         | Very poor, poor, fair, good, very good |
| Press Ganey  | Physician’s concern for your questions and worries                       | Concern      | Very poor, poor, fair, good, very good |
| Press Ganey  | How well physician kept you informed                                     | Informed     | Very poor, poor, fair, good, very good |
| Press Ganey  | Friendliness / courtesy of physician                                     | Friendliness | Very poor, poor, fair, good, very good |
| Press Ganey  | Skill of physician                                                       | Skill        | Very poor, poor, fair, good, very good |
| Press Ganey  | Your rating of the hospitalian*                                          | Rating       | Very poor, poor, fair, good, very good |

*The survey was worded in this manner, regardless of the specialty or practice location of the physician.
Specifically, for physician \(i\), who contributes \(N_i\) surveys, with \(Y_i\) of these top box, we fit the linear model \(Y_i = \beta N_i + \epsilon_i\). The weighted least squares estimate is \(\bar{Y} = \sum Y_i / \sum N_i\), which is the fraction of all surveys in the group in question that are rated as top box, the same estimate one would get if repeated measures by physician was ignored. However, the error properties take clustering by physician into account.

The comparison for positive versus negative was conducted by obtaining the \(z\) score for the difference between 2 independent estimates, which yielded point estimates, 95% confidence limits, and \(P\) values for the differences. For multivariate analysis, we fit mixed-effects logistic regression models for different outcomes by adjusting all the covariates available, including a class variable for the physician to account for clustering of responses and to regard each physician as a cluster. All covariates were at the physician level, as patient data were restricted to the survey results. \(P < .05\) was considered statistically significant.

### Results

In total, 51,896 complete surveys on 914 physicians were included in the analysis. Response rates varied from 10% to 27% depending on the facility.

Physician demographics are portrayed in Table 2. In total, 3 assigners ascribed ethnicity and race to 854 (93.4%) physicians. For race, 37 (4.3%) required a fourth assigner and 3 (0.4%) required a fifth assigner. For ethnicity, simple \(\kappa\) coefficients between each pair of assigners were 0.53 (95% confidence interval [CI]: 0.45-0.60), 0.56 (95% CI: 0.49-0.63), and 0.65 (95% CI: 0.58-0.72). For race, simple \(\kappa\) coefficients between each pair of assigners were 0.47 (95% CI: 0.43-0.50), 0.48 (95% CI: 0.44-0.51), and 0.82 (95% CI: 0.78-0.86). When race was collapsed into white and non-white, simple \(\kappa\) coefficients between each pair of assigners were 0.81 (95% CI: 0.77-0.86), 0.87 (95% CI: 0.84-0.90), and 0.77 (95% CI: 0.73-0.82).

Survey results by physician gender, age, ethnicity, race, and specialty are portrayed in Table 3. In univariate analysis, males were rated more often in the top box compared to females on Informed, with a difference of 1.7% (95% CI: 0.1%-3.3%, \(P = .039\)) and Skill, with a difference of 2.4% (95% CI: 0.9%-3.9%, \(P = .002\)). Survey results increased as age increased for almost all questions but most particularly for Skill (age >60 years compared to others—difference 3.9%, 95% CI: 2.3%-5.6%, \(P < .001\)). There were no significant differences in top-box percentages between ethnicities. White physicians were rated in the top box more often than nonwhite physicians across all questions, with a range of differences from 2.6% for Courtesy (95% CI: 1.7%-3.6%) to 5.5% for Skill (95% CI: 4.0%-6.9%; \(P < .001\) all comparisons). Obstetricians, surgeons, and other physicians were rated in the top box more often than medicine physicians, with a range of 6.6% (95% CI: 5.8%-7.3%) for Courtesy to 13.6% (95% CI: 12.5%-14.7%) for Skill (\(P < .001\) all comparisons).

The multivariate analysis is presented in Table 4. There were no significant associations between top-box ratings and physician gender, ethnicity, or race on all questions. On HCAHPS questions, the odds of being rated in the top box were highest for obstetricians (adjusted odds ratio [aOR] for Courtesy 1.99, 95% CI: 1.78-2.22; Listen 2.36, 95% CI: 2.14-2.60; Explain 2.71, 95% CI: 2.47-2.97), second highest for surgeons (Courtesy 1.61, 95% CI: 1.45-1.79; Listen 1.58, 95% CI: 1.44-1.73; Explain 1.63, 95% CI: 1.49-1.78), and lowest for medicine providers (reference 1; \(P < .001\) all comparisons). For Press Ganey questions, findings were similar to the exception of Skill, in which surgeons were rated in the top box more often (surgery aOR 1.94, 95% CI: 1.76-2.15; Obstetrics 1.84, 95% CI: 1.66-2.03; \(P < .001\) all comparisons). On the question of Skill, the odds of being rated in the top box were higher with increasing age (aOR 1.05, 95% CI: 1.01-1.09, \(P = .03\)).

### Discussion

In this study, we demonstrate that patient satisfaction among inpatient adults regarding physician communication and care is associated with physician specialty and age. This is the first study to show that patient satisfaction ratings of physicians are related to inherent physician characteristics. Overall patient experience concerning doctors, nurses, the hospital environment, the hospital experience, and discharge process is a complex construct. Previous literature has shown that higher general patient satisfaction is correlated with patient characteristics such as female gender (15), older age (15), language concordance (16), lower level of disability (17), higher degree of chronic illness (18), hospital stay attributes such as the patient being admitted electively rather
Table 3. Univariate Analysis of Patient Satisfaction Top-Box Scores Versus Physician Characteristics.

|                        | Courtesy | Listen | Explain | Time | Concern | Informed | Friendliness | Skill | Rating |
|------------------------|----------|--------|---------|------|---------|----------|--------------|-------|--------|
| Overall top-box percentage | 87.2%    | 79.8%  | 77.1%   | 51.8%| 61.4%   | 60.9%    | 69.8%        | 74.3%| 69.5%  |
| Gender                 |          |        |         |      |         |          |              |       |        |
| Male                   | 87.4%    | 79.9%  | 77.2%   | 52.1%| 61.7%   | 61.4%    | 69.8%        | 75.0%| 69.5%  |
| Female                 | 86.7%    | 79.4%  | 77.0%   | 51.3%| 61.0%   | 59.7%    | 69.6%        | 72.5%| 69.6%  |
| Difference (95% CI)    | .7%      | .8%    | .7%     | .7%  | .8%     | 0.2%     | 0.9%         | 1.7% | -0.2%  |
| P value                | .13      | .45    | .77     | .35  | .40     | .04      | .75          | .00  | .82    |
| Age, years             |          |        |         |      |         |          |              |       |        |
| Less than 39           | 86.0%    | 78.3%  | 75.4%   | 50.6%| 60.3%   | 59.3%    | 68.6%        | 71.4%| 68.3%  |
| 40 to 49               | 87.0%    | 79.3%  | 76.6%   | 51.6%| 61.3%   | 60.7%    | 69.5%        | 74.0%| 69.6%  |
| 50 to 59               | 87.4%    | 80.4%  | 77.9%   | 52.0%| 61.8%   | 61.1%    | 70.3%        | 74.6%| 69.8%  |
| More than 60           | 88.5%    | 81.2%  | 78.7%   | 53.4%| 62.5%   | 62.8%    | 70.8%        | 77.5%| 70.2%  |
| P value                | .13      | .76    | .54     | .15  | .46     | .44      | .56          | .41  | .25    |
| Ethnicity              |          |        |         |      |         |          |              |       |        |
| Non-Hispanic           | 87.2%    | 79.9%  | 77.3%   | 51.9%| 61.6%   | 61.1%    | 69.9%        | 74.7%| 69.5%  |
| Hispanic               | 88.1%    | 80.8%  | 77.9%   | 53.2%| 62.4%   | 61.9%    | 70.5%        | 73.9%| 70.5%  |
| Difference (95% CI)    | -.9%     | -.9%   | -.6%    | -.4% | -.8%    | -.0%     | -.5%         | .8%  | -1.0%  |
| P value                | .13      | .26    | .54     | .15  | .46     | .44      | .56          | .41  | .25    |
| Race                   |          |        |         |      |         |          |              |       |        |
| White                  | 88.2%    | 81.2%  | 78.9%   | 53.6%| 63.3%   | 62.9%    | 71.6%        | 76.4%| 70.6%  |
| Nonwhite               | 85.6%    | 77.8%  | 74.5%   | 49.2%| 58.6%   | 57.9%    | 67.0%        | 71.0%| 67.9%  |
| Difference (95% CI)    | 2.6%     | 3.4%   | 4.4%    | 4.4% | 4.7%    | 5.0%     | 4.5%         | 5.5% | 2.7%   |
| P value                | <.001    | <.001  | <.001   | <.001| <.001   | <.001    | <.001        | <.001| <.001  |
| Specialty              |          |        |         |      |         |          |              |       |        |
| Medicine               | 83.9%    | 74.8%  | 70.9%   | 47.2%| 55.6%   | 55.0%    | 64.2%        | 67.5%| 65.4%  |
| Obstetrics and Gynecology | 91.1% | 87.2%  | 86.6%   | 57.9%| 68.8%   | 68.1%    | 76.8%        | 79.7%| 75.6%  |
| Surgery                | 90.1%    | 83.1%  | 80.6%   | 55.6%| 66.4%   | 66.1%    | 74.3%        | 82.3%| 72.1%  |
| Other                  | 85.8%    | 83.2%  | 85.0%   | 47.8%| 60.2%   | 61.1%    | 68.1%        | 73.5%| 70.8%  |
| Difference, obstetrics, | 6.6%    | 12.4%  | 10.1%   | 9.4% | 11.9%   | 11.9%    | 11.2%        | 13.6%| 8.2%   |
| surgery and other versus medicine (95% CI) | (5.8%-7.3%) | (11.4%-13.4%) | (9.2%-11.1%) | (8.2%-10.7%) | (10.6%-13.1%) | (10.7%-13.2%) | (10.1%-12.3%) | (12.5%-14.7%) | (7.2%-9.3%) |
| P value                | <.001    | <.001  | <.001   | <.001| <.001   | <.001    | <.001        | <.001| <.001  |

Abbreviation: CI, confidence interval.

aP < .05 for 60 or older, compared to younger.
bP < .05 for 50 or older, compared to younger.
cP < .05 for 40 or older, compared to younger.
Table 4. Multivariate Analysis of Patient Satisfaction Top-Box Scores Versus Physician Characteristics.a

| Characteristic            | Courtesy | Listen | Explain | Time | Concern | Informed | Friendliness | Skill | Rating |
|---------------------------|----------|--------|---------|------|---------|----------|--------------|-------|--------|
| Gender, female (reference)| ref      | ref    | ref     | ref  | ref     | ref      | ref          | ref   | ref    |
| Gender, male (95% CI)     | 1.07     | 1.05   | 1.06    | 1.03 | 1.03    | 1.08     | 1.02         | 1.04  | 0.99   |
|                          | (0.96-1.18) | (0.95-1.15) | (0.97-1.16) | (0.94-1.12) | (0.95-1.13) | (0.98-1.18) | (0.93-1.11) | (0.94-1.15) | (0.92-1.08) |
| P value                   | .23      | .34    | .18     | .56  | .47     | .11      | .73          | .42   | .88    |
| Age (aOR for 1 year increase) (95% CI) | 1.03 | 1.02 | 1.01 | 1.02 | 1.00 | 1.01 | 1.00 | 1.05 | 1.01 |
|                          | (0.99-1.07) | (0.99-1.06) | (0.97-1.04) | (0.99-1.05) | (0.96-1.04) | (0.98-1.05) | (0.97-1.04) | (1.01-1.09) | (0.98-1.04) |
| P value                   | .18      | .23    | .76     | .28  | .95     | .55      | .96          | .03   | .69    |
| Ethnicity, Hispanic (reference) | ref | ref | ref | ref | ref | ref | ref | ref | ref |
| Ethnicity, non-Hispanic (95% CI) | 0.91 | 0.93 | 0.96 | 0.97 | 0.97 | 0.98 | 0.98 | 0.99 | 0.95 |
|                          | (0.81-1.03) | (0.84-1.03) | (0.87-1.06) | (0.88-1.06) | (0.88-1.07) | (0.87-1.07) | (0.89-1.09) | (0.88-1.10) | (0.87-1.03) |
| P value                   | .13      | .15    | .40     | .50  | .50     | .48      | .73          | .82   | .21    |
| Race, Nonwhite (reference) | ref | ref | ref | ref | ref | ref | ref | ref | ref |
| Race, white (95% CI)      | 1.04     | 1.02   | 1.02    | 1.05 | 1.05    | 1.05     | 1.04         | 1.05  | 1.00   |
|                          | (0.95-1.15) | (0.93-1.11) | (0.94-1.11) | (0.98-1.14) | (0.97-1.14) | (0.97-1.14) | (0.96-1.13) | (0.96-1.15) | (0.93-1.08) |
| P value                   | .36      | .69    | .60     | .18  | .24     | .23      | .29          | .27   | .97    |
| Specialty, medicine (reference) | ref | ref | ref | ref | ref | ref | ref | ref | ref |
| Specialty, obstetrics (95% CI) | 1.99 | 2.36 | 2.71 | 1.54 | 1.75 | 1.75 | 1.84 | 1.84 | 1.63 |
|                          | (1.78 to 2.22) | (2.14 to 2.60) | (2.47 to 2.97) | (1.42 to 1.67) | (1.59 to 1.91) | (1.60 to 1.92) | (1.68 to 2.01) | (1.66 to 2.03) | (1.51 to 1.77) |
| P value                   | <.001    | <.001  | <.001   | <.001 | <.01    | <.01     | <.001        | <.01  | <.01   |
| Specialty, surgery (95% CI) | 1.61 | 1.58 | 1.63 | 1.35 | 1.51 | 1.51 | 1.55 | 1.94 | 1.35 |
|                          | (1.45-1.79) | (1.44-1.73) | (1.49-1.78) | (1.24-1.47) | (1.38-1.65) | (1.38-1.65) | (1.42-1.69) | (1.76-2.15) | (1.25-1.46) |
| P value                   | <.001    | <.001  | <.001   | <.001 | <.001   | <.001     | <.001        | <.001 | <.001  |

Abbreviations: CI, confidence interval; aOR, adjusted odds ratio.
aData are presented as adjusted odds ratios.
than emergently (19), and incurring higher health-care expenditures (12,20); hospital traits themselves like being a nonteaching facility and having a smaller local population size (21); and hospitality issues like room amenities and cleanliness (22,23).

Patient satisfaction specifically regarding physicians also incorporates factors other than quality of care received. In an inpatient study of patient–physician satisfaction in trauma patients, higher physician ratings were correlated with patients being older, having a higher degree of acute illness, and having surgery (24). In an outpatient spine clinic, low physician scores were associated with patients having younger age, less formal education, smoking, and the presence of a worker’s compensation claim (25). Physicians can actively improve their satisfaction with certain interventions, such as communicating preoperatively in an effective manner on the day of a surgery (26); calling fewer inpatient consultations during a prolonged hospital stay (27); exhibiting provider empathy in a clinic setting (28,29); explaining a medical condition and treatment; and ensuring reliable follow-up communication (29). Physicians may also improve patient satisfaction through targeted interventions such as education and real-time feedback (30). This study demonstrates that satisfaction regarding physician care also depends on inherent physician attributes.

The most significant finding in this study is that patient satisfaction ratings of their physicians differ by specialty. Obstetricians and surgeons were consistently rated higher than medicine providers. This finding is compatible with CMS data. For example, on the July 2017 HCAHPS Mode and Patient Mix Adjustment report, compared to patients on medical services, top-box ratings regarding “communication with doctors” from patients on maternity services were 13.4% higher, and top-box ratings from patients on surgical services were 8.7% higher (31).

This finding is surprising. Traits that are associated with practitioners in medicine, such as courtesy, listening carefully, explaining difficult concepts, and spending time with patients, were less likely to be rated in the top box by patients under the care of a medicine physician. In obstetrics, this result may be due to the fact that having a baby is a joyous occasion and may boost patients’ opinions of their physicians. In surgery, a patient who requires an operation may perceive himself as more ill and thus reward a surgeon with higher scores at discharge. In both obstetrics and surgery, a patient may be admitted with a diagnosis and have that problem fully resolved before discharge, while in medicine, a patient’s condition may simply be controlled to the point where they can leave the hospital safely.

On the question of Skill, 2 interesting findings emerged. Older physicians were more likely to be rated in the top box, perhaps due to patients equating experience with skill. Surgeons were rated in the top box more often than obstetricians, perhaps due to patients relating skill in the operating room to overall skill as a physician.

Univariate analysis of the data revealed that white physicians were rated higher than nonwhite physicians. However, in the multivariate analysis, race no longer demonstrated a relationship with scores. This finding likely occurred due to the confounding effect of specialty. More physicians in medical specialties were nonwhite. Thus, the lower ratings in nonwhite physicians result from practicing in the medicine specialty, not from being nonwhite.

The results of this study suggest that patient satisfaction demonstrates unconscious bias. By definition, unconscious bias is ingrained but unintentional. We chose to evaluate gender, age, and race since these variables are frequently implicated in unconscious bias (32). However, specialty turned out to have the largest effect. It is important to be aware of unconscious bias in order to reduce its influence. Hospital systems should consider setting different patient satisfaction goals for certain physician specialties based on the results of this study.

**Strengths and Limitations**

Strengths of this study include its large sample size of surveys and physicians. Many of the differences seen in scores across physician attributes were highly statistically significant, but the absolute magnitude of the differences was generally low. In addition, our survey included questions from HCAHPS, the national hospital public reporting standard for patient satisfaction, and Press Ganey, a well-known patient satisfaction research organization. Many hospital systems use surveys with similar questions, which lends reproducibility.

There are some limitations to the study. Response rates to surveys were low but were comparable to national rates for HCAHPS (33). Surveys were attributed to the physician at the time of discharge, which may not have been the physician most involved in the care of the patient. Generalizability may also be limited, since these surveys were from patients in a specific region of the United States. We chose to assign ethnicity and race using a name and photograph in order to reflect a real-world setting, where patients may make similar assumptions upon meeting a physician for the first time. Our assigners disagreed often on exact race, although the agreement was stronger for the dichotomy of white versus nonwhite. Finally, all of the covariates used in the analysis were at the physician level. We did not have data at the patient level other than the surveys.

**Conclusion**

On inpatient adult surveys, patient satisfaction scores regarding physician care and communication are associated with physician specialty and age. These findings should be considered when setting patient satisfaction goals for inpatient physicians.

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