

# Different Combining Process Between Male and Female Patients to Reach Their Overall Satisfaction

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## Abstract

Patient satisfaction and how it is measured is an important field of study in healthcare. Consequently, there have been many patient satisfaction studies. However, there is a lack of studies that focused on how male and female patients perceive, or weigh, their overall satisfaction. Determining the weights of these attributes by gender is an important outcome to determine overall patient satisfaction and quality of care. Data were collected by applying the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey instrument to record regular patient experience at 70 United States hospitals. The data were collected between July 1, 2011 and June 30, 2012, and there are 43,938 cases in the data set. This study found that all five of the attributes (Nursing Care, Physician Care, Staff Care, Room, and Help) had an association with patient satisfaction. Among them, nursing Care had the largest influence on patient satisfaction of all of the five attributes. This study also showed a statistically significant interaction effect by gender for the interaction between Nursing care x Gender, Physician care x Gender, and Help x Gender. Female patients rated their relationship with their nurses as being more important to their overall satisfaction, while male patients rated their relationship with their doctor as being more important to overall satisfaction. Male patients also rated their relationship with help as being more important to overall satisfaction when compared with the results from female patients. Suggestions to healthcare managers are also discussed.

## Keywords

patient satisfaction, hospital, gender survey

## Introduction

Patient satisfaction and how it is measured is an important field of study in health care. The study and research of patient satisfaction has an even greater importance now with the passage of the Patient Protection and Affordable Care Act (ACA) in 2010, which has mandated the use of measures of the quality of care such as patient satisfaction to evaluate the effectiveness of health-care services (1). The ACA places new emphasis on measuring patients' experiences of care and using that information to improve care. This act also repeatedly refers to patient centeredness, patient satisfaction, patient experience of care, and patient engagement in its provisions. For example, the ACA requires patient-centered assessments as a method to evaluate the term "quality measures" in the law's language (2).

Patient satisfaction is also listed as a determinant of quality of care by the Institute of Medicine, which designated "patient centeredness" as 1 of 6 goals for a 21st-century health-care system (1). Thus, patient satisfaction, as a determinant of quality of care, is a research area that has been and will be studied and measured even more in the future.

Although most patient satisfaction studies have analyzed male and female patients together, a review of the literature found a significant number of articles that focused on the association between patient gender, health-care utilization, and health-care spending. These studies found an association between patient gender and health-care utilization and expenses, but some of the studies had conflicting results. One of the results of these studies was, according to Mustard, that expenditures for health care were similar for males and

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females (3). However, Mustard's study results were not the same as the findings of the majority of these articles. For example, Bertakis et al found that female patients have higher charges for primary care, diagnostic services, and total services (4,5). In addition, Sarker et al's article found similar results in a study from Bangladesh, which found that the cost for hospitalization was significantly higher for females than for males (6).

The existing body of literature also documented that patient satisfaction differed by the gender of the patient. Elliott et al compared the experiences of male and female inpatients and found generally less positive experiences for women than men, especially for communication about medicines, discharge information, and facility cleanliness. Furthermore, this study found that the gender disparities were generally larger for older patients, patients with worse self-reported health status, and in for-profit hospitals (7).

According to Lavernia et al, there was a gender difference in patient-perceived functional measures for hip surgery. Women were more likely than men to perceive and report greater improvement after the surgery, although women scored lower on a physician hip function test after the surgery. Both genders also had the same hospital length of stay after the surgery was completed. The study's results suggested that women's perceptions of their health were associated with a wide range of nonhealth-related factors (8).

These results were also supported by the Pini et al study that researched patient satisfaction of outpatient services. This study found a supportive outcome by gender, finding that how patients graded outpatient services was associated with the gender of the patient. Females reported significantly lower scores than males; females experienced less satisfaction with medical examination afternoon surgeries than males (9). Vasudevan et al's study found similar results in measuring quality of care in patients with inflammatory bowel disease, finding that female patients reported lower satisfaction with their overall quality of care (10).

Unfortunately, there was a lack of studies that focused on how male and female patients perceive, or weigh, their overall satisfaction. For example, did male patient satisfaction focus more on his interaction with the doctor or with his interaction with nurses? Did female patient satisfaction focus more on her hospital room or on her doctor? Determining the weights of these attributes by gender is an important outcome to determine overall patient satisfaction and quality of care. This study provided a modeling approach to determine the weights of a set of attributes, by gender, to determine patient satisfaction.

## Methods

### *Design, Data Source, and Setting*

Data were collected by applying the Hospital Consumer Assessment of Healthcare Providers and Systems

(HCAHPS) survey instrument to record regular patient experience at 70 US hospitals representing a large, national, private, not-for-profit hospital system. The 70 hospitals were largely located in the Midwest, Southeast, South, Northwest, and Northeast and represented a wide range of hospitals in size, services, and geography. Critical access, community, and tertiary hospitals were represented in the data set. The HCAHPS was developed by the Centers for Medicare and Medicaid Services in collaboration with the Agency for Healthcare Research and Quality in order to provide a standardized survey instrument for measuring patients' perspective on hospital experiences (11). A rigorous process was undertaken by the RAND Corporation, Harvard Medical School, and American Institutes for Research together with Westat to develop and validate the HCAHPS instrument, and the results (psychometric properties including validity and reliability, credibility, usefulness, etc) were confirmed and published elsewhere (12,13). For further details on HCAHPS survey administration, see HCAHPS Quality Assurance Guidelines version 5.0 (14). Data were collected through telephone interviews conducted on a constant and regular basis for each hospital. Patients discharged from one of the hospitals were randomly selected and contacted (generally within a week) and responded directly to the survey vendor. The data were collected between July 1, 2011, and June 30, 2012, and there are 43 938 cases in the data set. Response rates vary by individual hospital, but across all hospitals, the average response rate was 40%. This study obtained the institutional review board approval.

### *The HCAHPS Survey Measures*

The HCAHPS survey yields a series of measures of patients' hospital experience. Moreover, the survey includes standalone items and global measures. For the purpose of this study, we selected 5 composite measures of hospital experience—communication with nurses, communication with doctors, quality of the hospital room, responsiveness of hospital staff, and help (Please see <http://www.hcahponline.org> for the entire survey instrument as well as administration protocols). The arithmetic mean of these items for each of the 5 attributes was used as a composite index for the independent variable. The composite index was calculated as long as at least 1 item was responded. For each item, the response options are as follows—1, never; 2, sometimes; 3, usually; and 4, always.

Control variables included demographic characteristics such as the patients' race, age, and educational attainment. The race variable was classified as African American, Asian American, American Indian/Alaska Native, and white. The dependent variable, which was derived from the HCAHPS, included a single item asking respondents to rate their experience with an overall rating of the hospital with scores ranging from 0 ("worst possible" hospital) to 10 ("best possible" hospital).

**Table 1.** Descriptive Statistics of Survey Items and Composite Indexes.

	n	Mean	SD	Description
<b>Nursing care</b>				
1	36 284	3.84	0.468	How often did nurses treat you with courtesy and respect?
2	36 336	3.74	0.570	How often did nurses listen carefully to you?
3	36 276	3.70	0.613	During this hospital stay, how often did nurses explain things in a way you could understand?
CI	36 523	3.76	0.456	Composite index (mean of the 3 items)
<b>Physician care</b>				
4	36 170	3.85	0.476	How often did doctors treat you with courtesy and respect?
5	36 137	3.74	0.602	How often did doctors listen carefully to you?
6	36 185	3.70	0.630	How often did doctors explain things in a way you could understand?
CI	36 408	3.76	0.500	Composite index (mean of the 3 items)
<b>Room</b>				
7	35833	3.59	0.743	How often were your room and bathroom kept clean?
8	36217	3.52	0.757	How often was the area around your room quiet at night?
CI	36469	3.55	0.594	Composite index (mean of the 2 items)
<b>Staff</b>				
9	26 170	3.77	0.548	How often did the hospital staff do everything they could to help you with your pain?
10	18 042	3.68	0.716	Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?
11	17 714	3.03	1.171	Before giving you any new medicine, how often did hospital staff describe side effects in a way you could understand?
CI	30 687	3.59	0.666	Composite index (mean of the 3 items)
<b>Help</b>				
12	20 219	3.65	0.665	How often did you get help in getting to the bathroom or in using a bedpan as soon as you wanted?
13	31 101	3.51	0.709	After you pressed the call button, how often did you get help as soon as you wanted it?
CI	32 911	3.57	0.642	Composite index (mean of the 2 items)
<b>Dependent variable</b>				
	36 294	9.00	1.553	Overall rating of the hospital (0-10)

Abbreviation: SD, standard deviation.

**Statistical Analysis**

Descriptive statistics for the single items and composite indices are presented in Table 1. Multivariate linear regression analysis with list-wise deletion was used to assess the independent associations between the patients' gender, the 5 HCAHPS dimensions (hospital experience measures), and overall patient satisfaction. All 5 hospital experience HCAHPS dimensions and gender were entered simultaneously with the control variables (age, race, self-perceived

**Table 2.** Sociodemographic Characteristics of the Respondents.

Variable	n	%
<b>Gender</b>		
Male	13 020	36.7
Female	22 431	63.3
<b>Race</b>		
White	31 001	84.9
Black	4856	13.3
Asian	432	1.2
Pacific Islander	22	0.1
Native American	217	0.6
<b>Age</b>		
18-24	1675	4.6
25-29	2129	5.8
30-34	2080	5.7
35-39	1385	3.8
40-44	1383	3.8
45-49	1873	5.1
50-54	2558	7.0
55-59	3337	9.1
60-64	3787	10.4
65-69	4,139	11.3
70-74	3821	10.5
75-79	3260	8.9
80-84	2880	7.9
85-89	1626	4.5
90 or older	595	1.6
<b>Education</b>		
Completed eighth grade or less	1416	3.9
Some high school but did not graduate	3453	9.6
GED	11 441	31.8
Some college or 2-year college degree	11 104	30.9
4-year college	4435	12.3
More than 4-year college	4117	11.4

Abbreviation: GED, general equivalency diploma.

health, and education). A series of multivariate linear regression models consisted of interaction terms. The interaction effects were analyzed by creating a product term for each independent variable (eg, communication with nurses) and being female (with being male serving as the reference group) while controlling for the same background variables as follows—communication with nurses × gender, communication with doctors × gender, responsiveness of hospital staff × gender, hospital room × gender, and help × gender. The different combining processes of patients with gender and the hospital experience scale were assessed with the significance levels of the coefficients of the product terms. In all analyses, *P* < .05 was considered statistically significant. All statistical analyses were performed using SPSS version 22.

**Results**

The descriptive statistics for the patient characteristics are presented in Table 2. In brief, the majority (63.3%) of the participants were female. Most of the patients were white (84.9%). Patient age was grouped using an ordinal scale of

**Table 3.** Parameter Estimates of Attributes and Control Variables.

Independent Variables	$\beta$	SE	t Value	P Value
Intercept	-1.228	.122	-10.09	<.0001
Nursing care	1.01 <sup>a</sup>	.034	29.43	<.0001
Physician care	.597 <sup>a</sup>	.027	22.43	<.0001
Staff care	.333 <sup>a</sup>	.022	15.31	<.0001
Room	.432 <sup>a</sup>	.023	18.93	<.0001
Help	.369 <sup>a</sup>	.022	16.89	<.0001
Gender (female)	-.343 <sup>a</sup>	.138	-2.45	.013
Age	.031 <sup>a</sup>	.002	16.00	<.0001
Education	-.047 <sup>a</sup>	.006	-8.52	<.0001
Nursing care $\times$ gender	.238 <sup>a</sup>	.042	5.72	<.0001
Physician care $\times$ gender	-.069 <sup>a</sup>	.033	-2.09	.036
Staff care $\times$ gender	.043	.026	1.61	.106
Room $\times$ gender	-.047	.027	-1.7	.089
Help $\times$ gender	-.058 <sup>a</sup>	.027	-2.19	.028
Perceived health	-.004	.006	-.643	.52
Race				
African American	.027	.02	1.37	.171
Asian	-.198 <sup>a</sup>	.059	-3.34	.001
Pacific Islander	.127	.242	.524	.600
American Indian/Alaskan	.216 <sup>a</sup>	.085	2.55	.011
Native				

$R^2 = .522$

<sup>a</sup>Statistically significant ( $P < .05$ ). Gender: "Male" is the reference group. Race: "White" is the reference group.

18-24, 25-29, 30-34, 35-39, . . . 80-84, 85-89, and 90 or older and was fairly evenly distributed among the various age groups, the highest percentage (11.3%) being in the 65- to 69-year-old category. With reference to educational attainment, the education level was grouped using an ordinal scale of "completed eighth grade or less," "some high school but did not graduate," "general equivalency diploma (GED)," "some college or 2-year college degree," "4-year college," and "more than 4-year college." The most common categories included those who earned a "GED" (31.8%) and "some college or 2-year college degree" (30.9%).

### Multiple Regression Results

Table 3 summarizes results from the multiple regression model. All 5 hospital experience indicators were significantly associated with overall satisfaction. For example, patients who would report a 1-point increase in positive experiences with communicating with the doctors and with the nurses were associated with a 0.597-point and a 1.01-point increase, respectively, in overall satisfaction. Patients who would report a 1-point increase in positive experience with the responsiveness of the hospital staff was associated with a 0.333-point increase in overall satisfaction. Compared to male patients, female patients were less likely to give a positive hospital rating. With an increase in age category, overall satisfaction of patients would increase by 0.031 points. On the other hand, an increase in educational attainment was negatively associated with overall patient satisfaction, with a decrease of -0.047 points.

Table 3 also presents the statistically significant interaction terms from the regression model. A positive and statistically significant interaction effect was found between nursing care and being a female patient. In other words, for female patients, relationship with nurses was more important in their ratings of overall satisfaction compared to male patients. Conversely, a negative and statistically significant interaction effect was found between physician care and being a female patient. That is, for male patients, relationship with physicians was more important in their ratings of overall satisfaction than female patients. Similarly, a negative and statistically significant interaction effect was found between help and being a female patient. That is, for male patients, help was more important in their ratings of overall satisfaction than female patients. The 2 interaction terms (responsiveness of hospital staff care  $\times$  gender and quality of room  $\times$  gender) were not statistically significant.

In terms of race, Asians were less likely to give a positive hospital rating, and American Indians/Alaska Natives were more likely to provide a positive hospital rating, when compared to white patients. The results for African Americans and Pacific Islanders were not statistically significant. According to the model, the  $R^2$  was .522 which explains 52.2% of the variance.

### Discussion

The purpose of this study was to produce modeling approach to determine the weights of a set of attributes, by gender, to determine patient satisfaction. Control variables included demographic characteristics (age, race, and education). Self-perceived health was also included as a control variable.

This study found that all 5 of the attributes (nursing care, physician care, staff care, room, and help) had an association with patient satisfaction. Nursing care had the largest influence on patient satisfaction of all of the 5 attributes that were included in the analysis of this study. This finding was consistent with the review of patient satisfaction literature (15,16).

The study's results also found a positive relationship between all 5 attributes and patient satisfaction, indicating that an increase in any of the attributes was associated with an increase in patient satisfaction. This finding suggests that health-care administrators should be concerned with all 5 of these attributes in order to increase patient satisfaction ratings for their respective hospitals and health-care facilities. Specifically, these administrators should utilize resources to improve nursing care, the highest rated of all 5 of the attributes.

Another important finding from this study showed a statistically significant interaction effect by gender for the interaction between nursing care  $\times$  gender, physician care  $\times$  gender, and help  $\times$  gender. Female patients rated their relationship with their nurses as being more important to their overall satisfaction, whereas male patients rated their relationship with their doctor as being more

important to overall satisfaction. Male patients also rated their relationship with help as being more important to overall satisfaction when compared to the results from female patients.

The overall results suggest that patient satisfaction does depend on the patient's gender. Specifically, the results found statistically significant interaction effects between nursing care, physician care, help, and being a female patient.

### **Study Strengths and Limitations**

Although this study provided more insight into the study of patient satisfaction, it did have some limitations. First, one limitation is that since this was a cross-sectional study, the study's findings only established an association without a causal relationship. A longitudinal study design would have been better suited to assess causality. However, this study used articles from a thorough literature review to explain the relations between attributes and variables of interest in this study.

Second, HCAHPS data were voluntarily submitted by certain hospitals, which might not be representative of all hospitals in terms of location and bed size. This limitation decreased the ability to generalize the study's results for some types of hospitals. Although study participants were randomly selected from specific regions across the United States, not all of the country's regions were represented in this study. Thus, although the HCAHPS survey instrument consists of validated and reliable measures, the study's findings would not be generalizable to all regions within the United States. Another limitation of the study is that its participants could have either underreported or overreported their satisfaction levels for 5 hospital care services, which could introduce reporting bias in the data.

Third, we were unable to control for the consumers' attitudes toward physicians and nurses before their hospital stay. Studies have shown that prior experience with health-care facilities has a significant impact on both expectations and satisfaction with contemporary hospital encounters (17). One study found that previous hospital experiences have a statistically significant effect on subsequent patient perceptions of overall quality of care (18), whereas another study found that past in-patient experience led to lower satisfaction with regard to care, comfort, and cleanliness in the future (19). Individual health status and its influence on hospital satisfaction has also been scrutinized in some detail. However, the results have been inconsistent with some studies indicating a positive link (20,21) and some demonstrating health status as a weak predictor of patient satisfaction (22). A more recent study found that compared to patients with excellent self-reported health status, those with a lower self-reported health status were inclined to view physician care as more important than either nursing or staff care (23). Future research could investigate the nexus between prior hospital

experience, self-perceived health status, and overall hospital satisfaction.

### **Conclusion**

This study showed that each of the 5 composite measures of hospital experience included in this study—communication with nurses, communication with doctors, quality of the hospital room, responsiveness of hospital staff, and help—had a statistically significant association with patient satisfaction. The analysis included in this study revealed some implications for health-care managers as to how they can improve patient satisfaction. Specifically, some of the attributes included in this study were more influential than the others. Nursing care was the most influential attribute, which implies that health-care managers should focus its resources on nursing care to improve overall patient satisfaction.

Another important finding of this study was that the results showed that the modeling approach tested in this study provided an effective mechanism to determine the weights of a set of attributes, by gender, to determine patient satisfaction. According to the model's results, 3 of the 5 weights included in the model (nursing care, physician care, and help) had statistically significant relationship with patient gender. Compared to male patients, female patients considered nursing care to be more influential than either physician care or help.

Again, the findings from this modeling approach have important implications for health-care managers because this study found that patient satisfaction varies by gender and specific attributes that are related to patient satisfaction. If, for example, a hospital or health-care facility has more female than male patients, managers should spend more of its resources on nursing care. However, if another facility has more male patients, its resources should be spent on physician care and help to improve patient satisfaction. Since the modeling approach tested in this study demonstrated significant differences as to how male and female patients perceive patient satisfaction, this modeling approach will be researched further to determine how to improve patient satisfaction for health-care facilities.

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