



The Relationship Between Patient Satisfaction With Hospitalization and Outcomes Up to 6 Months Post-Discharge in Cardiac Patients

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Abstract

Little is known about the relationship between patient satisfaction with inpatient care and post-discharge outcomes. This study examined inpatient hospital satisfaction after a cardiac event and outcomes through 6 months post-discharge. We examined 327 cardiac patients from the Bridging the Discharge Gap Effectively database who completed a patient satisfaction survey about their hospital admission and had post-discharge outcomes data. Higher patient satisfaction with the discharge process correlated with fewer readmissions at 90 days post-discharge. Higher patient satisfaction with hospital staff management of personal issues correlated with fewer emergency department visits at 6 months post-discharge. Higher patient satisfaction with overall assessment of care and hospitalization correlated with lower mortality rate at 6 months post-discharge. Being nonwhite correlated with lower nursing care satisfaction. Associations between cardiac patient satisfaction and outcomes exist. In this population, higher patient satisfaction correlated with better outcomes. Patient satisfaction data may be able to inform areas for health system improvement.

Keywords

patient satisfaction, cardiovascular disease, quality improvement, patient outcomes, inpatient patient satisfaction, post-discharge outcomes, cardiovascular medicine

Introduction

In recent years, the field of medicine has moved toward a quality-based structure for defining success and for reimbursement. As a result, cardiovascular conditions, such as myocardial infarction (MI) and congestive heart failure (CHF), have come under scrutiny because of their high rates of readmission and cost to the health care system. With the implementation of the Hospital Readmission Reduction Program (HRRP), the Centers for Medicare and Medicaid Services now penalize hospitals with higher than average risk-adjusted readmission rates for these cardiac conditions (1). Amid this change, the inclusion of patient satisfaction as a quality measure has become more common (2–7).

Patient satisfaction measures are commonly used as quality indicators to assess a patient's contentment with their clinician, the institutional environment, and the processes (5,7,8). In light of the recent adoption of programs such as pay-for-performance, bundled care units, and the HRRP,

clinician pay and hospital reimbursement are inextricably linked to patient satisfaction and outcomes (1,2,5–9).

Whether or not there are associations between patient satisfaction and clinical outcomes is a subject of debate (10–17). Some studies have found that higher patient satisfaction is associated with lower mortality rates and better post-surgical outcomes (12). However, other studies have shown a correlation between higher patient satisfaction and

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higher mortality, inpatient admissions, and overall health care expenditure (10).

These discordant results question the use of patient satisfaction as a quality measure. Yet, some argue that the inconsistency of these results is not because patient satisfaction is a poor indicator, but because these studies are measuring patient satisfaction differently (13). Manary et al observed that studies that measured patient satisfaction for a specific event or visit tended to show positive correlations with improved patient outcomes. Conversely, studies that assessed patient satisfaction over a long period of time showed no correlation or a negative correlation with improved patient outcomes (13). Asking patients to evaluate their satisfaction with health care experiences over time may lead to recollection bias and confusion about which interactions should be factored into their evaluation (13).

Patient Satisfaction and Patient Outcomes in Cardiovascular Medicine

Positive correlations with patient satisfaction and outcomes have been demonstrated in MI and CHF patients. Among MI patients, higher patient satisfaction was associated with fewer inpatient deaths and higher hospital adherence to American Heart Association MI guidelines (14). Similarly, higher patient satisfaction was associated with lower 30-day readmissions among both CHF and MI patients (15,16). Notably, these studies measured patient satisfaction for a specific hospital admission. When all health care interactions of MI patients were evaluated over 1 month, the correlation between satisfaction and outcomes disappeared (17).

In this study, we sought to add to the growing body of knowledge on the relationship between patient satisfaction with inpatient cardiovascular care and adverse outcomes in several ways:

First, we analyzed outcomes through 6 months post-discharge, whereas previous studies have only analyzed up to 30 days post-discharge. While outcomes 30 days post-discharge are important for Medicare reimbursement, risk of morbidity and mortality exists much longer post-discharge and should be measured and addressed. One study found that in the geriatric population, the rate of readmission jumped from 5.6% at 30 days to 23.3% at 180 days. Over 20% of these readmissions at both 30 and 180 days were due to the same condition as the index admission (18).

Second, unlike several previous studies, we have also included emergency department (ED) visits as an outcome measure in addition to readmissions and mortality. This is important not only because of the cost of ED visits to patients and health care systems but also because ED visits post-discharge can be predictive of future readmissions (19). Further, a post hoc analysis among patients with a primary discharge diagnosis of CHF was also conducted.

Methods

Study Population

Patients referred to the Bridging the Discharge Gap Effectively (BRIDGE) cardiac transitional care program from 2008 to 2015 within a single hospital system and who responded to a routinely sent patient satisfaction survey evaluating their index hospital admission were eligible for this study. All patients with a primary or secondary cardiac discharge diagnosis and who lack a follow-up appointment with a cardiologist within 14 days post-discharge are referred to the BRIDGE clinic for follow-up. The BRIDGE database collects information on patients referred to the program, including data on the index admission, demographics, medical history, and outcomes (readmissions, ED visits, deaths) up to 6 months post-discharge. Data inputted into the BRIDGE database is manually extracted by trained abstractors from medical records. This study was approved by the local institutional review board and adhered to the guidelines set forth by the Declaration of Helsinki.

Data Definitions

The demographic variables analyzed in this study consist of the following: gender, age, race, socioeconomic status (SES), marital status, Charlson comorbidity index score, and primary cardiac diagnosis upon discharge. Race was categorized as “White” or “non-White.” Socioeconomic status was based on the median household income for the patients’ zip code. High and low SES were defined as above or below the median household income for the state of Michigan (\$46,859), respectively. Survey completion rates were also compared by primary discharge diagnosis: acute coronary syndrome (ACS), CHF, atrial fibrillation (AF), and other.

The Charlson comorbidity index is a weighted index used to predict risk of death within 1 year for patients based on their comorbid conditions and age (20). Each condition is assigned a score based on the mortality risk for that condition; the scores are totaled based on number of conditions a patient has, as well as the patients’ age (21).

Patient outcomes evaluated were ED visits, readmissions, or death within 6 months of index discharge. Only the date of the first ED visit or readmission post-discharge was recorded. Patients are assumed to be alive at 6 months post-discharge unless death is confirmed in the electronic medical record.

Patient Satisfaction Data

Patient satisfaction data were obtained from the health system’s Office of Quality Analytics. Like other similar studies, inpatient patient satisfaction surveys were administered and their data collected via Press Ganey Associates (PGA) (14). Patients were eligible to receive a survey if they were over 18 years of age, stayed at least one night in the inpatient setting, were alive at discharge, and had not also been sent

the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey. Press Ganey Associate surveys were sent by mail within 8 to 11 days of hospital discharge to eligible patients according to PGA's proprietary algorithm.

The Press Ganey Inpatient Patient Satisfaction Survey is a commonly used self-report measure of patient satisfaction. It is a validated survey with high internal consistency reliability (22). The survey also has high predictive validity, as past work has demonstrated that the scale accounts for approximately 75% of variance in patients' likelihood of recommending a hospital (22).

Patient satisfaction data consist of 10 categories related to the hospital experience: admission, meals, room, tests and treatments, visitors and family, personal issues, nurses, physicians, discharge, and overall assessment. Each category includes items measured on a 5-point Likert-type scale ranging from "very poor" to "very good." An average score from 1 to 5 for each of the 10 categories was calculated for each patient as well as a composite satisfaction score for the entire survey. Composite scores were calculated as the mean score based on the total number of questions each patient answered.

Statistical Analysis

Data were analyzed using SPSS 24.0 (IBM Corp). All variables were assessed for compliance with statistical assumptions. Nonparametric tests were used for assessing all data that were not normally distributed; specifically, the patient satisfaction data that were negatively skewed toward high satisfaction. Patients with missing outcomes data were excluded.

Spearman's rank correlations were used to assess for relationships between the 10 patient satisfaction categories and demographics, ED visits, and readmissions (30, 60, 90 days, and 6 months post-discharge). Death was analyzed at 6 months. Mann-Whitney *U* tests were performed to assess the difference in average patient satisfaction scores for each category and each outcome variable for patients with a primary diagnosis of CHF. Significance was defined a priori as $P < .05$.

Results

Study Population

Of 3901 patients in the BRIDGE database from 2008 to 2015, 338 also completed a patient satisfaction survey. Of these, 11 (3.3%) patients were excluded for missing outcomes data. The mean age for the final sample was 67.85 ± 13.07 years, 89.6% were white ($n = 292$), 27.8% were from low SES communities ($n = 77$), and 66.5% were married ($n = 153$). The average Charlson comorbidity index score was 4.84 ± 2.47 . The most common primary discharge diagnosis was ACS ($n = 104$, 31.8%), followed by AF ($n = 63$, 19.4%) and CHF ($n = 60$, 18.5%).

Table 1. Average Patient Satisfaction Scores and Outcomes (N = 327).

Patient satisfaction scores, mean \pm SD	
Admission	4.54 \pm 0.63
Discharge	4.35 \pm 0.66
Personal issues	4.48 \pm 0.59
Visitors and family	4.58 \pm 0.53
Meals	4.11 \pm 0.74
Nurses	4.61 \pm 0.58
Physicians	4.60 \pm 0.60
Room	4.22 \pm 0.59
Tests and treatments	4.49 \pm 0.55
Overall assessment	4.72 \pm 0.49
Overall score	4.47 \pm 0.45
Patient outcomes, n (%)	
30-day ED visit	45 (13.8%)
60 day ED visit	64 (19.6%)
90-day ED visit	83 (25.4%)
6-month ED visit	113 (34.6%)
30-day readmission	47 (14.4%)
60-day readmission	73 (22.3%)
90-day readmission	87 (26.6%)
6-month readmission	119 (36.4%)
6-month death	10 (3.1%)

Abbreviation: ED, emergency department.

Total Population Patient Satisfaction Scores and Outcomes

The overall patient satisfaction mean score for the surveyed population (N = 327) was high (4.47 ± 0.45). Among individual survey categories, patients were most satisfied with their inpatient nursing care (4.61 ± 0.58) and least satisfied with their inpatient meals (4.11 ± 0.74 ; Table 1).

Rates of ED visits and readmission within 30 days post-discharge were 13.8% and 14.4%, respectively. Within 6 months, these rates increased to 34.6% and 36.4%. Additionally, 10 (3.1%) patients died within 6 months (Table 1).

Patient Satisfaction and Demographic Correlations

When analyzing the relationship between patient satisfaction and demographics, race was positively correlated with patient satisfaction in nursing care, with White patients reporting higher satisfaction than non-White patients ($P = .03$, correlation coefficient [CC] = 0.120; Table 2). No other significant correlations were seen between demographics and patient satisfaction.

Patient Satisfaction and Outcomes Correlations

Patient satisfaction was found to be negatively correlated to several adverse outcomes up to 6 months post-discharge. Patients who were readmitted within 90 days post-discharge had lower patient satisfaction with the discharge

Table 2. Correlation Between Patient Demographics and Outcomes and Average Patient Satisfaction Scores (*r*).

	Discharge	Personal issues	Visitors and family	Meals	Nurses	Physicians	Room	Tests	Overall assessment	Overall mean
Demographics										
Age	0.018	-0.006	-0.033	0.083	-0.044	0.041	0.059	-0.043	0.049	0.034
Gender	0.011	0.037	0.073	0.021	0.034	0.063	0.037	-0.013	0.004	0.01
Race—white	0.04	0.085	-0.035	0.037	.120 ^a	0.015	-0.004	0.099	0.035	0.062
SES—low	-0.009	-0.038	-0.036	-0.011	-0.105	-0.065	-0.062	-0.048	0.031	-0.031
Married	-0.036	0.07	0.07	-0.001	0.049	0.008	0.019	0.035	0.051	0.046
Charlson's comorbidity index	-0.077	-0.081	-0.069	0.045	-0.046	-0.005	0.021	-0.043	0.053	-0.042
Outcomes										
ED visit in 30 days	-0.007	-0.066	-0.039	0.051	-0.057	0.027	-0.013	-0.016	-0.057	-0.005
ED visit in 60 days	-0.003	-0.075	0.011	0.054	-0.082	0.061	0.028	-0.052	-0.042	-0.013
ED visit in 90 days	-0.021	-0.072	0.012	0.009	-0.046	0.05	0.04	-0.065	0.01	-0.028
ED visit in 6 months	-0.021	-.121 ^a	-0.012	0.009	-0.042	-0.012	-0.004	-0.059	-0.035	-0.052
Readmit in 30 days	-0.044	-0.065	-0.015	-0.017	-0.037	0.013	-0.014	-0.011	-0.012	-0.024
Readmit in 60 days	-0.09	-0.084	-0.01	-0.051	-0.092	0.019	-0.059	-0.049	-0.001	-0.075
Readmit in 90 days	-.111 ^{a,b}	-0.054	0.001	-0.053	-0.07	0.059	-0.066	-0.03	0.039	-0.064
Readmit in 6 months	-0.046	-0.077	0.005	-0.029	-0.046	0.026	-0.036	-0.032	0.019	-0.065
Death in 6 months	-0.017	-0.102	-0.054	-0.05	-0.072	-0.072	-0.024	-0.096	-.115 ^a	-0.093

Abbreviations: ED, emergency department; SES, socioeconomic status.

^a $P < .05$

^bExample: Higher patient satisfaction with discharge was correlated with lower readmission rates at 90 days post-discharge.

process ($P < .05$, $CC = -0.111$; Table 2). Additionally, patients who visited the ED within 6 months post-discharge reported lower satisfaction with how hospital staff handled personal issues ($P = .03$, $CC = -0.121$). Patients who died within 6 months were more likely to have reported lower overall satisfaction with their hospital admission ($P = .04$, $CC = -0.115$).

Ad Hoc Analysis

In response to the high readmission rates commonly seen among CHF patients (23), an ad hoc analysis evaluated the relationship between patient satisfaction and outcomes among patients admitted for CHF.

Overall, CHF patients with an ED visit within 30, 60, 90 days, and 6 months post-discharge reported higher satisfaction with their index hospital admission (Table 3). Higher satisfaction with the discharge process was seen among patients with an ED visit at all time points post-discharge ($P < .01$ for all). Patients with an ED visit within 30, 60, and 90 days post-discharge reported higher satisfaction with physicians ($P = .03$, $P = .02$, and $P = .02$, respectively). Patients with an ED visits within 30 days post-discharge also reported higher satisfaction with the admissions process, while patients with an ED visits within 90 days post-discharge reported higher overall satisfaction ($P = .02$ and $P = .04$, respectively). In addition, CHF patients with a readmission within 30 days post-discharge had higher satisfaction with the discharge process ($P < .05$; Table 3). No differences in patient satisfaction were seen between CHF patients who did and did not die within 6 months (Table 4).

Discussion

This study sought to determine whether a patient's satisfaction with their recent hospital admission could be used as a quality of care measure, by evaluating whether satisfaction scores were associated with patient outcomes. Beyond outcomes, this study also analyzed the relationship between demographics and satisfaction.

Patient Satisfaction and Race

In terms of the relationship between patient satisfaction and demographics, being non-White was associated with lower patient satisfaction with nursing care. Differences in patient satisfaction scores based on demographics, specifically race, have been repeatedly found in other studies (24,25). Different conclusions have been made regarding these findings, with some studies suggesting perceived racism, system mistrust, and different expectations of care are to blame for lower patient satisfaction, rather than actual care received. Some have even suggested adjusting patient satisfaction scores to control for demographic factors such as race (24,25). However, these conclusions may be ill-advised. More recent studies that look at subtler differences in health care provider behaviors have found racial differences in the way patients are treated; these behavioral differences have been correlated with differences in patient perceptions (26,27).

For example, Penner et al reported that, during videotaped patient sessions, oncologists spent less time with their Black patients compared to their White patients, and they used less patient-centered and supportive language (26). When patients were interviewed about their interactions

Table 3. Comparison of Mean Patient Satisfaction Score and Occurrence of an ED Visit or Readmission Post-Discharge in CHF Patients (Mean ± SD).

	ED visit in 30d (n = 12)		No ED visit in 30 days (n = 48)		ED visit in 60 days (n = 15)		No ED visit in 60 days (n = 45)		ED visit in 90 days (n = 21)		No ED visit in 90 days (n = 39)		ED visit in 6 months (n = 28)		No ED visit in 6 months (n = 32)		Sig. (2-tailed)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Admissions	4.86 ± 0.32	4.42 ± 0.64	.02 ^a	4.79 ± 0.38	4.42 ± 0.65	.05 ^a	4.72 ± 0.38	4.39 ± 0.69	.09	4.63 ± 0.41	4.40 ± 0.74	.4					
Discharge	4.69 ± 0.39	4.09 ± 0.74	<.01 ^a	4.64 ± 0.41	4.06 ± 0.75	<.01 ^a	4.56 ± 0.48	4.02 ± 0.77	<.01 ^a	4.47 ± 0.58	3.97 ± 0.76	<.01 ^a					
Personal issues	4.56 ± 0.47	4.35 ± 0.55	.21	4.53 ± 0.42	4.35 ± 0.57	.28	4.53 ± 0.48	4.32 ± 0.56	.12	4.46 ± 0.48	4.33 ± 0.58	.43					
Visitors and family	4.61 ± 0.47	4.45 ± 0.53	0.53	4.60 ± 0.44	4.44 ± 0.54	.41	4.60 ± 0.44	4.41 ± 0.55	.28	4.58 ± 0.44	4.39 ± 0.57	.3					
Meals	4.22 ± 0.66	4.02 ± 0.72	.48	4.24 ± 0.64	3.99 ± 0.73	.33	4.25 ± 0.57	3.95 ± 0.76	.19	4.23 ± 0.62	3.90 ± 0.76	.12					
Nurses	4.61 ± 0.47	4.45 ± 0.57	.44	4.55 ± 0.54	4.46 ± 0.56	.61	4.59 ± 0.50	4.43 ± 0.58	.29	4.60 ± 0.45	4.38 ± 0.61	.18					
Physicians	4.84 ± 0.43	4.51 ± 0.77	.03 ^a	4.85 ± 0.39	4.48 ± 0.78	.02 ^a	4.80 ± 0.46	4.45 ± 0.81	.02 ^a	4.61 ± 0.64	4.54 ± 0.79	.48					
Rooms	4.12 ± 0.54	3.96 ± 0.59	.4	4.16 ± 0.49	3.94 ± 0.60	.19	4.14 ± 0.48	3.91 ± 0.62	.13	4.03 ± 0.52	3.96 ± 0.64	.68					
Tests	4.67 ± 0.39	4.44 ± 0.57	.17	4.67 ± 0.37	4.42 ± 0.58	.16	4.65 ± 0.38	4.40 ± 0.60	.12	4.6 ± 0.40	4.37 ± 0.62	.12					
Overall assessment	4.85 ± 0.21	4.64 ± 0.49	.42	4.87 ± 0.19	4.62 ± 0.49	.24	4.89 ± 0.18	4.57 ± 0.51	0.04 ^a	4.78 ± 0.36	4.60 ± 0.51	.23					

	Readmit in 30 days (n = 14)		No readmit in 30 days (n = 46)		Readmit in 60 days (n = 22)		No readmit in 60 days (n = 38)		Readmit in 90 days (n = 28)		No readmit in 90 days (n = 32)		Readmit in 6 months (n = 35)		No readmit in 6 months (n = 25)		Sig. (2-tailed)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Admissions	4.69 ± 0.60	4.45 ± 0.62	.13	4.67 ± 0.53	4.42 ± 0.65	.12	4.59 ± 0.57	4.43 ± 0.65	.34	4.59 ± 0.55	4.40 ± 0.69	.3					
Discharge	4.45 ± 0.80	4.14 ± 0.69	<.05 ^a	4.34 ± 0.75	4.14 ± 0.71	.18	4.27 ± 0.74	4.16 ± 0.71	.44	4.28 ± 0.74	4.11 ± 0.69	.23					
Personal issues	4.56 ± 0.47	4.35 ± 0.53	.28	4.50 ± 0.46	4.33 ± 0.57	.28	4.48 ± 0.47	4.31 ± 0.58	.27	4.47 ± 0.45	4.29 ± 0.64	.38					
Visitors and family	4.56 ± 0.47	4.45 ± 0.53	.65	4.50 ± 0.46	4.67 ± 0.55	.98	4.46 ± 0.53	4.50 ± 0.52	.84	4.47 ± 0.51	4.50 ± 0.54	.95					
Meals	4.23 ± 0.80	4.00 ± 0.68	.27	4.09 ± 0.80	4.04 ± 0.66	.73	4.06 ± 0.74	4.06 ± 0.69	1	4.05 ± 0.75	4.08 ± 0.66	.94					
Nurses	4.57 ± 0.46	4.46 ± 0.58	.57	4.52 ± 0.49	4.47 ± 0.59	.89	4.47 ± 0.55	4.50 ± 0.56	.9	4.50 ± 0.52	4.46 ± 0.60	.77					
Physicians	4.82 ± 0.39	4.50 ± 0.78	.16	4.75 ± 0.42	4.47 ± 0.84	.37	4.75 ± 0.41	4.42 ± 0.90	.29	4.69 ± 0.47	4.42 ± 0.97	.97					
Rooms	4.15 ± 0.39	3.94 ± 0.62	.26	4.09 ± 0.50	3.94 ± 0.62	.37	3.98 ± 0.63	4.01 ± 0.55	.9	3.96 ± 0.62	4.04 ± 0.54	.93					
Tests	4.68 ± 0.36	4.43 ± 0.58	.15	4.56 ± 0.42	4.44 ± 0.60	.71	4.48 ± 0.57	4.49 ± 0.53	.99	4.52 ± 0.54	4.44 ± 0.55	.47					
Overall assessment	4.87 ± 0.20	4.63 ± 0.49	.2	4.81 ± 0.31	4.61 ± 0.50	.29	4.81 ± 0.33	4.58 ± 0.51	.12	4.78 ± 0.36	4.55 ± 0.53	.09					

Abbreviations: CHF, congestive heart failure; ED, emergency department.

^a P < .05.

Table 4. Comparison of Mean Patient Satisfaction Score and Occurrence Death Post-Discharge in CHF Patients (Mean \pm SD).

	Death in 6 months (n = 3)	No death in 6 months (n = 57)	Sig. (2-tailed)
Admissions	4.33 \pm 0.58	4.52 \pm 0.63	.46
Discharge	4.13 \pm 0.19	4.22 \pm 0.74	.54
Personal issues	4.07 \pm 0.43	4.41 \pm 0.54	.24
Visitors and family	4.31 \pm 0.23	4.49 \pm 0.54	.65
Meals	4.22 \pm 0.51	4.06 \pm 0.73	.78
Nurses	4.42 \pm 0.14	4.49 \pm 0.57	.46
Physicians	4.11 \pm 1.11	4.61 \pm 0.71	.12
Room	4.06 \pm 0.51	3.99 \pm 0.59	.86
Tests	4.43 \pm 0.14	4.49 \pm 0.56	.29
Overall assessment	4.29 \pm 0.51	4.71 \pm 0.44	.07

Abbreviation: CHF, congestive heart failure.

afterward, Black patients were more likely to rate their physician's communication as poor and less patient-centered than their White counterparts, in accordance with the physician behaviors displayed in the recordings (26). The differences in patient satisfaction by race seen in this study may be attributable to differences in the treatment patients received; therefore, patient satisfaction can potentially be used to help health systems identify ways to improve health equity.

Patient Satisfaction and Patient Outcomes

In this study, there was a significant, but weak, correlation in the overall population showing that patients who were more satisfied with their hospitalization were less likely to visit the ED, be readmitted, or die within 6 months post-discharge. While no causal relationship can be determined from these data, there are several different possibilities to explain these results.

Patient satisfaction with their overall experience, discharge process, and with staff handling of personal issues were specifically related to better post-discharge outcomes. Although our study did not directly assess the effects of nursing communication on patient satisfaction or outcomes, these sections of the patient satisfaction survey all have components that evaluate patient-staff interactions and communication. This may suggest that better outcomes were seen because there was better communication and patient education. Prior studies have concluded that patient satisfaction with hospital staff interactions suggests more patient-centered care (16) which in turn has been associated with better outcomes (28). Additionally, nursing communication, specifically, has been associated with increased patient satisfaction with hospital stays (29), which we have seen in this study to also be associated with better outcomes.

Another possible factor contributing to the relationship between satisfaction and outcomes is the state of the disease process in the patient. It is possible that patients' evaluations of their hospital experiences were influenced by improvement of symptoms or overall prognosis. Meaning, it could be the case that those who were healthier upon discharge, and less likely to have poorer post-discharge outcomes, were also

more likely to have higher patient satisfaction. This hypothesis is supported by a previous study which found a relationship between symptom improvement and higher patient satisfaction (30).

Patient Satisfaction and Outcomes in CHF Patients

In contrast to the overall population in this study, the opposite relationship between patient satisfaction and outcomes was seen among CHF patients: patients with poorer outcomes (ED visits and readmissions) reported higher satisfaction. These results are also dissimilar to those of Boulding et al, which found a relationship between higher satisfaction and a lower likelihood of 30-day readmission (16). There are several possible explanations for these findings.

First, due to our small population size, adjusting for risk based on disease severity was not possible; however, Boulding et al were able to risk-adjust their results, potentially yielding different results (16). This suggests that when evaluating patient satisfaction in relation to quality of care and outcomes, it may be necessary to control for disease severity and diagnosis-specific outcomes, as these factors may not be controllable despite good medical care. This study's results may also differ from Boulding et al due to the difference in outcomes being measured, as we broadened our study to evaluate ED visits, which yielded the majority of the significant relationships with patient satisfaction.

The CHF population findings in this study may also be suggesting a link between patient satisfaction and loyalty. In populations with higher disease severity that will inevitably require more medical attention, such as CHF, the relationship between higher satisfaction and returning to the same hospital or ED may be due to the patient trusting the institution enough to return when needed. This theory is in accordance with a study by Kessler et al, which found a relationship between patient satisfaction with their hospitalization and further loyalty to that institution (31).

Similar to the overall population in this study, higher patient satisfaction in CHF patients may also be associated with better patient-staff communication and patient education. Since higher patient satisfaction was mostly associated

with higher rates of ED visits, these results could be indicating that discharge instructions were detailed enough for patients to recognize symptoms indicative of needing to seek medical attention and respond early enough to prevent rehospitalization.

Limitations

This study has several limitations. First, the use of surveys sent via a third party to random eligible patients resulted in a small sample size. Since we cannot know how many eligible patients were sent surveys, it was impossible to evaluate response rates. However, based on internal statistics from the institution's Quality Analytics Department, average survey response rates for the institution are around 20%, which is similar to the HCAHPS national response rate of 22% in 2016 to 2017 (32).

This is a retrospective study which cannot speculate causality and may lead to results that are not generalizable. Additionally, results may further not be generalizable due to the data only assessing one health system. It is possible ED visits or hospitalizations at outside hospitals may not have been inputted in the BRIDGE database and thus not included in the analysis.

Our data were also limited in that we only recorded the first ED visit and/or readmission occurrence. Thus, we were unable to analyze whether a correlation existed between patient satisfaction and number of ED visits and hospitalizations post-discharge.

Conclusions

Overall, this study suggests that patient satisfaction can be a tool to measure quality of care. However, patient satisfaction may be better suited to measure quality in conjunction with a variety of other measures, including outcome-based measures, especially when being used to determine quality-based pay or reimbursement. Additionally, patient satisfaction scores may need to be interpreted differently for different patient populations, as severity of disease and other factors can play a role in outcomes. That said, patient satisfaction may be used to improve population-specific experiences and outcomes, such as those of minority patients. To further generalize these results, this study would benefit from being repeated with a larger sample size, more disease processes, and across multiple institutions.



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