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Abstract

The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey has become a key metric used by organizations and patients to evaluate patient experience. Readmissions also continue to be a metric used to evaluate performance because of the added cost to both healthcare systems and patients. Both measures are also seen in programs such as Value Based Purchasing that have an effect on hospital reimbursements. Previous studies have demonstrated a relationship between patient perceptions and quality of care, and have found patients to be reliable evaluators of their care. While good communication and positive provider relationships have been related to higher satisfaction and higher rates of treatment compliance, past research has been limited to evaluating the relationship between readmissions and satisfaction at an organizational level. This retrospective, cross-sectional study will examine the relationship between communication and discharge HCAHPS questions and readmissions at 30 days, specifically at the patient level. Of the eight HCAHPS questions analyzed, higher scores on questions regarding “nurses listening” and “doctors explaining information” were linked to a decreased risk of readmission, while higher scores regarding “help after discharge” were linked to an increased risk for readmission. These results show the importance that a patient’s severity of illness and hospital procedures have on explaining HCAHPS results. This study’s seemingly paradoxical findings suggest the need to recognize potential trade-offs when reviewing HCAHPS results and using them to drive patient experience initiatives.

Keywords

Patient experience, patient satisfaction, HCAHPS, quality of care, communication, readmissions, discharge

Introduction

Patient satisfaction is an important issue in healthcare, as it functions as a measure of success and quality. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey serves as a standard measure of patient experience by the Centers for Medicare and Medicaid Services (CMS). HCAHPS survey data have been publically available since March of 2008, which have facilitated standardized comparisons across organizations. Not only has the HCAHPS survey served as a standard set of measures for reporting, but it has also served as an incentive for improving scores and increasing transparency among providers.¹ Patient satisfaction scores serve as a key quality metric to guide quality improvement initiatives.²

Along with public reporting, HCAHPS scores are now being used by CMS for the Value-Based Purchasing Program (VBP). Beginning in fiscal year 2013, hospitals

have received VBP scores based on quality performance. VBP scores will affect up to 2% of financial reimbursements that organizations receive, and will be based on how hospitals perform on each measure, and the level of improvement for each measure. HCAHPS scores will account for 30% of the total VBP score hospitals receive, while clinical, outcome, and efficiency measures will account for the other 70%.³

In addition to patient experience, reducing readmissions is a focus for hospitals. Readmissions are a significant burden not only on the healthcare system, but also on individual patients. Estimates are that 20% of discharged Medicare beneficiaries are readmitted within 30 days, which accounted for over \$15 billion in excess costs in 2009.⁴ The Readmission Reductions Program instituted by CMS in 2012 will now adjust payments based on readmissions.⁵ Preventable readmissions serve as a

significant indicator of the quality of a healthcare interaction.

Higher satisfaction with care has been associated with lower inpatient mortality^{6,7,8}, better adherence to practice guidelines^{7,9,10}, lower healthcare utilization¹¹, improved health status at discharge¹², reduced readmissions⁹, and lower risk of physician lawsuits¹³. Patients with a self-reported poor care experience measure had twice the risk of an adverse event or medical error being documented in the chart.¹⁴ Work by Press Ganey has shown that organizations with lower HCAHPS VBP scores and higher readmission penalties are also more likely to have lower VBP scores related to clinical measures.¹⁵ These results indicate that technical aspects of care and quality may only explain part of the patient experience, and that patient satisfaction scores are another indicator of their care quality.

Patients with higher “willingness to recommend” scores are more likely to provide positive ratings for their experience with interpersonal interactions and communication with medical staff.¹⁶ Physician-patient communication has an impact on emotional health, decreased symptom manifestation, increased functioning, and decreased pain.¹⁷ A patient who feels he or she is “known as a person” by his/her physician is more likely to complete and comply with a treatment regimen.¹⁸ In several studies, where patient satisfaction (measured by an overall satisfaction question) and quality were correlated, individual survey questions regarding communication and staff behavior had the strongest association with the overall satisfaction.^{8,9}

A 2011 study by Boulding, et al. showed that an organization’s overall satisfaction rating has a negative correlation to its readmission rate.⁹ The study was conducted using hospital level data, which provides a high level perspective on the care experience. The investigators found that patient satisfaction measures used in the study were actually more predictive of readmissions than the clinical variables used and that communication was the strongest predictor of patient outcomes. The study focused on the general reliability of CMS data as a measure of hospital performance. The clinical and satisfaction data being compared were publically available and not necessarily linked to the same time period, precluding an assessment of causality.

With CMS introducing VBP and the Readmissions Reduction Program, there is an opportunity to improve both quality and patient satisfaction, and tie improvements to direct financial benefit. This serves to justify and lead an organization’s efforts to improve care quality. Thus, this study will investigate the relationship between nurse communication, physician communication, and

information regarding discharge HCAHPS domains and 30-day readmissions at an individual patient level.

This current study expands on the existing literature by focusing on patient-level HCAHPS and readmission information, as opposed to high-level organizational data. Data that link patient experience to clinical data are not widely available, and provide a unique dataset for use in this study. Patients have unique encounters, and so it is important to assess them individually. Secondly, as a relationship exists between good communication and quality care, this study specifically investigated a patient’s perception of provider communication and discharge information and its relationship to readmission rates. Good provider communication is essential to a patient-provider relationship and should have an effect on patient compliance and health outcomes after discharge. This study hypothesizes that patients who report higher scores for communication HCAHPS questions will have a lower risk for readmission within 30 days.

Methods

This study is a retrospective, cross-sectional study of patients (n = 30,968) who were treated at 10 different hospitals. All patients in this sample received and returned an HCAHPS survey. An HCAHPS survey is administered by hospitals and is sent to a random sample of discharged inpatients age 18 or older anytime between 2 days to 6 weeks after discharge. There were 877 patients excluded from our dataset: patients who were classified as observation patients, and patients who were transitioned to a different level of care by being discharged and readmitted on the same day.

HCAHPS and discharge data came from 10 different organizations sharing information with University HealthSystem Consortium (UHC), a non-profit group of academic medical centers across the United States. Data were obtained from the UHC clinical database, a collection of quality measures reported to UHC by member institutions from across the country. HCAHPS scores and quality measures were matched by UHC using medical record number, encounter number, and readmission and discharge dates. Institutional Review Board approval was obtained for this study from Rush University Medical Center IRB Committee.

Variables analyzed in this study were the eight HCAHPS questions about nurse communication, physician communication, and discharge communication. These questions are shown in *Table 1*. Responses to each of these questions were coded into two categories: top-box responses, and all other responses. The top-box responses included patients who answered either “always” or “yes”, depending on the type of question.

The APR-DRG Grouper, developed by 3M Health Information Systems, is used by UHC to determine the severity of illness (SOI) variable. The patient DRGs were grouped into a binomial variable and classified as either medical or surgical in nature. Initial admission length of stay (LOS) was also considered. Socio-demographic factors included patient age, patient gender, and patient payer (Medicare, Medicaid, Commercial, and Other).

SPSS Statistical Package 18 was used for data management and analysis.

The relationship between LOS and 30 day readmission was analyzed using an independent t-test. The relationship between the HCAHPS question scores, severity of illness, DRG, age, gender, and payer variables and readmission were analyzed using a chi square test. A binary logistic regression was used to test the relationship between each HCAHPS question and readmission while controlling for the clinical and socio-demographic variables.

Results

Readmission rates for the 10 hospitals in the dataset varied from 7.6% to 10.6%, with an average readmission rate of 9.3%.

Descriptive data are summarized in *Table 2*. *Table 2* also shows the results of the bivariate analysis. All clinical and demographic variables included in this study were found to be significantly associated with readmission at 30 days. The majority of both readmitted and non-readmitted patients were female. More than a third (34.8%) of both readmitted and non-admitted patients were aged 55 – 69 years. Medicare patients accounted for the majority of non-readmitted and readmitted patients. Most patients who were readmitted had a medically classified DRG. Moderate severity of illness at admission accounted for most readmitted and non-readmitted patients. The average length of stay on initial admission for non-readmitted patients was 4.14 ± 4.9 days and 5.81 ± 6.9 days for readmitted patients.

Of the eight HCAHPS questions analyzed in the study, the percentage of top box responses ranged from 70-89% per item. The study had predicted that higher HCAHPS communication scores would be associated with lower 30-day readmission rates. Six of the eight items analyzed in this study were found to be significantly associated with 30-day readmission. Two of the HCAHPS questions (relating to “help after discharge” and “receiving written information after discharge”) had higher top box responses for readmitted patients than non-readmitted patients. All HCAHPS questions were subsequently included in the multivariate analysis.

Table 3 shows the results of the binary logistic regression. Because of the exploratory nature of the study and inclusion of all variables, a corrected p-value of $p < 0.01$ was used to reduce the type-I error rate. Three of the eight HCAHPS questions analyzed in this study were found to be significant predictors of readmission in 30 days. For two of the questions, “During this hospital stay, how often did the nurses listen carefully to you?” (OR 0.821, $p = .003$, CI 0.721-0.935), and “During this hospital stay, how often did doctors explain things in a way you could understand?” (OR 0.819, $p = .002$, CI 0.721-0.931), patients who responded with a higher top-box score were less likely to be readmitted within 30 days. For one question: “During this hospital stay, did doctors, nurses or other hospital staff talk with you about whether you would have the help you needed when you left the hospital?” (OR 1.289, $p < .001$, CI 1.120-1.484), patients who responded with a higher top-box response were found to be more likely to be readmitted within 30 days.

Discussion

This study hypothesized that patients who reported higher scores on HCAHPS communication questions would have a lower risk for readmission within 30 days. Our results show a mixed association between readmission and HCAHPS items. Of the eight questions analyzed, four of the questions were significantly associated with readmission. Two of the questions (“During this hospital stay, how often did the nurses listen carefully to you?” and “During this hospital stay, how often did doctors explain things in a way you could understand?”) showed that those patients who responded with “always” had 18% *lower* odds for readmission within 30 days. However, one of the questions (“During this hospital stay, did doctors, nurses or other hospital staff talk with you about whether you would have the help you needed when you left the hospital?”) showed that those patients with a response of “Yes” actually had 30% *higher* odds for readmission within 30 days.

In the analysis, it was found that a statistically significant association existed between severity of illness (SOI) and 30-day readmission. In the sample, as expected, patients with a higher severity of illness at admission had a significantly higher risk of being readmitted in 30 days. For the discharge question assessing “help after discharge,” more patients with extreme severity of illness answered “yes” to this question than expected, and more patients than expected with mild severity of illness answered “no” to this question. This brings up several interesting possibilities. Those patients who are admitted with a higher SOI are likely to need more help because they are starting off in a worse condition. Thus, these patients may receive more attention from nurses and therefore perceive a better nurse relationship and treatment. Also, a patient with a higher SOI is likely to be

more alert to his or her situation and needs, and be more willing to listen and interact with staff. Patients with high SOI are identified as high risk by staff, and again are more likely to be the focus of extra discharge planning. While identifying patients as high risk and in need of special attention is important, extra attention may explain the higher HCAHPS scores being tied to higher readmission. These relationships require additional exploration.

There were several limitations to this study. First, there are many factors that impact a patient's risk of being readmitted that have not been accounted for in this study. These include other socio-demographic factors and previous admissions in the year. Also, the dataset did not differentiate between scheduled or emergency surgeries or admissions. Moreover, this dataset only includes readmission information if a patient was readmitted to the same facility. It is possible that some patients categorized as not readmitted were readmitted elsewhere. Generally, HCAHPS surveys have a low response rate. Thus, the sample used in this study may represent a specific segment of the population and results may not be generalizable. Finally, because of the survey process, there may be patients who returned HCAHPS surveys regarding their initial admission after their second discharge. Thus they may have been filling out the survey regarding their readmission experience rather than their initial admission. This potential effect is a result of the timing of survey administration across all institutions, and thus not specific to our sample.

This study points to several areas for future research. Although CMS creates domains from specific questions, differences exist among questions, indicating value in looking at individual questions. More research needs to be done to explore what influences a patient's response to HCAHPS questions based on their interpretation of the questions. Also, it is important to explore why differences exist between nurse and physician questions, and what that might indicate about those patient/provider relationships.

While there are limitations to the HCAHPS survey, it nonetheless provides valuable data regarding aspects of organizational performance. It should be used with an understanding that HCAHPS scores are influenced by a number of factors and are only one indicator of a patient's experience.¹⁹ It is also important to note that the doctor and nurse questions do not ask specifically about one provider or care team member, but rather of all the members of those groups (i.e., all doctors or all nurses who cared for patient). Thus, it is unclear whether the patient is rating the best provider, worst provider, or an average.

This study raises important considerations for hospital administrators. It is important to remember that many specific hospital processes may have unintended positive

or negative effects on HCAHPS scores. Although these relationships exist within the dataset, it is critical to explore organization specific results and whether these results pertain to an organization before making any changes. Administrators should recognize that providers often recognize individual patient characteristics and adjust their communication style and content to address risks. Allocating additional resources to patients who are recognized to be at risk may reduce future readmissions. Also, this study highlights the ability to use analytics to drive patient experience initiatives.

Finally, future research may consider exploring the relationship that exists between communication as measured by the HCAHPS and readmissions. Using patient experience data highlights important relationships with clinical data that can be used to help drive patient satisfaction initiatives to improve patient quality and experiences.

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Table 1: HCAHPS Questions Regarding Communication and Discharge Satisfaction

Question Label	HCAHPS Survey Question	Top Box Response
Nurse Communication		
Nurse Courtesy and Respect	During this hospital stay, how often did the nurses treat you with courtesy and respect?	”Always”
Nurses Listen	During this hospital stay, how often did the nurses listen carefully to you?	
Nurses Explain	During this hospital stay, how often did nurses explain things in a way you could understand?	
Physician Communication		
Doctors Courtesy and Respect	During this hospital stay, how often did the doctors treat you with courtesy and respect?	”Always”
Doctors Listen	During this hospital stay, how often did the doctors listen carefully to you?	
Doctors Explain	During this hospital stay, how often did doctors explain things in a way you could understand?	
Discharge Communication		
Talk about Help after Discharge?	During this hospital stay, did doctors, nurses or other hospital staff talk with you about whether you would have the help you needed when you left the hospital?	”Yes”
Receive Information in Writing?	During this hospital stay, did you get information in writing about what symptoms or health problems to look out for after you left the hospital?	

Table 2 – Summary of Clinical, Demographic, and HCAHPS Variables by Readmission Status

	Readmitted No		Readmitted Yes		p-value
	(N)	%	(N)	%	
Age					X ² (2, 30,091) = 9.829, p = .007
≤ 54	9003	33.0%	850	30.4%	
≥ 55 - < 70	9493	34.8%	972	34.8%	
≥ 70	8803	32.2%	970	34.7%	
Gender					X ² (1, 30,091) = 13.639, p< .001
Male	12339	45.2%	1364	48.9%	
Female	14960	54.8%	1428	51.1%	
Payer					X ² (3, 30,091) =110.477, p< .001
Commercial	9763	35.9%	781	28.0%	
Medicare	12977	47.5%	1561	55.9%	
Medicaid	2491	9.1%	307	11.0%	
Other	2038	7.5%	143	5.1%	
DRG					X ² (1, 30,091) =229.477, p<0.001
Medical	13600	49.8%	1811	64.9%	
Surgical	13699	50.2%	981	35.1%	
SOI at Admit					X ² (3, 30,091) =592.327, p<0.001
Mild	9406	34.5%	467	16.7%	
Moderate	10822	39.6%	1081	38.7%	
Major	6233	22.8%	1040	37.2%	
Extreme	838	3.1%	204	7.3%	
Nurse Courtesy and Respect					X ² (1, 28411) = 0.299, p = 0.584
Score 1-3	3950	15.3%	411	15.7%	
Score 4	21846	84.7%	2204	84.3%	
Nurses Listen					X ² (1, 28473) = 15.960, p<.001
Score 1-3	6371	24.6%	740	28.2%	
Score 4	19477	75.4%	1885	71.8%	
Nurses Explain					X ² (1, 28450) = 9.975, p = .002
Score 1-3	6472	25.1%	732	27.9%	
Score 4	19352	74.9%	1894	72.1%	
Doctors Courtesy and Respect					X ² (1, 28421) = 17.262, p < .001
Score 1-3	3498	13.5%	423	16.1%	
Score 4	22326	86.5%	2200	83.9%	
Doctors Listen					X ² (1, 28421) = 17.262, p< .001
Score 1-3	5410	21.0%	643	24.5%	
Score 4	20382	79.0%	1986	75.5%	
Doctors Explain					X ² (1, 28454) = 43.229, p<.001
Score 1-3	6195	24.0%	782	29.8%	
Score 4	19633	76.0%	1844	70.2%	
Talk about help after Discharge?					X ² (1, 27024) = 13.223, p<.001
No	3494	14.2%	286	11.6%	
Yes	21058	85.8%	2186	88.4%	
Receive Information In Writing?					X ² (1, 26992) = 0.372, p = 0.542
No	2686	11.0%	280	11.4%	

	Readmitted No		Readmitted Yes		
	(N)	Mean ± SD	(N)	Mean ± SD	
LOS (days)	27299	4.14 ± 4.9	2792	5.81 ± 6.9	t (3083) = -12.400, p < .001

Table 3 – Multivariate Relationship between Clinical, Demographic, and HCAHPS variables and Readmission (* = Significant P-Value)

Explanatory Variable	Readmitted No/Yes (Yes=1)	Exp (B)	95% CI for Exp (B) (Lower-Upper)	p-value
	B			
LOS	0.030	1.030	1.023-1.037	*<0.001
Age (Years)				
≤ 54				
≥ 55 - < 70	-0.043	0.958	.853-1.076	0.472
≥ 70	-0.167	0.846	.731-.979	0.025
Gender				
Male				
Female	-0.116	0.891	.815-.973	*0.010
Payer				
Commercial				
Medicare	0.280	1.323	1.166-1.500	*<0.001
Medicaid	0.204	1.226	1.045-1.438	*0.012
Other	-0.225	0.799	.649-.983	0.034
DRG				
Medical				
Surgical	-0.492	0.612	.555-.674	*<0.001
SOI at Admit				
Mild				
Moderate	0.533	1.704	1.506-1.927	*<0.001
Major	0.880	2.412	2.111-2.755	*<0.001
Extreme	1.134	3.109	2.511-3.848	*<0.001
Nurse Courtesy and Respect				
Score 1-3				
Score 4	0.167	1.182	1.016-1.376	0.031
Nurses Listen				
Score 1-3				
Score 4	-0.197	0.821	.721-.935	*0.003
Nurses Explain				
Score 1-3				
Score 4	0.016	1.016	.896-1.1522	0.808
Doctors Courtesy and Respect				
Score 1-3				
Score 4	-0.041	0.959	.818-1.126	0.611
Doctors Listen				
Score 1-3				
Score 4	0.021	1.021	.882-1.182	0.779
Doctors Explain				
Score 1-3				
Score 4	-0.199	0.819	.721-.931	*0.002
Talk about help after Discharge?				
No				
Yes	0.254	1.289	1.120-1.484	*0.000
Receive Information In Writing?				
No				
Yes	0.031	1.031	.892-1.192	0.679