BRIEF REPORTS

The Effect of Primary Care Training on Patient Satisfaction Ratings

Bruce D. Bialor, MD, Phyllis A. Gimotty, PhD, Roy M. Poses, MD, Mark J. Fagan, MD

This study examines the association between type of internal medicine training and satisfaction ratings among 509 patients who visited the clinic of an urban teaching hospital over a 3-month period in 1994. When controlling for patient, health-system, and other resident factors, primary care training was significantly associated with higher satisfaction ratings (cumulative odds ratio 1.53; 95% confidence interval 1.04, 2.25; $p = .031$) than categorical training. Using satisfaction ratings to rank the residents without adjusting for patient and health-system factors would have correctly classified only 27% of the residents in the lowest quartile. These findings have implications for both the education and potential employment of internists.

KEY WORDS: **patient satisfaction; resident evaluation; ambulatory care; physician-patient relationship.**
J GEN INTERN MED 1997;12:776–780.

Patient satisfaction has become an important outcome in ambulatory medicine, both as a measure of the quality of care[1] and, in some managed care settings, as a method of providing financial incentives for physicians.[2] It has also been used to assess the interpersonal skills of internal medicine residents,[3–5] especially since the American Board of Internal Medicine (ABIM) developed its own Patient Satisfaction Questionnaire (PSQ) in the late 1980s.[5] Many authors have found that variables related to the patient,[5–12] physician,[4,6,9] and health system[6,7,9–11] can affect patient satisfaction ratings; as a result, one needs to adjust for these variables when trying to rank physicians according to their satisfaction ratings.[6,11]

One physician variable for which the data are limited is primary care training. One study showed that after controlling for residents' gender, primary care training was not significantly associated with increased patient satisfaction; however, the analysis adjusted for only a limited number of patient variables (i.e., age, gender, and insurance status) and did not adjust for any health-system variables.[4]

The main purpose of our study was to examine the effect of primary care training on the patient satisfaction ratings of internal medicine residents, after controlling for patient, health-system, and other resident variables. Our hypothesis was that primary care residents would receive higher satisfaction ratings than categorical residents. Our secondary purpose was to assess the effect of adjusting for patient and health-system variables on the ranking of residents according to their satisfaction ratings, to illustrate the importance of controlling for these variables.

METHODS

Setting and Data Collection

The study was conducted over a 3-month period in 1994 in the internal medicine clinic of an urban teaching hospital. All internal medicine and first-year obstetrics/gynecology residents were eligible. Patients who were scheduled to see a resident were asked to anonymously complete previsit and postvisit surveys. The former asked for demographic, socioeconomic, and health-related information, plus reasons for visiting and health care utilization in the past year; this was similar to a previously used instrument.[6] The latter included a version of the 10-item ABIM PSQ,[5] which was altered after pilot testing to improve patient understandability (Appendix A); it also asked for waiting time and visit length. Patients were excluded if they had completed the survey earlier in the study period.

Data Analysis

We calculated a mean rating of the items in the PSQ (on a scale of 1 to 5, where 1 = poor and 5 = excellent) for each patient. Patients who rated fewer than four items were excluded from the analysis.[6] The mean ratings clustered around the integer values; consequently we converted

Received from the Division of General Internal Medicine, Wayne State University School of Medicine, Detroit, Mich. (BDB, PAG); Division of General Internal Medicine, Memorial Hospital of Rhode Island, Pawtucket (RMP); Division of General Internal Medicine, Rhode Island Hospital (MJF); and Brown University School of Medicine (RMP, MJF), Providence, RI.

Supported by the Department of Medicine, Rhode Island Hospital, Brown University School of Medicine. During this study, Dr. Bialor was a Fellow in General Internal Medicine at Rhode Island Hospital.

Presented in part at the 18th annual meeting of the Society of General Internal Medicine, San Diego, Calif., May 4–6, 1995.

Address correspondence and reprint requests to Dr. Bialor: Wayne State University Health Center, 4201 St. Antoine, Pod 5C, Detroit, MI 48201.

each mean rating into an ordinal satisfaction score, where 1 = 1.00–1.99, 2 = 2.00–2.99, 3 = 3.00–3.99, 4 = 4.00–4.99, and 5 = 5.00. We used the satisfaction score as the outcome variable for both bivariate and multivariate ordinal logistic regression analyses,[13] to obtain unadjusted and adjusted estimates of association between satisfaction score and the patient, resident, and health-system variables.

The variables we included in the models were either significant bivariate predictors of satisfaction score ($p < .05$) or those we thought might be significant multivariate predictors based on a priori hypotheses from previous studies.[4–12] The patient variables were age, gender, socioeconomic status, health status, number of reasons for the visit, and complexity (an indicator based on the number of daily medications and number of medical problems). The resident variables were gender, year of training, and type of training (primary care vs. categorical). The health-system variables were waiting time, visit length, and health service utilization (an indicator based on length of time in the practice, as well as providers seen, hospital admissions, and visits in the past year).

We used the cumulative odds ratio as the estimate of association between satisfaction score and each predictor variable. This is the ratio of the odds of a satisfaction score greater than or equal to x to the odds of a satisfaction score less than x where x can be either 5, 4, 3, or 2, for one group versus the referent group; for continuous predictor variables, the comparison is between the larger and smaller of two adjacent groups.[14] The intercepts from this model are related to the estimates of the cumulative probabilities of the level of the ordinal response variable for patients who are in the referent group for all independent variables in the model.

We restricted the last part of the analysis to those residents with at least six satisfaction scores. The purpose of this analysis was to illustrate the effect of adjusting for the patient and health-system variables from the model on the ranking of residents according to their satisfaction scores. We determined each patient's adjusted satisfaction score by summing each possible level of satisfaction score (i.e., 1–5) weighted by the estimated probability of that level; these probabilities were determined by the coefficients in the model. We then used a cutoff satisfaction score of 4 to determine the proportion of unadjusted and adjusted satisfaction scores ≥4 for each resident; they were then ranked into quartiles on the basis of these proportions.

RESULTS

Bivariate and Multivariate Comparisons

Of the 810 patients approached, 511 (63%) completed PSQs; 71 were not approached because the clinic was too busy. Two patients completed fewer than four items; this restricted the analysis to 509 patients.

A mean of 7.5 (SD 3.9) surveys per resident was collected for 68 residents. Of the residents, 31 (46%) of the 68 residents were in a primary care track and 34 (50%) were in a categorical track. The residents were approximately evenly divided by gender and year of training. The sociodemographic, clinical, and health-system characteristics of the respondents, as well as the residents' characteristics, are summarized in Table 1; the results of the bivariate comparisons with satisfaction score and the choice of variables for the multivariate models are also shown in Table 1. The results of the multivariate analysis are summarized in Table 2. Primary care training was independently associated with a higher satisfaction score, in addition to increasing years of training. The patient variables independently associated with higher satisfaction score were higher socioeconomic status, better health status, and fewer reasons for visiting; the health-system variables independently associated with higher satisfaction score were high utilization, shorter waiting time, and longer visit length.

Adjusted Rankings of Residents

Forty-three residents were rated by at least six patients. These patients accounted for 421 (83%) of the 509 in the study, for a mean of 9.8 surveys per resident for this subgroup. When we ranked these residents according to the proportion of unadjusted and adjusted satisfaction scores ≥4, 7 (22%) of the 32 residents in the highest three quartiles, using the adjusted satisfaction scores, would have been misclassified in the lowest quartile by using the unadjusted satisfaction scores. Similarly, only 3 (27%) of the 11 residents in the lowest quartile, using the adjusted satisfaction scores, would have been correctly classified by using the unadjusted satisfaction scores.

DISCUSSION

Our primary objective in this study was to examine the association between primary care training and patient satisfaction, while controlling for multiple other factors that can affect satisfaction ratings. We found that primary care training was associated with higher satisfaction ratings than categorical training. To our knowledge, this association has not been reported elsewhere in the teaching setting. Several factors may explain this association: these residents may be self-selected because of their interest in outpatient medicine, they receive additional training in interpersonal skills, and they have more outpatient experience during residency. These findings have implications both for educators and potential employers of internists. They suggest to the former that primary care training should expand to include more trainees; for the latter, they suggest that such training would be a desirable attribute in an applicant.

Our second objective was to assess the effect of adjusting for patient and health-system variables on the

Table 1. Patient, Health-System, and Resident Variables, and Bivariate Comparisons with Satisfaction Score

Characteristic	%	Mean Satisfaction Score ± SD	Variables Added to Regression
Patient variables			
Gender (n = 509)			
Male	33	3.99 ± 0.92*	Yes
Female†	67	3.74 ± 0.99	
Age‡ (*n* = 472)			
18–29	11	3.96 ± 0.73*	Yes
30–39	23	3.74 ± 0.96	
40–49	27	3.70 ± 1.03	
50–59	21	3.74 ± 1.04	
≥60	18	3.98 ± 0.96	
Education (*n* = 501)			
<High school graduate†	56	3.65 ± 0.99*	§
≥High school graduate	44	4.04 ± 0.91	
Income (*n* = 463)			
<$10,000 per year†	83	3.74 ± 0.99*	§
≥$10,000 per year	17	4.10 ± 0.89	
Employment (*n* = 490)			
Currently employed	13	3.95 ± 0.84	§
Not currently employed†	87	3.79 ± 0.99	
Socioeconomic status (*n* = 471)			
Low†‖	46	3.62 ± 1.01*	Yes
Not low	54	3.98 ± 0.93	
Health status¶ (*n* = 504)			
Poor†	23	3.62 ± 1.05*	Yes
Fair	57	3.75 ± 0.96	
Good	17	4.30 ± 0.76	
Excellent	2	4.18 ± 0.87	
Number of daily medications (*n* = 476)			
None†	11	4.06 ± 0.86*	#
1–3	59	3.75 ± 0.97	
4–6	24	3.84 ± 1.02	
7–16	6	3.83 ± 1.11	
Number of medical problems (*n* = 502)			
None†	7	4.11 ± 0.85*	#
1–3	53	3.91 ± 0.94	
4–12	40	3.63 ± 1.01	
Complexity (*n* = 487)			
Not complex†	51	3.91 ± 0.93	Yes
Complex**	49	3.72 ± 1.02	
Number of reasons for visiting¶ (*n* = 499)			
1†	56	4.05 ± 0.88*	Yes
2	32	3.48 ± 0.96	
3–5	13	3.69 ± 1.14	
Health-system variables			
Time followed in clinic (*n* = 507)			
First visit†	10	4.20 ± 0.80*	††
Up to 3 years	58	3.74 ± 0.97	
Over 3 years	32	3.86 ± 1.00	
Number of visits to clinic last year (*n* = 503)			
None†	18	4.04 ± 0.79*	††
One	7	4.09 ± 0.79	
2–7	46	3.61 ± 1.01	
>7	29	3.94 ± 0.98	
Hospital admissions in past year (*n* = 501)			
None†	58	3.91 ± 0.95*	††
1	26	3.63 ± 1.01	
>1	16	3.85 ± 0.99	
Number of different doctors seen anywhere in past year (*n* = 495)			
None†	12	3.98 ± 0.85	††
1–4	74	3.76 ± 0.97	
5–7	7	4.06 ± 0.94	
>8	7	3.89 ± 1.13	
Number of doctors/nurses seen in clinic in past year (*n* = 488)			††
First visitors†	9	4.21 ± 0.80*	
1	23	4.08 ± 0.84	
2–4	55	3.62 ± 1.01	
>4	13	3.93 ± 0.99	
Number of visits to any doctor in past year¶ (*n* = 439)			
None†	12	3.94 ± 0.86*	††
1–3	40	3.47 ± 1.00	
4–6	21	3.86 ± 0.89	
7–12	18	4.22 ± 0.88	
13–70	8	4.25 ± 0.81	
Health service utilization (*n* = 465)			
High utilizers‡‡	65	3.95 ± 0.96*	Yes
Not high utilizers†	35	3.62 ± 0.96	
Waiting time§§ (*n* = 482)			
0–30 min	49	4.10 ± 0.88*	Yes
31–60 min	41	3.52 ± 0.99	
>60 min	10	3.52 ± 0.94	
Visit length§§ (*n* = 448)			
0–30 min	77	3.69 ± 0.99*	Yes
31–60 min	21	4.10 ± 0.88	
>60 min	2	4.22 ± 0.67	
Resident variables			
Number of visits by resident characteristic (*n* = 509)			
Training type			
Primary care	51	3.88 ± 0.95	Yes
Categorical†	48	3.77 ± 0.99	
Obstetric/gynecological	1	4.14 ± 1.07	
Gender			
Male	43	3.79 ± 0.95	Yes
Female†‖	57	3.85 ± 0.96	
Year of training¶			
First†	30	3.74 ± 0.94	Yes
Second	28	3.84 ± 0.93	
Third or fourth	43	3.88 ± 1.02	

** Variables for which the comparison with mean satisfaction score was significant (p < .05).*
† Variables are the referent groups for analyses. Age, waiting time, and visit length were included in the models as continuous variables, so referent groups are not indicated for these variables.
‡ Mean age ± SD = 46.7 ± 14.0 years.
§ Variable included in the model as socioeconomic status.
‖ Low socioeconomic status indicates income <$10,000/year, education <high school graduate, and not employed.
¶ Percentages do not add up to 100 because of rounding.
 # Variable included in the model as the complexity variable.
*** Complex indicates >3 medical problems or >3 medications per day.*
†† Variable included in the model as the health service utilization variable.
‡‡ High utilizer indicates >4 different doctors seen in the last year or >3 years followed in clinic or >4 doctors/nurses seen in clinic in the last year or >1 hospital admission in the last year or >7 visits to clinic in the last year or >7 visits to any doctor in the last year.
§§ Mean waiting time ± SD = 40.1 ± 28.1 min; mean visit length ± SD = 27.8 ± 17.1 min.
‖ All the obstetrics/gynecology interns were female.

Table 2. Multivariate Ordinal Logistic Regression for Satisfaction Score

Variable	Cumulative Odds Ratio (95% Confidence Interval)	*p* Value
Patient		
Gender		
Male	1.22 (0.79, 1.90)	.372
Female	1.00	
Age, years	1.01 (1.00, 1.03)	.151
Socioeconomic status		
Low*	1.00	
Not low	1.77 (1.13, 2.76)	.012
Health status		
Good or excellent	2.39 (1.32, 4.33)	.004
Fair or poor	1.00	
Complexity		
Not complex	1.00	
Complex†	0.90 (0.57, 1.41)	.644
Number of reasons for visiting (1, 2, 3, 4, 5)	0.67 (0.52, 0.86)	.002
Health system		
Health service utilization		
High utilizers‡	2.06 (1.33, 3.21)	.001
Not high utilizers	1.00	
Waiting time (in minutes)	0.98 (0.97, 0.99)	.001
Visit length (in minutes)	1.02 (1.01, 1.03)	<.001
Resident		
Training type		
Primary care	1.74 (1.14, 2.67)	.011
Categorical	1.00	
Year of training		
3 or 4	1.60 (1.04, 2.45)	.031
1 or 2	1.00	
Gender		
Male	0.99 (0.64, 1.53)	.959
Female	1.00	
Intercepts (Ordinal Satisfaction Score)	Coefficients	
5	−2.45	
5 or 4	1.81	
5, 4, or 3	3.68	
5, 4, 3, or 2	6.96	

**Low socioeconomic status indicates income <$10,000/year, education <high school graduate, and not employed.*

†*Complex indicates >3 medical problems or >3 medications per day.*

‡*High utilizer indicates >4 different doctors seen in the last year or >3 years followed in clinic or >4 doctors/nurses seen in clinic in the last year or >1 hospital admission in the last year or >7 visits to clinic in the last year or >7 visits to any doctor in the last year.*

ranking of residents according to their satisfaction ratings. When we compared the ranking of residents with and without adjusting for these factors, we found that among the residents with six or more ratings, only 27% of those in the lowest quartile would have been correctly classified by the unadjusted ratings. These findings corroborate those of two other studies, one in a teaching setting[6] and the other in a community-based setting,[11] that demonstrated the importance of these factors if one uses satisfaction ratings to rank or profile physicians. This type of analysis, however, should be interpreted cautiously. Although it illustrates the importance of adjusting for these factors, it should not be used to rank or profile physicians (regardless of the setting) on the basis of only 9.8 surveys per physician. The ABIM recommends that 20 to 35 ratings per resident be obtained in order to obtain reproducible results[5]; therefore, our analysis is more useful for illustrative than for practical purposes.

Several limitations should be kept in mind when interpreting these data. First, the data were collected on one group of residents in one urban teaching hospital clinic; they may not be generalizable to similar teaching settings and are certainly not generalizable to community-based teaching settings. Second, an inherent selection bias is involved with surveying scheduled patients who agree to complete a survey, especially when considering the people who were excluded (e.g., those who refused, were too ill, or were missed because the clinic was too busy). Third, we treated each patient rating as an independent observation. An analysis that nests ratings within residents would provide other information; however, given the ordinal nature of the dependent variable and the limited number of patients per resident, this analysis was not feasible. A fourth limitation relates to the outcome variable. The PSQ focused on the interpersonal aspects of care; as a result, the satisfaction score more closely reflects patients' assessments of the interpersonal component of their care than any other. Several authors have shown that patients distinguish among different dimensions of care and rate them separately, even if all contribute to their overall judgments of care.[8,10,15–17] Therefore, satisfaction with interpersonal skills is only one dimension of care, while satisfaction with technical skill, accessibility, etc., are other components, which we did not address directly in this study.

Nonetheless, the results do suggest that residents with primary care training receive higher satisfaction ratings than categorical residents. Future research is needed to determine if these findings can be replicated in other teaching settings, both university- and community-based.

Finally, it would be important to know if this relationship persists after training is completed; this suggests the need for more community-based studies of patient satisfaction with practicing physicians.

REFERENCES

1. Epstein A. Sounding board: performance reports on quality—prototypes, problems, and prospects. N Engl J Med. 1995;333:57–61.
2. Doyle E. Can patient satisfaction surveys help diagnose (and improve) your practice? ACP Observer. 1996;16(2):1,14,17.

3. Cope DW, Linn LS, Leake BD, Barrett PA. Modification of residents' behavior by preceptor feedback of patient satisfaction. J Gen Intern Med. 1986;1:394–8.
4. Linn LS, Cope DW, Leake B. The effect of gender and training of residents on satisfaction ratings by patients. J Med Educ. 1984; 59:964–6.
5. Webster GD. Final report on the Patient Satisfaction Questionnaire Project, Executive Summary. Philadelphia, Pa: American Board of Internal Medicine; 1989.
6. Tamblyn R, Benaroya S, Snell L, McLeod P, Schnarch B, Abrahamowicz M. The feasibility and value of using patient satisfaction ratings to evaluate internal medicine residents. J Gen Intern Med. 1994;9:146–52.
7. Sisk JE, Gorman SA, Reisinger AL, Glied SA, DuMouchel WH, Hynes MM. Evaluation of Medicaid managed care: satisfaction, access, and use. JAMA. 1996;276:50–5.
8. Linder-Pelz S, Struening EL. The multidimensionality of patient satisfaction with a clinic visit. J Community Health. 1985;10:42–54.
9. Comstock LM, Hooper EM, Goodwin JM, Goodwin JS. Physician behaviors that correlate with patient satisfaction. J Med Educ. 1982;57:105–12.
10. Hsieh MO, Kagle JD. Understanding patient satisfaction and dissatisfaction with health care. Health Soc Work. 1991;16:281–90.
11. Greenfield S, Sullivan LM, Dukes KA, Tripp TJ, Kaplan SH. Unadjusted patient satisfaction scores used in physician profiling result in spurious ranking. J Gen Intern Med. 1996;11(suppl 1):72. Abstract.
12. Kravitz RL, Cope DW, Bhrany V, Leake B. Internal medicine patients' expectations for care during office visits. J Gen Intern Med. 1994;9:75–81.
13. Agresti A. Analysis of Ordinal Categorical Data. New York, NY: John Wiley & Sons; 1984:112–5.
14. Greenland S. Alternative models for ordinal logistic regression. Stat Med. 1994;13:1665–78.
15. Rubin HR, Gandek B, Rogers WH, Kosinski M, McHorney CA, Ware JE. Patients' ratings of outpatient visits in different practice settings: results from the Medical Outcomes Study. JAMA. 1993; 270:835–40.
16. Rubin HR, Wu AW. Patient satisfaction: its importance and how to measure it. In: Gitnick G, Rothenberg F, Weiner JL, eds. The Business of Medicine. New York, NY: Elsevier; 1991:397–409.
17. Hall JA, Dornan MC. What patients like about their medical care and how often they are asked: a meta-analysis of the satisfaction literature. Soc Sci Med. 1988;27:935–9.

APPENDIX A
*Patient Satisfaction Questionnaire**

How Was the Doctor You just Saw at:	Poor	Fair	Good	Very Good	Excellent
1. Greeting you warmly and being friendly.					
2. Telling you everything you need to know.					
3. Not "talking down" to you or treating you like a child.					
4. Letting you talk without interrupting, and listening carefully.					
5. Showing interest in you as a person, without acting bored or ignoring what you say.					
6. Telling you while examining you what will happen next.					
7. Telling you while examining you what he/she finds.					
8. Asking your opinion and involving you in the decisions.					
9. Encouraging you to ask questions, and answering them completely.					
10. Letting you know what to expect in regard to your health.					
11. Using words you can understand when explaining your problems and treatment.					

**Cronbach's* $\alpha = 0.98$.