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Identifying Gaps in Resident Knowledge of Patient Satisfaction

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Complete List of Authors:	Stewart, Diana; Baylor College of Medicine, Internal Medicine and Pediatrics; Michael E. DeBakey VA Medical Center Dang, B.N.; Michael E. Debakey VA Medical Center; Baylor College of Medicine, Section of Health Services Research Wells Trautner, Barbara Cai, Cecilia ; Baylor College of Medicine Torres, Sergio; Baylor College of Medicine Turner, Teri; Baylor College of Medicine
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Title: Identifying Gaps in Resident Knowledge of Patient Satisfaction

Authors: Diana E. Stewart, MD, MBA[1,3,4], Bich N. Dang, MD[1,2,3], Barbara Trautner, MD, Ph. D[1,2,3], Cecilia Cai[1], Sergio Torres, MD[1], Terri Turner, MD, MPH, M. Ed[4,5]

Author Affiliations: [1]Section of General Internal Medicine, and [2]Section of Health Services Research, Department of Medicine, Baylor College of Medicine, Houston, Texas, USA.

[3]Michael E. DeBakey Veteran Affairs Medical Center, Houston, Texas, USA.

[4]Department of Pediatrics, Baylor College of Medicine, Houston, Texas, USA

[5]Center for Research, Innovation, and Scholarship in Medical Education, Texas Children's Hospital, Houston, Texas, USA.

Author Roles: Diana Stewart, MD, MBA is an assistant professor and hospitalist, Department of Pediatrics-Hospital Medicine and Department of Internal Medicine, Baylor College of Medicine in Houston, TX. **Bich N. Dang, MD** is an assistant professor in the Department of Medicine-Section of Infectious Disease, Baylor College of Medicine and a clinical investigator with the Center for Innovations in Quality, Effectiveness and Safety at the Michael E. DeBakey VA Medical Center in Houston, TX. **Barbara W. Trautner, MD, PhD** is an infectious diseases clinician-investigator focused on prevention of healthcare associated infections and antibiotic stewardship with the Center for Innovations in Quality, Effectiveness and Safety at the Michael E. DeBakey VA Medical Center and Department of Medicine, Baylor College of Medicine in Houston, TX. **Cecilia Cai** is a medical student at Baylor College of Medicine, Houston, Texas. **Sergio Torres, MD** is an assistant professor and hospitalist, Department of Internal Medicine, Baylor College of Medicine, Houston, TX. **Teri Turner, MD, MPH, M. Ed** is an associate professor, Department of Pediatrics at Baylor College of Medicine, and director, Center for Research, Innovation, and Scholarship in Medical Education, Texas Children's Hospital, Houston, Texas.

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Corresponding Author Information:

Diana Stewart, MD, MBA

Assistant Professor

1102 Bates Street, FC 1860

Houston, TX 77030

Office Phone: 832-824-5447

Fax: 832-825-5424

E-mail: anukwuem@bcm.edu

Abstract

Objectives

Patient satisfaction healthcare quality and outcomes. Residents play an important role in patient satisfaction at academic institutions. This study aims to assess residents' patient satisfaction knowledge and determine which learning experiences contributed to their knowledge.

Settings

This study was conducted at a large urban, tertiary care academic medical center in the United States.

Participants

All residents from internal medicine (n= 185) and pediatrics (n=156) were asked to participate.

Design

Residents completed a survey from April 2013 to December 2013. The survey assessed: (1) knowledge of factors that impact satisfaction and (2) learning experiences that may have contributed to residents' understanding of the drivers of patient satisfaction (e.g. experiential (personal or clinical) or didactics). Trainees identified the importance of factors in determining patient satisfaction on a 5-point Likert scale; answers were compiled into a knowledge score. The score was correlated with prior personal/clinical experience and didactics.

Results

Of 341 residents, 247 (72%) completed the survey. No difference was found in knowledge among training levels or residency programs. More than 50% incorrectly thought board certification, patient education, patient income, and physician age impacted satisfaction. Personal experience, through hospitalization of a relative or friend, was correlated with higher knowledge (67% vs. 71%, p=.03). Ninety-nine percent (n=238) stated peer observation, and all stated faculty feedback impacted their patient satisfaction knowledge. Seventy-seven percent (n=185) had attended didactics on satisfaction, but attendance did not correlate with higher scores.

Conclusions

Care provided by residents impacts patient satisfaction and hospital quality metrics. Our study showed trainees have a few gaps in their patient satisfaction knowledge and attending past educational sessions on patient satisfaction did not correlate with higher knowledge scores. Our data suggests that academic centers should leverage residents' personal experiences, their observations of peers, and faculty feedback to enhance patient satisfaction knowledge.

Strengths and Limitations of this Study

- Residents serve a dual role as providers and learners in academic settings and can greatly influence hospital quality metrics, specifically patient satisfaction. However, few studies have assessed resident knowledge in patient satisfaction and attempted to determine which types of learning experiences correlate with residents' knowledge.

- Recognizing resident knowledge gaps in patient satisfaction allows hospital administrators and academic institutions to develop targeted, practical, and sustainable interventions to augment trainee knowledge and improve the patient care experience and reimbursement.

- Residents' patient satisfaction knowledge score was impacted by experiential learning specifically hospitalization of a close contact, peer and faculty observation, and faculty evaluations.

- Even though a large training program with multiple educational clinical sites was analyzed, the study was performed at a single academic center.

- Residents' knowledge scores were not correlated with resident clinical performance, including provider satisfaction scores or patient evaluation of resident, due to the anonymity of the survey.

Background

Patient satisfaction is an important component of patient-centered care; it is linked to healthcare quality and associated with improved compliance and adherence.[1-5] Patient satisfaction and patient experience has received even greater emphasis in health care institutions in the United States (US) since the Affordable Care Act (a comprehensive healthcare reform act in the United States enacted in 2010), as a hospital's reimbursement is impacted by the value of care it provides rather than traditional fee for service. The "value" is calculated by the hospital's value-based total performance score, which includes several domains, one of which is patient satisfaction.[6,7] Although value-based care purchasing applies to only the Center for Medicare and Medicaid Services (CMS), other private payers have added satisfaction scores to their pay-for-performance measures.[6] For CMS, 25% of value-based purchasing will be based on the results of Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), an instrument to assess patient satisfaction.[8-10] With such an emphasis on payment and the link to patient satisfaction and improved patient outcomes, it is incumbent upon all caregivers, particularly physicians in training, to understand what contributes to patients being satisfied with their care.

Many factors, such as responsiveness, communication, and interpersonal manner of caregivers, are positive determinants, or drivers, of patient satisfaction; however, whether trainees are aware of these factors remains unclear.[2] Functioning as both learners and providers, residents are important to the framework, quality, and outcomes of the health care delivered in an academic setting, specifically patient satisfaction.[11-12] Even though residents may have been taught some components of patient satisfaction in medical school; teaching and learning are not interchangeable.[13-16] Prior studies have assessed interventions targeting residents to improve patient satisfaction, such as generalized education and incentives, but the literature regarding residents' current knowledge of patient satisfaction is sparse.[10] To develop practical, cost-effective, sustainable interventions that benefit the trainee as well as the institution, understanding the gaps in residents' knowledge regarding drivers or positive determinants of patient satisfaction is critical and a necessary first step to changing their practice. The primary study aim was to assess residents' knowledge of factors strongly correlated with patient satisfaction, termed "drivers." A secondary aim was to determine which types of learning experiences (didactic, personal, or clinical experiences) most strongly correlate with residents' knowledge.

Methods

Setting and Participants

This study was conducted at a large urban, tertiary care academic medical center in Houston, Texas, USA; one of the most diverse cities in the US. The medical center is the largest complex in the US with 56 member institutions and over 9,000 hospital beds. All residents from internal medicine (n= 185) and pediatrics (n=156) were asked to participate. This was a convenience sample of primary care residents, in which a large percentage of care involves communicating and interacting directly with patients daily. Residents from the internal medicine and pediatric programs train about 40% of the residents at our institutions and it was felt that if differences could be detected the larger sample size afforded by these programs would be beneficial in this assessment.

Residents do not train in one primary university-affiliated training hospital. Rather, these training programs offer a breadth of exposure to outpatient and inpatient care across private, Veterans Affairs, and county hospitals, and patients from various socioeconomic and cultural backgrounds.

Participant Exposure to Patient Satisfaction Metrics

Supervising physicians regularly receive data on the various institution's satisfaction metrics or scores. To collect this patient satisfaction data, the affiliates partner with a third-party vendor, a private organization whose questionnaires are used by over 7000 facilities in the US, to survey patients on their experience in receiving health care at the institution. These surveys are done via phone, mail, or email and meet the requirements of CMS that utilizes the Consumer Assessment of Healthcare Providers and Systems (CAHPS) (discussed further in methods). Partnering with the third-party vendor allows the institutions to make internal and external comparisons regarding their satisfaction metrics. [10,17] At each institution, this information may be disseminated to residents during patient rounds, morning reports, or noon conferences. Some of the affiliated training institutions have patient experience initiatives that residents will be exposed to when they rotate through the hospital; however, this will vary. For instance, residents who rotate on the pediatric hospital medicine service at the pediatric affiliate hospital participate in family centered-rounds, an interprofessional, patient-centered rounding practice that involves patients, nurses, and providers.

Residents get feedback on their clinical performance, but may infrequently receive the data on the hospital unit or clinic's patient satisfaction scores due to their rotation schedules. Residents are on each inpatient or outpatient rotation for only four weeks and the satisfaction data is usually reviewed monthly or quarterly. Medicine-pediatric and pediatric residents do have a patient and nursing evaluation done of their performance, but these surveys are usually reviewed in a summative manner, twice annually to promote open and honest feedback from the support staff.

Moreover, patient satisfaction exposure at the clinical site is variable in degree and frequency for each resident and therefore difficult to quantify given the differences in each training site and program. It is also unclear if supervising physicians pervasively acknowledge and disseminate the data to residents.

Survey Instrument

A 31-item survey was developed through review of patient satisfaction literature, prior surveys, and published work.[2,19-24] The questionnaire focused on three concepts: (1) knowledge of factors that influence patient satisfaction, (2) personal and clinical experiences contributing to a resident's satisfaction knowledge, and (3) prior educational sessions (didactics) received related to patient satisfaction. The questionnaire was developed through an iterative process that incorporated a psychometrician, health services researchers, and residency program faculty. Pilot testing using a think-aloud process was conducted with a group of internal medicine residents who were not part of the study. Internal assessment and feedback from these individuals improved the clarity of the items and general format.

Knowledge of Factors Impacting Patient Satisfaction. Questions 1-20 assessed knowledge of the factors related to patient satisfaction, using a 5-point Likert-type scale (1 = not at all important to 5 = extremely important) (See Appendix 1 for Survey Instrument). For this study, patient satisfaction knowledge will refer to knowledge of the drivers of patient satisfaction assessed by the survey instrument. Crow et. Al reviewed 139 international articles and 127 data sets and concluded that determinants of patient satisfaction can be broken down into two groups: characteristics of the health care delivery system and patient.[2] For many US institutions, patient experience is a surrogate marker of patient safety satisfaction, therefore the current validated surveys that assesses patient satisfaction were reviewed for themes as well and author's prior work. [9,19,22-24] CMS uses the Consumer Assessment of Healthcare

Providers and Systems (CAHPS) surveys to assess patient satisfaction in different settings; by 2017, 25% of value-based purchasing will be based on the results of HCAHPS.[9,19] These surveys are developed and maintained by the U.S. Agency for Healthcare Research and Quality (AHRQ) and have been validated. HCAP surveys patients based on 6 areas: communication with physicians, communication with nurses, communication about medications, quality of nursing services, adequacy of planning for discharge, and pain management.[8,9,19]

The Hospital CAHPS (HCAHPS) survey, the Clinician and Group CAHPS (CG-CAHPS) for outpatient use, the Patient Satisfaction Questionnaire (PSQ) from Rand Health, all well-known validated instruments that assess patient satisfaction via patient experience, were reviewed for important determinants of patient satisfaction.[19-20] Using these surveys and published literature, 5 domains of patient satisfaction were identified and assessed in the knowledge portion of the survey (Table 1).[2,19-24] To minimize bias and limit survey length, the final survey included 11 variables consistently related to patient satisfaction and 9 non-drivers that are commonly presumed to affect satisfaction but have been shown to not be associated.[2,19-24] Inclusion of commonly mistaken non-drivers in the survey were done because the authors thought it was important to also know where the current misconceptions are regarding patient satisfaction. An answer was correct if the resident strongly identified whether the item was related to patient satisfaction (answer of 4 or 5 for true variables/drivers and an answer of 1 or 2 for the non-drivers/false variables). Other responses were deemed incorrect (answer of 1, 2 or 3 for true variables/drivers and an answer of 3, 4 or 5 for the non-drivers/false variables). Selection of "3" for either category was regarded as a neutral response. Scoring was dichotomized to either correct or incorrect and was reported as a proportion of 100 percent (e.g. 10 correct answers = 50%).

Experiential Learning: Personal and Clinical Experiences. Questions 21-27 explored personal and clinical experiences that may impact knowledge of patient satisfaction. The personal experiences focused on personal or relative/friend's hospitalization. Clinical experiences included clinical observations of faculty and peers with patients as well as feedback from evaluations of faculty, nurses, or patients. All these experiences were assessed independently. This portion was assessed using a 4-point Likert scale (1 = no impact to 4 = large impact; 0= not applicable). The respondents were dichotomized into two groups: those who had the specific experience (response of 1 to 4) and those who did not (response of not applicable). Each experience item was analyzed as a continuous variable (degree of impact) and a categorical variable (dichotomized into those who had the specific experience and those who did not). For this analysis, the degree of impact and the dichotomized responses were correlated with the knowledge score.

Educational Sessions (Structured Didactics) on Patient Satisfaction. Questions 28-30 explored how often residents had received prior didactics on patient satisfaction. Respondents were asked to approximate how many times they had received an education session on patient satisfaction in medical school or residency. The last question of this section assessed how these didactics were given (e.g. lecture, workshops, or hospital orientation). Responses to this section were correlated with the knowledge score.

The final question asked residents to respond to the statement, "I am confident that my patients are satisfied with the care I provide." Responses were based on a 5-point Likert scale (1 = strongly disagree to 5 = agree). Demographic data also were collected on participants.

Survey distribution

A member of the research team administered an anonymous survey at resident teaching conferences from April 2013 to December 2013. Each completed survey was assigned a unique study number. Respondents were monitored to prevent duplicate submissions. Participation in the survey was voluntary and no penalty was given for not participating; incentives were not given.

Statistical Analysis

Descriptive statistics were computed on demographic data. Frequencies and mean scores (including trainee year and program type) were compared using ANOVA. Point-biserial correlation was used to assess the correlation between the knowledge score and each type of learning experience (didactic or experiential (personal or clinical experiences with hospitalization)). Frequencies and means of the knowledge score stratified by type of learning experiences were also compared using ANOVA. Spearman's rho was used to assess the correlation between knowledge score and the degree of impact of the experiences. Data were analyzed using IBM SPSS Statistics version 23.

The study was approved by the Institutional Review Board and the Research and Development Committee.

Results

112 of 156 pediatric residents (72%) and 135 of 185 medicine residents (73%) completed the survey. We analyzed 239 surveys, excluding 8 for incomplete data. Internal medicine-pediatrics residents were grouped with the medicine residents. See Table 2 for demographics.

Knowledge of Factors Impacting Patient Satisfaction. Knowledge scores are shown in Table 3. The mean score was 70%. More upper-level residents incorrectly rated physician rank in medical school as a contributor to satisfaction (p = 0.02); otherwise, there were no differences in scores among trainee levels. Additionally, no difference was noted in knowledge scores when comparing pediatrics, internal medicine, or med-peds (the mean score ranged from 68-70%). In general, recognition of the correct drivers of patient satisfaction was high (80%), except for recognizing that patients' health status and age and the patients' rating of the nurses' discussion about treatment are important drivers (Table 3).[2] More than half of all residents incorrectly reported the following were drivers of patient satisfaction: physician age, patient income, board certification, and patient level of education.

Experiential learning: Personal and clinical experiences. 0f 239 respondents, 87 (36%) had been hospitalized, and 187 (78%) had experienced hospitalization with a family member or friend. Hospitalization of a family member or friend was significantly correlated with higher knowledge of patient satisfaction drivers (p=.03). A significant relationship was not seen when assessing a trainee's own hospitalization.

The majority stated that observing peers (n = 238), observing supervisors (n = 239), and receiving feedback from faculty evaluations (n = 233), influenced their understanding of what affects patient satisfaction (99, 100, and 97%, respectively); these experiences did not correlate significantly with a higher knowledge score when dichotomized to those who had the experience compared to those who did not. When examining the level of impact (1 to 4) of these observations, higher impact ratings for

faculty evaluations was the only factor that correlated with significantly higher knowledge scores, but the correlation was weak ($p<.05$, correlation coefficient .13; spearman rho correlation). Feedback from nurses and patients via evaluations did not significantly correlate with higher knowledge scores. Of note, only 55% (n=132) and 56% (n=134) of trainees reported feedback from nurses and patients, respectively, impacted their patient satisfaction knowledge.

Structured Didactics on Patient Satisfaction. Of 239 respondents, 185 (77%) had attended an educational session on patient satisfaction. No significant difference was found in the knowledge score of those who had attended a session compared to those who had not. Almost half (47.5%) did not attend an educational session during residency, whereas only 67% had attended a session during medical school (n=161). Nonetheless, 88% (n= 211) of respondents agreed or strongly agreed that their patients are satisfied with their care. There was no significant difference in knowledge score in residents who rated a higher level of confidence.

Discussion

Donabedian stated that the ultimate validation of a quality of care is when an individual member of society achieves health and satisfaction.[13] With the move towards patient-centered care, patient satisfaction and experience are core outcomes for hospitals today.[6] Residents or physicians in training are important contributors to patients' experiences in academic institutions and are key determinants of patient satisfaction. We conducted a study to gauge residents' knowledge of drivers of patient satisfaction. We found the mean knowledge score for all resident levels to be 70%. Interestingly, the score did not increase with training level. Residents had difficulty recognizing that personal and demographic features of patients can affect their satisfaction. Specifically, they understood that interpersonal and communication skills are important (except for discussion about treatment by nurses), but surprisingly, they thought patients cared about board scores and board certification status.

Identifying the most common and universally accepted drivers of patient satisfaction can provide a foundation for curricula to address trainee's knowledge gaps in these areas. Knowing what residents currently know is an important first step to changing their practices.[13-16] Based on these results, a suggested starting point may be curricula geared towards augmenting nurse inclusion in treatment plans given this was an area of deficiency. Regarding patient features, patients with more comorbidities may have lower satisfaction scores; however how satisfaction is affected in acute illness is undetermined.[2] These patients have specific preferences based on their health status. Learning how to affectively decipher these preferences prior to making treatment plans is a potential focus area for future curricula.

We also investigated what factors contribute to residents' patient satisfaction knowledge to guide future educational initiatives. Most residents have not been hospitalized, which is not surprising given the average age of trainees in this study (84% were younger than 30 years). Hospitalization of a family member or friend, however, resulted in a significantly higher knowledge of patient satisfaction compared to those who did not have this experience. Even though most residents had experienced the patient's perspective on hospitalization via a relative, friend, or personal hospitalization, these experiences may not be a practical approach to guide educational initiatives for trainees who did not have these experiences. A significant relationship was not seen when assessing a trainee's own hospitalization likely given the low number of individuals who had previously been hospitalized. On the other hand, peer and faculty observations are major ways residents are taught about patient satisfaction. Faculty role modeling is known to influence resident education, specifically shaping trainees' values, attitudes, and ethics; the modeling provided by faculty behavior is known as the hidden

curriculum.[25] Peer observation and feedback have been shown to be useful for medical learners as well, especially in the development of professionalism, teamwork, and interprofessional skills.[26-29] These topics may provide a potential area of focus to augment learning on satisfaction.

We also looked at structured didactics that aim to teach residents about patient satisfaction. Although 185 of 239 respondents (77%) had attended an educational session on patient satisfaction, most of these sessions were delivered in medical school, which may explain the lack of increase in knowledge with trainee years. Teaching and learning are not interchangeable and there is a complex interplay of many factors, such as attention, cognitive load, rehearsal practice, that result in knowledge being retained in long term memory. Knowledge that is not used, rehearsed or revisited is often forgotten. These factors may explain that lack of improvement in knowledge following a previous lecture on satisfaction. [13-15] The details of these didactic sessions were not addressed by our survey, therefore precluding the ability to make any comment on the content. A recent single-site survey found that bundled interventions that included didactics, real-time feedback on patient satisfaction scores, and monthly recognition of trainees with high scores resulted in improvement in patient satisfaction scores.[18] Moreover, didactics in patient satisfaction alone may not be sufficient to augment patient satisfaction knowledge and change physician behavior.

Limitations

Even though, we studied three large training programs at the same academic center in which the trainees were exposed to a breadth of clinical training sites; the study was performed at a single academic center. However, the results can be applicable to any residency training program given patient satisfaction is a metric common to all institutions and drivers of patient satisfaction are applicable to all specialties. This information can serve as a guide to the types of educational interventions to target for trainees. Additionally, the survey tool, although developed through an iterative process and pilot tested, has not previously been validated. The survey was however grounded in the literature and derived from validated survey measures of patient satisfaction developed for performance metrics purposes. Several questions asked the residents to recall previous learning experiences, either didactic or experiential, and therefore the results may also be limited by recall bias. Another limitation is the lack of correlation with the resident's clinical performance. The anonymous nature of the survey prevented us from correlating knowledge scores, experiences, and confidence of a resident with actual provider satisfaction scores or evaluations from patients, which would have enabled us to correlate knowledge with behavior. However, as the first step in understanding the trainees' experiences, the benefit of anonymity and honesty of reporting outweighed the ability to correlate knowledge with actual clinical behavior.

Conclusion

Residents are important providers of medical care in academic institutions; their daily interactions with patients impact patient satisfaction and hospital quality metrics and reimbursement. We demonstrated some gaps in knowledge concerning drivers of patient satisfaction that did not vary by training year. Residents' awareness of patient satisfaction was impacted by experiential learning (clinical and personal), specifically hospitalization of a close contact, peer and faculty observation, and faculty evaluations. Hospital administrators and educators should recognize didactics alone may not be sufficient to augment trainee patient satisfaction knowledge. More consideration may need to be given to the effect of peer and faculty role modeling when developing future interventions to improve satisfaction for patients cared for by resident providers.

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Table 1. Domains of Patient Satisfaction and Linked Survey Question

Driver Domains	Abbreviated Survey Question	Percentage Correct (95% CI)
Accessibility, Convenience, and Responsiveness	Responsiveness of ancillary staff	94.1% (90.592% to 96.627%)
Communication	Physician explanations	96.7% (94.853% to 98.976%)
	Nurse willingness to listen	96.2% (93.203% to 98.148%)
	Nurse explanations	80.3% (74.931% to 85.007%)
	Physician listening	97.1% (94.293% to 98.710%)
	Discussion about treatment by nurses	67.4% (61.224% to 73.086%)
Interpersonal Manner of Caregiver	Courtesy and respect from nurses	92.9% (89.078% to 95.661%)
	Courtesy and respect from physicians	96.2% (93.203% to 98.148%)
Personal Factors of Patient	Poor health status of patient	55.6% (49.300% to 61.861%)
	Age of patient	15.1% (10.942% to 20.026%)
Technical Quality and Care from Doctors	Thoroughness and Competence of physician	87.4% (82.783% to 91.210%)

Table 2. Demographics of Participants

Post-graduate year (PGY)	**N (%)**
PGY-1	118 (49.4)
PGY-2	62 (25.9)
PGY-3 and 4	59 (24.7)
Residency Program	**N (%)**
Internal Medicine	118 (49.4)
Pediatrics	96 (40.2)
Medicine/Pediatrics	14 (5.9)
Other [a]	11 (4.6)
Age [b]	**N (%)**
≤ 29	201 (84.1)
> 29	37 (15.5)
Gender [b]	**N (%)**
Male	95 (39.7)
Female	143 (59.8)
Ethnicity [c]	**N (%)**
Hispanic	17 (7)
Black	11 (4.6)
White	118 (49.4)
Asian	88 (37)
Other	5 (2)
Additional training [b]	**N (%)**
None	206 (86.6)
MPH	8 (3.4)
MBA	2 (0.8)
Other	22 (9.2)

[a]This category includes anesthesia, family medicine, surgery, and emergency medicine.
[b]One respondent did not answer.
[c]Two respondents did not answer this question and 2 respondents selected multiple categories.

Table 3. Results of Patient Satisfaction Knowledge Survey

Driver or Non-Driver	Abbreviated Survey Question	Percentage Correct (95% CI)
Driver	Poor health status of patient	55.6% (49.300% to 61.861%)
	Physician explanations	96.7% (94.853% to 98.976%)
	Responsiveness of ancillary staff	94.1% (90.592% to 96.627%)
	Thoroughness and Competence of physician	87.4% (82.783% to 91.210%)
	Nurse willingness to listen	96.2% (93.203% to 98.148%)
	Nurse explanations	80.3% (74.931% to 85.007%)
	Courtesy and respect from nurses	92.9% (89.078% to 95.661%)
	Courtesy and respect from physicians	96.2% (93.203% to 98.148%)
	Physician listening	97.1% (94.293% to 98.710%)
	Age of patient	15.1% (10.942% to 20.026%)
	Discussion about treatment by nurses	67.4% (61.224% to 73.086%)
Non-driver	Physician USMLE score	92.9% (89.078% to 95.661%)
	Income of patient	48.5% (42.236% to 54.871%)
	Physician age	29.3% (23.780% to 35.296%)
	Medical school attended	74.1% (68.220% to 79.317%)
	Board certification status of physician	44.8% (38.547% to 51.119%)
	Education level of patient	20.9% (16.117% to 26.425%)
	Physician rank in medical school	90.4% (86.129% to 93.651%)
	Gender of patient	64.4% (58.208% to 70.315%)
	Gender of physician	52.3% (45.960% to 58.587%)

Appendix 1: Survey Instrument

We are conducting a research study to measure residents' awareness of factors that can influence patient satisfaction. Residents, like you, are important providers of medical care in academic institutions, and as such have an impact on patient satisfaction. Given the important role you play in patient care, we want to learn what you believe affects the satisfaction of your patients with the care you provide. For pediatric patients, the survey refers to parent satisfaction only.

Part I: Tell us about you.

1. What year are you in residency?

- ☐ PGY-1
- ☐ PGY-2
- ☐ PGY-3
- ☐ PGY-4
- ☐ Other (specify) _____

2. Type of residency program

- ☐ Internal Medicine
- ☐ Pediatrics
- ☐ Internal Medicine-Pediatrics
- ☐ Preliminary Program
- ☐ Transitional Program
- ☐ Surgery
- ☐ Obstetrics and Gynecology
- ☐ Other (specify) _____

3. What is your age range?

- ☐ Under 25
- ☐ 25-29
- ☐ 30-34
- ☐ 35 and over

4. What gender are you?

- ☐ Male
- ☐ Female

5. Are you of Hispanic or Latino origin?

- ☐ Yes
- ☐ No

6. What is your race? (Mark all that apply)

- ☐ Black or African American
- ☐ White
- ☐ Asian
- ☐ Other (specify) _____

7. Do you have additional graduate degrees?

- ☐ No
- ☐ MPH
- ☐ MBA
- ☐ Other (specify) _____

Part II: Understanding Drivers of Patient Satisfaction

Think about the factors listed below that may influence the satisfaction of patients with the care you provide. How important or unimportant do you consider each of the following influences on the satisfaction of your patients with your care?

1. Ranking of medical school that physician attended	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
2. Poor health status of patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
3. Physician explaining tests, treatments, diagnosis	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
4. Board certification status of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
5. Responsiveness of ancillary staff to patient's needs	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
6. Level of education of patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
7. Thoroughness and competence of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
8. Nurses willingness to listen to patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
9. Physician rank in medical school	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
10. Explanations provided by nurses	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
11. Courtesy and respect from nurses	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
12. USMLE score of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
13. Income level of patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
14. Age of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
15. Courtesy and respect from physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
16. Listening skills of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
17. Age of patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
18. Gender of patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
19. Gender of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
20. Discussions about treatment provided by nurse	Not at all Important	Slightly Important	Important	Very Important	Extremely Important

Part III: Personal Experiences

Which of the following experiences have added to your understanding of what affects patients' satisfaction with the care you provide? If you have not personally had any of the experiences below, please select N/A (not applicable).

21. Your own hospitalization

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

22. Hospitalization of a family member or friend

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

23. Observation of your peer's interaction with patients (i.e. other interns or residents)

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

24. Observation of supervisor's interactions with patients (i.e. attending)

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

25. Feedback from faculty evaluations

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

26. Feedback from nursing evaluations

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

27. Feedback from patient evaluations

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

Part IV: Education about Patient Satisfaction

28. How many times have you had an educational session that discussed patient satisfaction during medical school?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 or more

29. How many times have you had an educational session that discussed patient satisfaction during residency?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 or more

30. If you have attended an educational session on patient satisfaction, check all that apply.

☐ Resident lecture (i.e. noon conference, grand rounds, sub-specialty conference, etc.)
☐ Medical student lecture
☐ Workshop on patient safety at a local or national meeting
☐ Hospital orientation
☐ I have never attended a lecture on patient satisfaction

31. Please answer the following: I feel confident that my patients are satisfied with the care I provide.

☐ Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree

Thank you for taking the time to complete this survey. Your opinion matters!!

STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract **-Page 1**
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found **-Page 3**
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported **-Page 5**
Objectives	3	State specific objectives, including any prespecified hypotheses **-Page 5**
Methods		
Study design	4	Present key elements of study design early in the paper -**Page 5**
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection **-Page 5-6**
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up **-Page 5-7**
		(*b*) For matched studies, give matching criteria and number of exposed and unexposed **Page: Not applicable**
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable **-Page 5-7**
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group **-Page 6-7**

Bias	9	Describe any efforts to address potential sources of bias **-Page 5-7**
Study size	10	Explain how the study size was arrived at **-Page 5**
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why **Page: Not applicable**
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding **-Page 7**
		(*b*) Describe any methods used to examine subgroups and interactions -**Page 7**
		(*c*) Explain how missing data were addressed **Page: Not applicable**
		(*d*) If applicable, explain how loss to follow-up was addressed **Page: Not applicable**
		(*e*) Describe any sensitivity analyses **Page: Not applicable**
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed -**Page 7**
		(b) Give reasons for non-participation at each stage **Page: Not applicable**
		(c) Consider use of a flow diagram **Page: Not applicable**
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders -**Page 7**
		(b) Indicate number of participants with missing data for each variable of interest

		-**Page 7**
		(c) Summarise follow-up time (eg, average and total amount) **Page: Not applicable**
Outcome data	15*	Report numbers of outcome events or summary measures over time -**Page 7-8**
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included -**Page 7-8**
		(*b*) Report category boundaries when continuous variables were categorized -**Page 7-8**
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period **Page: Not applicable**
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses **Page: Not applicable**
Discussion		
Key results	18	Summarise key results with reference to study objectives -**Page 8-9**
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias -**Page 9**
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence -**Page 9**
Generalisability	21	Discuss the generalisability (external validity) of the study results -**Page 9**
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based -**Page 10**

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.

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Assessing Residents' Knowledge of Patient satisfaction: A Cross-sectional Study at a Large Academic Medical Center

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Title: Assessing Residents' Knowledge of Patient satisfaction: A Cross-sectional Study at a Large Academic Medical Center

Authors: Diana E. Stewart, MD, MBA[1,3,4], Bich N. Dang, MD[1,2,3], Barbara Trautner, MD, Ph. D[1,2,3], Cecilia Cai[1], Sergio Torres, MD[1], Teri Turner, MD, MPH, M. Ed[4,5]

Author Affiliations: [1]Section of General Internal Medicine, and [2]Section of Health Services Research, Department of Medicine, Baylor College of Medicine, Houston, Texas, USA.

[3]Michael E. DeBakey Veteran Affairs Medical Center, Houston, Texas, USA.

[4]Department of Pediatrics, Baylor College of Medicine, Houston, Texas, USA

[5]Center for Research, Innovation, and Scholarship in Medical Education, Texas Children's Hospital, Houston, Texas, USA.

Author Roles: Diana Stewart, MD, MBA is an assistant professor and hospitalist, Department of Pediatrics-Hospital Medicine and Department of Internal Medicine, Baylor College of Medicine in Houston, TX. **Bich N. Dang, MD** is an assistant professor in the Department of Medicine-Section of Infectious Disease, Baylor College of Medicine and a clinical investigator with the Center for Innovations in Quality, Effectiveness and Safety at the Michael E. DeBakey VA Medical Center in Houston, TX. **Barbara W. Trautner, MD, PhD** is an infectious diseases clinician-investigator focused on prevention of healthcare associated infections and antibiotic stewardship with the Center for Innovations in Quality, Effectiveness and Safety at the Michael E. DeBakey VA Medical Center and Department of Medicine, Baylor College of Medicine in Houston, TX. **Cecilia Cai** is a medical student at Baylor College of Medicine, Houston, Texas. **Sergio Torres, MD** is an assistant professor and hospitalist, Department of Internal Medicine, Baylor College of Medicine, Houston, TX. **Teri Turner, MD, MPH, M. Ed** is an associate professor, Department of Pediatrics at Baylor College of Medicine, and director, Center for Research, Innovation, and Scholarship in Medical Education, Texas Children's Hospital, Houston, Texas.

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Corresponding Author Information:

Diana Stewart, MD, MBA

Assistant Professor

1102 Bates Street, FC 1860

Houston, TX 77030

Office Phone: 832-824-5447

Fax: 832-825-5424

E-mail: anukwuem@bcm.edu

Abstract

Objectives

Patient satisfaction impacts healthcare quality and outcomes. Residents play an important role in patient satisfaction at academic institutions. This study aims to assess residents' patient satisfaction knowledge and determine which learning experiences contributed to their knowledge acquisition.

Settings

This study was conducted at a health science university in a large, urban, tertiary-care academic medical center in the United States.

Participants

All residents from internal medicine (n= 185) and pediatrics (n=156) were asked to participate.

Design

Residents completed a survey from April 2013 to December 2013 that assessed: (1) knowledge of factors that impact patient satisfaction and (2) learning experiences that may have contributed to their understanding of the drivers of patient satisfaction (e.g. experiential (personal or clinical) or didactics). Trainees identified the importance of factors in determining patient satisfaction on a 5-point Likert scale; answers were compiled into a knowledge score. The score was correlated with prior personal/clinical experience and didactics.

Results

Of the 341 residents, 247 (72%) completed the survey. No difference was found in knowledge among training levels or residency programs. More than 50% incorrectly thought physician board certification, patient's education, patient's income, and physician's age impacted satisfaction. Personal experience, through hospitalization of a relative or friend, was correlated with higher knowledge (67% vs. 71%, p=.03). Ninety-nine percent (n=238) stated peer observation, and all stated faculty feedback impacted their patient satisfaction knowledge. Seventy-seven percent (n=185) had attended didactics on satisfaction, but attendance did not correlate with higher scores.

Conclusions

Our study showed trainees have a few gaps in their patient satisfaction knowledge, and attending past educational sessions on patient satisfaction did not correlate with higher knowledge scores. Our data suggests that academic centers should leverage residents' personal experiences, their observations of peers, and faculty feedback to enhance patient satisfaction knowledge.

Strengths and Limitations of this Study

- Residents serve a dual role as providers and learners in academic settings and can greatly influence hospital quality metrics, specifically patient satisfaction. However, few studies have assessed residents' knowledge of what drives overall patient satisfaction or determined which types of learning experiences correlate with residents' acquisition of knowledge.

- Recognizing gaps in residents' knowledge of patient satisfaction allows hospital administrators and academic institutions to develop targeted, practical, and sustainable interventions to augment trainee knowledge and improve patient care, experience, and reimbursement.

- The study was performed at a large health sciences university with multiple educational clinical sites in a single academic medical center.

- Residents' knowledge scores were not correlated with clinical performance, including provider satisfaction scores or patient evaluation of residents, due to the anonymity of the survey.

Background

Patient satisfaction is an important component of patient-centered care; it is linked to healthcare quality and associated with improved compliance and adherence.[1-5] Patient satisfaction and patient experience have received increasing emphasis in healthcare institutions in the United States (US) since the Affordable Care Act (a comprehensive healthcare reform act in the United States enacted in 2010), as a hospital's reimbursement is impacted by the value of care it provides rather than traditional fee for service. The "value" is calculated by the hospital's value-based total performance score, which includes several domains, one of which is patient satisfaction.[6,7] Although value-based care purchasing applies to only the Center for Medicare and Medicaid Services (CMS), other private payers have added satisfaction scores to their pay-for-performance measures.[6] For CMS, 25% of value-based purchasing will be based on the results of Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), an instrument to assess patient satisfaction.[8-10] With such emphasis on payment and the link to patient satisfaction and improved patient outcomes, it is incumbent upon all caregivers, particularly physicians in training, to understand what contributes to patients being satisfied with their care.

Many factors, such as responsiveness, communication, and interpersonal manner of caregivers, are positive determinants, or drivers, of patient satisfaction; however, whether trainees are aware of these factors remains unclear.[2] Functioning as both learners and providers, residents are important to the framework, quality, and outcomes of the health care delivered in an academic setting, specifically patient satisfaction.[11-12] Residents may have been taught some components of patient satisfaction in medical school. However, teaching and learning are not synonymous; and, therefore, the information may not have been retained.[13-16] Previous studies have assessed interventions targeting residents to improve patient satisfaction, such as generalized education and incentives, but the literature regarding residents' current knowledge of patient satisfaction is sparse.[10] To develop practical, cost-effective, sustainable interventions that benefit the trainee as well as the institution, understanding the gaps in residents' knowledge regarding drivers or positive determinants of patient satisfaction is a critical and necessary first step to changing their practice. The primary study aim was to assess residents' knowledge of factors strongly correlated with patient satisfaction, termed *drivers*. A secondary aim was to determine which types of learning experiences (didactic, personal, or clinical) most strongly correlate with residents' knowledge.

Methods

Setting and Participants

This study was conducted at a large, urban health sciences university in a tertiary-care academic medical center in Houston, Texas, USA. All residents from internal medicine (n= 185) and pediatrics (n=156), which comprised approximately 40% of the resident staff in our training institutions, were asked to participate. Residents do not train in one primary university-affiliated training hospital; rather, they rotate through five affiliated institutions. They receive diverse exposure to outpatient and inpatient care across private, federal (Veterans Affairs) and county hospitals.

Participant Exposure to Patient Satisfaction Metrics

Patient satisfaction data at the affiliated institutions are collected by a CMS-approved third-party vendor, a private organization whose questionnaires are used by more than 7000 facilities in the US to

survey patients regarding their experiences in receiving health care at the institution. [10,17] Residents' exposure to these data vary between rotation and sites, and is difficult to quantify due to their rotation schedules. Residents rotate through different inpatient or outpatient sites every four weeks, while the patient experience data are usually reviewed monthly or quarterly.

Survey Instrument

A 31-item survey was developed through review of patient satisfaction literature, validated surveys and our prior work.[2,18-24] The questionnaire focused on three concepts: (1) knowledge of factors that influence patient satisfaction, (2) personal and clinical experiences that contribute to a resident's satisfaction knowledge, and (3) prior educational sessions (didactics) received related to patient satisfaction. Crow et. al reviewed 139 international articles and 127 data sets and concluded that determinants of patient satisfaction can be broken down into two groups: characteristics of the healthcare delivery system and patient experience.[2] Patient experience can be a surrogate marker of patient satisfaction; therefore, current validated surveys that assesses patient satisfaction via patient experience were also reviewed for themes and important determinants of patient satisfaction. The validated surveys were the Hospital CAHPS (HCAHPS) survey, Clinician and Group CAHPS (CG-CAHPS) for outpatient use, and Patient Satisfaction Questionnaire (PSQ) from Rand Health.[19-20] The questionnaire was developed through an iterative process that incorporated a psychometrician, health services researchers, and residency program faculty. Pilot testing using a think-aloud process was conducted with a group of internal medicine residents who were not part of the study. Internal assessment and feedback from these individuals improved the clarity of the items and the general format.

Knowledge of Factors Impacting Patient Satisfaction. Questions 1-20 assessed knowledge of the factors related to patient satisfaction, using a 5-point Likert-type scale (1 = not at all important to 5 = extremely important) (See Appendix 1 for Survey Instrument). For this study, patient satisfaction knowledge will refer to knowledge of the drivers of patient satisfaction.

Based on our literature review, we identified five domains of patient satisfaction that were assessed in the knowledge portion of the survey (Table 1). [2,18-24] To minimize bias and limit survey length, the final survey had 11 variables consistently related to patient satisfaction and 9 non-drivers that are commonly presumed to affect satisfaction but have been shown not to be associated. [2,19-24] Inclusion of commonly mistaken non-drivers in the survey were done because the authors thought it was important to also know where the current misconceptions regarding patient satisfaction.

An answer was *correct* if the resident strongly identified whether the item was related to patient satisfaction (answer of 4 or 5 for true variables/drivers and an answer of 1 or 2 for the non-drivers/false variables). Other responses were deemed *incorrect* (answer of 1, 2 or 3 for true variables/drivers and an answer of 3, 4 or 5 for the non-drivers/false variables). Selection of "3" for either category was regarded as a neutral response. Scoring was dichotomized to either correct or incorrect and was reported as a proportion of 100 percent (e.g., 10 correct answers = 50%).

Experiential Learning: Personal and Clinical Experiences. Questions 21-27 explored personal and clinical experiences that may impact knowledge of patient satisfaction. The personal experiences focused on personal or relative's/friend's hospitalization. Clinical experiences included clinical observations of faculty and peers with patients as well as feedback from evaluations of faculty, nurses, or patients. All these experiences were assessed independently. This portion was assessed using a 4-point Likert scale (1 = no impact to 4 = large impact; 0= not applicable). The respondents were dichotomized into two

groups: those who had the specific experience (response of 1 to 4) and those who did not (response of not applicable). Each experience item was analyzed as a continuous variable (degree of impact) and a categorical variable (dichotomized into those who had the specific experience and those who did not). For this analysis, the degree of impact and the dichotomized responses were correlated with the knowledge score.

Educational Sessions (Structured Didactics) on Patient Satisfaction. Questions 28-30 explored how often residents had received prior didactics on patient satisfaction. Respondents were asked to approximate how many times they had received an education session on patient satisfaction in medical school or residency. The last question of this section assessed how these didactics were given (e.g., lecture, workshops, or hospital orientation). Responses to this section were correlated with the knowledge score.

The final question asked residents to respond to the statement, "I am confident that my patients are satisfied with the care I provide." Responses were based on a 5-point Likert scale (1 = strongly disagree to 5 = agree). Demographic data also were collected on participants.

Survey distribution

A member of the research team administered an anonymous survey at resident teaching conferences from April 2013 to December 2013. Each completed survey was assigned a unique study number. Respondents were monitored to prevent duplicate submissions. Participation in the survey was voluntary, and no penalty was given for not participating; incentives were not given.

Statistical Analysis

Descriptive statistics were computed on demographic data. Frequencies and mean scores (including trainee year and program type) were compared using ANOVA. Point-biserial correlation was used to assess the correlation between the knowledge score and each type of learning experience (didactic or experiential [personal or clinical experiences with hospitalization]). Frequencies and means of the knowledge score stratified by type of learning experiences were also compared using ANOVA. Spearman's rho was used to assess the correlation between knowledge score and the degree of impact of the experiences. Data were analyzed using IBM SPSS Statistics version 23.

The study was approved by the Institutional Review Board and the Research and Development Committee.

Results

112 of 156 pediatric residents (72%) and 135 of 185 medicine residents (73%) completed the survey. We analyzed 239 surveys, excluding 8 for incomplete data. Internal medicine-pediatrics residents were grouped with the medicine residents. See Table 2 for demographics.

Knowledge of Factors Impacting Patient Satisfaction. Knowledge scores are shown in Table 3. The mean score was 70%. More upper-level residents incorrectly rated physician rank in medical school as a contributor to satisfaction ($p = 0.02$); otherwise, there were no differences in scores among trainee levels. Additionally, no difference was noted in knowledge scores when comparing pediatrics, internal

medicine, or med-peds (mean score ranged from 68-70%). In general, recognition of the correct drivers of patient satisfaction was high (80%), except for recognizing that patients' health status, age, and rating of the nurses' discussion about treatment are important drivers (Table 3).[2] More than half of all residents incorrectly reported the following were drivers of patient satisfaction: physician age, patient income, physician board certification, and patient level of education.

Experiential learning: Personal and clinical experiences. Of the 239 respondents, 87 (36%) had been hospitalized, and 187 (78%) had experienced hospitalization with a family member or friend. Hospitalization of a family member or friend was significantly correlated with higher knowledge of patient satisfaction drivers (p=.03). A significant relationship was not seen when assessing a trainee's own hospitalization.

The majority stated that observing peers (n = 238), observing supervisors (n = 239), and receiving feedback from faculty evaluations (n = 233) influenced their understanding of what affects patient satisfaction (99, 100, and 97%, respectively); these experiences did not correlate significantly with a higher knowledge score when dichotomized to those who had the experience compared to those who did not. When examining the level of impact (1 to 4) of these observations, higher impact ratings for faculty evaluations was the only factor that correlated with significantly higher knowledge scores, but the correlation was weak (p<.05, correlation coefficient .13; spearman rho correlation). Feedback from nurses and patients via evaluations did not significantly correlate with higher knowledge scores. Of note, only 55% (n=132) and 56% (n=134) of trainees reported feedback from nurses and patients, respectively, impacted their patient satisfaction knowledge.

Structured Didactics on Patient Satisfaction. Of the 239 respondents, 185 (77%) had attended an educational session on patient satisfaction. No significant difference was found in the knowledge score of those who had attended a session compared to those who had not. Almost half (47.5%) did not attend an educational session during residency, whereas only 67% had attended a session during medical school (n=161). Nonetheless, 88% (n= 211) of respondents agreed or strongly agreed that their patients are satisfied with their care. There was no significant difference in knowledge score in residents who rated a higher level of confidence.

Discussion

Residents or physicians in training are important contributors to patients' experiences in academic institutions and are key determinants of patient satisfaction.[4,10-12,18] We conducted a study to gauge residents' knowledge of drivers of patient satisfaction. We found the mean knowledge score for all resident levels to be 70%. Interestingly, the score did not increase with training level. Residents had difficulty recognizing that personal and demographic features of patients can affect their satisfaction. Specifically, they understood that interpersonal and communication skills are important (except for discussion about treatment by nurses), but surprisingly, they thought patients cared about board scores and board certification status.

Identifying the most common and universally accepted drivers of patient satisfaction can provide a foundation for curricula to address trainee knowledge gaps in these areas. Knowing what residents currently know is an important first step to changing their practices.[13-16] Based on these results, a suggested starting point may be curricula geared towards augmenting nurse inclusion in treatment plans given this was an area of deficiency. Regarding patient features, patients with more comorbidities may have lower satisfaction scores; however, how acute illness affects satisfaction remains undetermined.[2]

These patients have specific preferences based on their health status. Learning how to affectively decipher these preferences before making treatment plans is a potential focus area for future curricula.

We also investigated what factors contribute to residents' patient satisfaction knowledge to guide future educational initiatives. Most residents have not been hospitalized, which is not surprising given the age of trainees in this study (84% were younger than 30 years). Hospitalization of a family member or friend, however, resulted in a significantly higher knowledge of patient satisfaction compared to those who did not have this experience. Even though most residents had experienced the patient's perspective on hospitalization via a relative, friend, or personal hospitalization, these experiences may not be a practical approach to guide educational initiatives for trainees who did not have these experiences. A significant relationship was not seen when assessing a trainee's own hospitalization, likely due to the low number of individuals who had previously been hospitalized. On the other hand, peer and faculty observations are major ways residents are taught about patient satisfaction. Faculty role modeling is known to influence resident education, specifically shaping trainees' values, attitudes, and ethics; the modeling provided by faculty behavior is known as the hidden curriculum.[25] Peer observation and feedback are useful for medical learners as well, especially in the development of professionalism, teamwork, and interprofessional skills.[26-29] These topics may provide a potential area of focus to augment learning on patient satisfaction.

We also looked at structured didactics that aim to teach residents about patient satisfaction. Although 185 of 239 respondents (77%) had attended an educational session on patient satisfaction, most of these sessions were delivered in medical school, which may explain the lack of increase in knowledge with trainee years. Teaching and learning are not interchangeable, and there is a complex interplay of many factors, such as attention, cognitive load, practice, that result in knowledge being retained in long-term memory. Knowledge that is not used, rehearsed, or revisited is often forgotten. These factors may explain the lack of improvement in knowledge following a previous lecture on satisfaction.[13-15] The details of these didactic sessions were not addressed by our survey, thereby precluding the ability to make any comment on the content. A recent single-site survey found that bundled interventions that included didactics, real-time feedback on patient satisfaction scores, and monthly recognition of trainees with high scores resulted in improvement in patient satisfaction scores.[18] Moreover, didactics in patient satisfaction alone may not be sufficient to augment patient satisfaction knowledge and change physician behavior.

Limitations

The study was performed at a single academic center, which may limit generalizability. However, the participants in this study rotate through multiple, highly diverse affiliated institutions, and the results are likely externally valid. The survey tool, although developed through an iterative process and pilot tested, has not previously been validated. The survey was however grounded in the literature and derived from validated survey measures of patient satisfaction developed for performance metrics purposes. Several questions asked the residents to recall previous learning experiences, and the results may be limited by recall bias. Another limitation is the lack of correlation with the resident's clinical performance. The anonymous nature of the survey prevented us from correlating knowledge scores, experiences, and confidence of a resident with actual provider satisfaction scores or evaluations from patients, which would have enabled us to correlate knowledge with behavior. However, as the first step in understanding the trainees' experiences, the benefit of anonymity and honesty of reporting outweighed the ability to correlate knowledge with actual clinical behavior.

Conclusion

With the move towards patient-centered care, patient satisfaction and experience are core outcomes for hospitals today.[6] Residents are important providers of medical care in academic institutions; their daily interactions with patients impact satisfaction, hospital quality metrics, and reimbursement.[4,10-12,18] We demonstrated some gaps in knowledge concerning drivers of patient satisfaction that did not vary by training year. Residents' awareness of patient satisfaction was impacted by experiential learning (clinical and personal), specifically hospitalization of a close contact, peer and faculty observation, and faculty evaluations. Hospital administrators and educators should recognize didactics alone may not be sufficient to augment trainees' knowledge of factors related to patient satisfaction. More consideration should be given to the effect of peer and faculty role modeling when developing future interventions to improve satisfaction for patients cared for by resident providers.

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Conflict of Interest Statement: To the best of our knowledge, the authors of this manuscript report no conflicts of interest.

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Ethics approval: Institutional Review Board and the Veterans Affairs Research and Development Committee.

Data sharing statement: No additional data are available

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Table 1. Domains of Patient Satisfaction and Linked Survey Question

Driver Domains	Abbreviated Survey Question	Percentage Correct (95% CI)
Accessibility, Convenience, and Responsiveness	Responsiveness of ancillary staff	94.1% (90.592% to 96.627%)
Communication	Physician explanations	96.7% (94.853% to 98.976%)
	Nurse willingness to listen	96.2% (93.203% to 98.148%)
	Nurse explanations	80.3% (74.931% to 85.007%)
	Physician listening	97.1% (94.293% to 98.710%)
	Discussion about treatment by nurses	67.4% (61.224% to 73.086%)
Interpersonal Manner of Caregiver	Courtesy and respect from nurses	92.9% (89.078% to 95.661%)
	Courtesy and respect from physicians	96.2% (93.203% to 98.148%)
Personal Factors of Patient	Poor health status of patient	55.6% (49.300% to 61.861%)
	Age of patient	15.1% (10.942% to 20.026%)
Technical Quality and Care from Doctors	Thoroughness and Competence of physician	87.4% (82.783% to 91.210%)

Table 2. Demographics of Participants

Post-graduate year (PGY)	**N (%)**
PGY-1	118 (49.4)
PGY-2	62 (25.9)
PGY-3 and 4	59 (24.7)
Residency Program	**N (%)**
Internal Medicine	118 (49.4)
Pediatrics	96 (40.2)
Medicine/Pediatrics	14 (5.9)
Other [a]	11 (4.6)
Age [b]	**N (%)**
≤ 29	201 (84.1)
> 29	37 (15.5)
Gender [b]	**N (%)**
Male	95 (39.7)
Female	143 (59.8)
Ethnicity [c]	**N (%)**
Hispanic	17 (7)
Black	11 (4.6)
White	118 (49.4)
Asian	88 (37)
Other	5 (2)
Additional training [b]	**N (%)**
None	206 (86.6)
MPH	8 (3.4)
MBA	2 (0.8)
Other	22 (9.2)

[a]This category includes anesthesia, family medicine, surgery, and emergency medicine.
[b]One respondent did not answer.
[c]Two respondents did not answer this question and 2 respondents selected multiple categories.

Table 3. Results of Patient Satisfaction Knowledge Survey

Driver or Non-Driver	Abbreviated Survey Question	Percentage Correct (95% CI)
Driver	Poor health status of patient	55.6% (49.300% to 61.861%)
	Physician explanations	96.7% (94.853% to 98.976%)
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	Discussion about treatment by nurses	67.4% (61.224% to 73.086%)
Non-driver	Physician USMLE score	92.9% (89.078% to 95.661%)
	Income of patient	48.5% (42.236% to 54.871%)
	Physician age	29.3% (23.780% to 35.296%)
	Medical school attended	74.1% (68.220% to 79.317%)
	Board certification status of physician	44.8% (38.547% to 51.119%)
	Education level of patient	20.9% (16.117% to 26.425%)
	Physician rank in medical school	90.4% (86.129% to 93.651%)
	Gender of patient	64.4% (58.208% to 70.315%)
	Gender of physician	52.3% (45.960% to 58.587%)

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Appendix 1: Survey Instrument

We are conducting a research study to measure residents' awareness of factors that can influence patient satisfaction. Residents, like you, are important providers of medical care in academic institutions, and as such have an impact on patient satisfaction. Given the important role you play in patient care, we want to learn what you believe affects the satisfaction of your patients with the care you provide. For pediatric patients, the survey refers to parent satisfaction only.

Part I: Tell us about you.

1. What year are you in residency?

- ☐ PGY-1
- ☐ PGY-2
- ☐ PGY-3
- ☐ PGY-4
- ☐ Other (specify) _____

2. Type of residency program

- ☐ Internal Medicine
- ☐ Pediatrics
- ☐ Internal Medicine-Pediatrics
- ☐ Preliminary Program
- ☐ Transitional Program
- ☐ Surgery
- ☐ Obstetrics and Gynecology
- ☐ Other (specify) _____

3. What is your age range?

- ☐ Under 25
- ☐ 25-29
- ☐ 30-34
- ☐ 35 and over

4. What gender are you?

- ☐ Male
- ☐ Female

5. Are you of Hispanic or Latino origin?

- ☐ Yes
- ☐ No

6. What is your race? (Mark all that apply)

- ☐ Black or African American
- ☐ White
- ☐ Asian
- ☐ Other (specify) _____

7. Do you have additional graduate degrees?

- ☐ No
- ☐ MPH
- ☐ MBA
- ☐ Other (specify) _____

Part II: Understanding Drivers of Patient Satisfaction

Think about the factors listed below that may influence the satisfaction of patients with the care you provide. How important or unimportant do you consider each of the following influences on the satisfaction of your patients with your care?

1. Ranking of medical school that physician attended	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
2. Poor health status of patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
3. Physician explaining tests, treatments, diagnosis	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
4. Board certification status of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
5. Responsiveness of ancillary staff to patient's needs	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
6. Level of education of patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
7. Thoroughness and competence of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
8. Nurses willingness to listen to patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
9. Physician rank in medical school	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
10. Explanations provided by nurses	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
11. Courtesy and respect from nurses	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
12. USMLE score of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
13. Income level of patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
14. Age of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
15. Courtesy and respect from physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
16. Listening skills of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
17. Age of patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
18. Gender of patient	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
19. Gender of physician	Not at all Important	Slightly Important	Important	Very Important	Extremely Important
20. Discussions about treatment provided by nurse	Not at all Important	Slightly Important	Important	Very Important	Extremely Important

Part III: Personal Experiences

Which of the following experiences have added to your understanding of what affects patients' satisfaction with the care you provide? If you have not personally had any of the experiences below, please select N/A (not applicable).

21. Your own hospitalization

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

22. Hospitalization of a family member or friend

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

23. Observation of your peer's interaction with patients (i.e. other interns or residents)

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

24. Observation of supervisor's interactions with patients (i.e. attending)

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

25. Feedback from faculty evaluations

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

26. Feedback from nursing evaluations

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

27. Feedback from patient evaluations

☐ N/A ☐ No impact ☐ Slight Impact ☐ Moderate Impact ☐ Large Impact

Part IV: Education about Patient Satisfaction

28. How many times have you had an educational session that discussed patient satisfaction during medical school?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 or more

29. How many times have you had an educational session that discussed patient satisfaction during residency?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 or more

30. If you have attended an educational session on patient satisfaction, check all that apply.

☐ Resident lecture (i.e. noon conference, grand rounds, sub-specialty conference, etc.)
☐ Medical student lecture
☐ Workshop on patient safety at a local or national meeting
☐ Hospital orientation
☐ I have never attended a lecture on patient satisfaction

31. Please answer the following: I feel confident that my patients are satisfied with the care I provide.

☐ Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree

Thank you for taking the time to complete this survey. Your opinion matters!!

STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract **-Page 1**
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found **-Page 3**
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported **-Page 5**
Objectives	3	State specific objectives, including any prespecified hypotheses **-Page 5**
Methods		
Study design	4	Present key elements of study design early in the paper -**Page 5**
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection **-Page 5-6**
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up **-Page 5-7**
		(*b*) For matched studies, give matching criteria and number of exposed and unexposed **Page: Not applicable**
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable **-Page 5-7**
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group **-Page 6-7**

Bias	9	Describe any efforts to address potential sources of bias **-Page 5-7**
Study size	10	Explain how the study size was arrived at **-Page 5**
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why **Page: Not applicable**
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding **-Page 7**
		(*b*) Describe any methods used to examine subgroups and interactions -**Page 7**
		(*c*) Explain how missing data were addressed **Page: Not applicable**
		(*d*) If applicable, explain how loss to follow-up was addressed **Page: Not applicable**
		(*e*) Describe any sensitivity analyses **Page: Not applicable**
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed -**Page 7**
		(b) Give reasons for non-participation at each stage **Page: Not applicable**
		(c) Consider use of a flow diagram **Page: Not applicable**
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders -**Page 7**
		(b) Indicate number of participants with missing data for each variable of interest

		-**Page 7**
		(c) Summarise follow-up time (eg, average and total amount) **Page: Not applicable**
Outcome data	15*	Report numbers of outcome events or summary measures over time -**Page 7-8**
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included -**Page 7-8**
		(*b*) Report category boundaries when continuous variables were categorized -**Page 7-8**
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period **Page: Not applicable**
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses **Page: Not applicable**
Discussion		
Key results	18	Summarise key results with reference to study objectives -**Page 8-9**
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias -**Page 9**
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence -**Page 9**
Generalisability	21	Discuss the generalisability (external validity) of the study results -**Page 9**
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based -**Page 10**

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.