


# Inter-specialty variation of the Press Ganey Outpatient Medical Practice Survey

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## Abstract

Measuring patient satisfaction scores and interpreting factors that impact their variation is of importance as scores influence various aspects of health care administration. Our objective was to evaluate if Press Ganey scores differ between medical specialties.

New patient visits between January 2014 and December 2016 at a single tertiary academic center were included in this study. Press Ganey scores were compared between specialties using a multivariable logistic mixed effects model. Secondary outcomes included a comparison between surgical versus non-surgical specialties, and pediatric versus adult specialties. Due to the survey's high ceiling effect, satisfaction was defined as a perfect total score.

Forty four thousand four hundred ninety six patients met inclusion criteria. Compared to internal medicine, plastic surgery, general surgery, dermatology, and family medicine were more likely to achieve a perfect overall score, as, with odds ratios of 1.46 ( $P = .02$ ), 1.29 ( $P = .002$ ), 1.22 ( $P = .004$ ), and 1.16 ( $P = .02$ ) respectively. Orthopaedics, pediatric medicine, pediatric neurology, neurology, and pain management were less likely to achieve satisfaction with odds ratios of 0.85 ( $P = .047$ ), 0.71 ( $P < .001$ ), 0.63 ( $P = .005$ ), 0.57 ( $P < .001$ ), and 0.51 ( $P = .006$ ), respectively. Compared to pediatric specialties, adult specialties were more likely to achieve satisfaction (OR 1.73;  $P < .001$ ). There were no significant differences between surgical versus non-surgical specialties.

Press Ganey scores systematically differ between specialties within the studied institution. These differences should be considered by healthcare systems that use patient satisfaction data to modify provider reimbursement.

**Abbreviations:** CI = confidence interval, DO = Doctor of Osteopathic Medicine, MD = Doctor of Medicine, MORs = median odds ratios, NP = nurse practitioner, OR = odds ratio, PA = physician assistant, PGOMPS = Press Ganey Outpatient Medical Practice Survey, SD = standard deviation.

**Keywords:** patient satisfaction, Press Ganey, specialties

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## 1. Introduction

The importance of measuring patient satisfaction scores in the United States has greatly increased in recent years. This is in part due to the fact that The Patient Protection and Affordable Care Act enables Medicare to make incentive payments to hospitals based on specific quality domains, including the patient experience of care.<sup>[1]</sup> The Press Ganey Outpatient Medical Practice Survey (PGOMPS) is a patient satisfaction metric that has been commonly used by a variety of health care systems to assess a variety of aspects of health care delivery, including provider performance.<sup>[2]</sup>

Much attention in the current literature has demonstrated the limitations of patient satisfaction metrics and their use in adequately determining the value or quality of care delivered. Prior work has established potential factors that may influence PGOMPS scores for an array of specialties. For example, factors associated with increased patient satisfaction include more time spent with physician,<sup>[3,4]</sup> increasing patient age,<sup>[5-7]</sup> ease of appointment scheduling,<sup>[3,8]</sup> and being offered an intervention.<sup>[9]</sup> Factors associated with lower patient satisfaction scores include increased wait time,<sup>[5,10,11]</sup> increased length of hospital stay,<sup>[12]</sup> greater time between visit and survey completion,<sup>[12]</sup> physician burnout,<sup>[13]</sup> worse patient pain level,<sup>[14,15]</sup> and greater anxiety/depression level of patient.<sup>[14]</sup> Factors with conflicting evidence in the literature include sex of the patient,<sup>[4,7,15,16]</sup> sex of the

provider,<sup>[17,18]</sup> provider race,<sup>[19–22]</sup> patient race,<sup>[4,16,21,23,24]</sup> patient education level and medical understanding,<sup>[24,25]</sup> increased distance traveled to receive care,<sup>[5,26]</sup> and setting/location of encounter.<sup>[16,24,27,28]</sup> These factors have mostly been identified in specialty-specific domains or have been evaluated in a hospital system as a whole.

There are inherent differences between specialties with regard to the populations treated (for example, age, as in pediatrics vs geriatrics) and characteristics of conditions encountered (for example, acuity, as in hypertension vs trauma), and such specialty-specific factors may in turn influence patient satisfaction. Still, it remains unclear whether and to what degree patient satisfaction scores may be influenced by the medical or surgical specialty type of their treating provider.

The primary purpose of our study was to test our a priori null hypothesis that PGOMPS overall scores do not differ between specialties. The secondary purpose was to test our a priori null hypothesis that PGOMPS provider sub-scores do not differ between specialties.

## 2. Materials and methods

### 2.1. Study design

This study was reviewed and approved by our institutional review board. Our institution has contracted with the Press Ganey Corporation to measure and track patient satisfaction scores in outpatient encounters. Results are analyzed and considered as part of an ongoing quality improvement initiative. An email is automatically sent to patients following their clinic appointment requesting them to complete the PGOMPS electronically via an embedded link. If a patient has not completed the survey after 5 days, an additional request is sent. The survey link is available for the patient for up to 30 days. Data are compiled by the Press Ganey Corporation.

There are 25 questions that comprise the Press Ganey Medical Practice Survey. Questions are divided into 6 subdomains: access, moving through your visit, nurse or assistant, care provider, personal issues, and overall assessment.<sup>[9]</sup> Given this, the PGOMPS can be utilized to investigate a patient's satisfaction with specific components related to the overall experience such as satisfaction with the provider, the staff and other components. Each question response is measured on a Likert scale ranging from 1 (indicating very poor) to 5 (indicating very good). Responses are converted to a 0 to 100-point scale, and the mean overall score is calculated from the mean scores of the 6 individual subdomains.

### 2.2. Study participants

We retrospectively reviewed patient satisfaction scores from unique clinical patient encounters at a single academic hospital system between January 2014 and December 2016. Patient encounters included adult patients ( $\geq 18$  years) for which the survey was completed by the patient. Surveys for the pediatric population ( $< 18$  years) were completed by a parent or legal guardian. Return and postoperative visits were excluded, as were patients with a primary language other than English. Survey data was linked to the providers specialty. The medical or surgical specialty of each provider was recategorized more broadly by the residency training of the physician.<sup>[29]</sup> For example, cardiology was categorized as internal medicine.

### 2.3. Study outcomes

Study outcomes included the overall score on the PGOMPS and the score for the care provider subdomain of the PGOMPS (10 questions). Due to the large ceiling effect of the PGOMPS, and the ample sample size available for analysis, we dichotomized the scores for both outcomes as perfect satisfaction (100 pts) and less than perfect satisfaction.<sup>[5,14,30]</sup> The percent of encounters receiving perfect scores was evaluated between specialties with internal medicine as the reference group for both overall score and provider sub-scores. The percent of receiving perfect score was also compared between bundled surgical and non-surgical specialties, and between pediatric and non-pediatric specialties.

### 2.4. Statistical analysis

We summarized patient demographics, specialty category, and PGOMPS scores. For continuous variables, mean [standard deviation (SD)] and median [interquartile range (IQR)] were calculated. For categorical variables, count (percentage %) was calculated.

Our primary outcome was perfect satisfaction on the overall score, and our secondary outcome was perfect satisfaction with the care provider (provider sub-score). We compared each outcome to surgical specialty using logistic mixed effect models adjusting for potential factors that could affect the PGOMPS scores, including patient age, provider sex, patient sex, and provider type (Physician Assistant/Nurse Practitioner, Doctor of Osteopathic Medicine DO, and Doctor of Medicine MD). Provider ID was included as a random effect with an exchangeable correlation matrix to account for clustering of outcomes within providers. Similar models were constructed for surgical vs non-surgical specialty and adult vs pediatric patients, except that in the adult vs pediatric patient analysis we did not adjust for patient age (due to the correlation among these 2 variables). Odds ratios (ORs), 95% confidence intervals (CIs), and *P* values were reported. In addition, we calculated median odds ratios (MORs) and CIs for the adjusted models to assess the impact of clustering by provider, relative to the impact of the fixed effects assessed by our models.<sup>[31,32]</sup> To evaluate if the PGOMPS subdomains may account for the differences in satisfaction seen in the overall score, a comparison of the percent of patients perfectly satisfied with the specific subdomains for the specialty that was the most likely to achieve overall satisfaction was compared to internal medicine using a Chi-Squared test. The same comparison was performed between internal medicine and the specialty that was the least likely to achieve overall satisfaction. All analyses were performed using SAS 9.4. Statistical significance was assessed at the 0.05 level, and all applicable tests were two-tailed.

## 3. Results

### 3.1. Study patients

We identified a total of 96,361 patients during our study period; 1,335 patients were excluded for English as a second language and 50,530 were excluded for post-op/follow-up visits. In total, 44,496 patients met inclusion criteria. Of the included patients, 37,478 (83.23%) were adult visits and 7018 (15.77%) were pediatric visits. Additional demographic and visit-specific data are provided in Table 1.

**Table 1**  
**Demographics.**

Variable	Level	Summary (N = 44496)
Adult vs Pediatric	Adults	37478 (84.23%)
	Pediatrics	7018 (15.77%)
Age	Mean (SD)	45.39 (22.31)
	Median(IQR)	48.79 (28.92–63.79)
	Range	0–100.89
Age group	18-29	5217 (11.72%)
	30-39	6091 (13.69%)
	40-49	4999 (11.23%)
	50-59	7184 (16.15%)
	60-69	8705 (19.56%)
	<18	6584 (14.80%)
	≥ 70	5716 (12.85%)
Care provider rollup	Not perfect	16694 (37.52%)
	Perfect	27802 (62.48%)
Overall survey rollup	Not perfect	31963 (71.83%)
	Perfect	12533 (28.17%)
Patient sex	Male patient	17878 (40.18%)
	Female patient	26618 (59.82%)
Provider sex	Male patient	29283 (65.81%)
	Female patient	15213 (34.19%)
Provider type	DO	1720 (3.87%)
	MD	37208 (83.62%)
	PA/NP	5568 (12.51%)
Specialty categorization	Pain management	173 (0.39%)
	Dermatology	5153 (11.58%)
	Otolaryngology	2268 (5.10%)
	Family medicine	4440 (9.98%)
	General surgery	1670 (3.75%)
	Internal medicine	7923 (17.81%)
	Neurology	1276 (2.87%)
	Neurosurgery	871 (1.96%)
	Obstetrics and gynecology	3879 (8.72%)
	Ophthalmology	5560 (12.50%)
	Orthopaedic surgery	3570 (8.02%)
	Pediatric medicine	2669 (6.00%)
	Pediatric neurology	447 (1.00%)
	Pediatric surgery	883 (1.98%)
	Physical medicine and rehab	1865 (4.19%)
	Plastic surgery	488 (1.10%)
	Radiation oncology	89 (0.20%)
Radiology	39 (0.09%)	
Surgery	Urology	1233 (2.77%)
	Non-surgery	34674 (77.93%)
	Surgery	9822 (22.07%)

**3.2. Study outcomes**

Table 2 Shows a comparison between specialties in receiving perfect satisfaction for the overall score with internal medicine as the reference group, with and without controlling for age, provider sex, patient sex, and provider type. Given a MOR of 1.34 (95% CI, 1.30–1.39), the clustering effect of provider was generally stronger than specialty.

The likelihood of achieving perfect satisfaction with the overall score significantly increased with patient age (Table 2). There was no significant difference in satisfaction with PA/NP, DO and MD providers. Overall scores did not differ based on patient or provider sex.

Table 3 Shows the likelihood of a provider receiving a perfect score on the provider sub-score. Again, the MOR 1.42 (95% CI,

1.38–1.47) indicates that the clustering effect of provider was generally stronger than specialty.

Compared to pediatric specialties, adult specialties were more likely to achieve satisfaction with the overall score (OR 1.73; 95% CI 1.29–2.32; *P* < .001) and Provider Sub-score 1.21 (OR 1.21; 95% CI 0.93–1.57; *P* < .0001) (Table 4).

A comparison of the individual subdomains of PGOMPS between plastic surgery and internal medicine revealed that plastic surgery patients were significantly more satisfied with each PGOMPS subdomain than internal medicine patients except for moving through the visit (Table 5). A comparison of the individual subdomains of PGOMPS between pain management and internal medicine revealed that pain management patients were significantly less satisfied with each PGOMPS subdomain than internal medicine patients (Table 6).

**4. Discussion**

The main finding of this study is that patient satisfaction scores differed between medical specialties within a tertiary academic health care system.

Reasons for the observed differences in patient satisfaction scores between specialties are speculative. A comparison of the individual subdomains between internal medicine with the most satisfied specialty (plastic surgery) revealed that these patients are more satisfied than internal medicine with each component. The reverse was true for the least satisfied specialty (pain management). These findings may suggest that the differences in satisfaction may be inherent to the patient population makeup seen by the specialty rather than a specific attribute of that specialty or physicians in the specialty. Clearly, different specialties treat very different medical conditions, which exhibit variation in prognoses, effective treatment options, and/or associated psychological characteristics. Certain specialties more commonly treat patients reporting acute or chronic pain, for example, and there is published evidence to suggest that this patient cohort is more likely to report lower PGOMPS scores.<sup>[4,14]</sup> The findings of the current study support this concept, given that the specialties that are primarily tasked with the treatment of physical pain and disability were less likely to receive perfect provider sub-scores (orthopaedic surgery, physical medicine and rehabilitation, and pain management). Still, the study design does not allow for definitive conclusions to be drawn in this regard.

Alternatively, the differences in patient satisfaction between specialties that were observed here may be due to a variety of other clinical encounter variables—unrelated to patient factors such as medical diagnosis—that systematically differ between specialties. These variables could include provider personality / empathy, patient wait time, provider time spent with the patient, access, parking, and a variety of other logistical factors involved with the delivery of health care. These types of systematic differences between the specialties—if present—may affect the way care is delivered and help to explain the observed differences in patient satisfaction scores.

A review of prior literature regarding variables that have been associated with patient satisfaction is limited by study heterogeneity, but is worth addressing. With regard to interventions, patients who are offered an intervention during their visit (steroid injection, scheduled surgery, etc) are more likely to give higher PGOMPS scores than those who are not.<sup>[9]</sup> Along these lines, the denial of requested services from a patient negatively impacts

**Table 2**  
**Association between perfect overall satisfaction and specialties.**

Variable	Unadjusted		Adjusted*	
	Odds ratio (95%CI)	P value	Odds Ratio (95%CI)	P value
Provider type				
Provider type MD	Reference	–	Reference	–
Provider type DO	0.99 (0.80–1.23)	.91	1.02 (0.84–1.24)	.86
Provider type PA/NP	1.06 (0.95–1.18)	.32	1.04 (0.94–1.16)	.44
Patient age				
Patient age ≥70	Reference	–	Reference	–
Patient age 60–69	0.91 (0.84–0.97)	.007	0.90 (0.84–0.97)	.004
Patient age 50–59	0.82 (0.76–0.88)	<.001	0.81 (0.75–0.87)	<.001
Patient age 40–49	0.70 (0.64–0.76)	<.001	0.68 (0.63–0.74)	<.001
Patient age <18	0.54 (0.49–0.59)	<.001	0.61 (0.54–0.68)	<.001
Patient age 30–39	0.62 (0.57–0.68)	<.001	0.60 (0.56–0.66)	<.001
Patient age 18–29	0.52 (0.48–0.57)	<.001	0.51 (0.46–0.56)	<.001
Patient sex				
Male patient	Reference	–	Reference	–
Female patient	0.98 (0.93–1.02)	.32	0.99 (0.95–1.04)	.75
Provider sex				
Female provider	1.03 (0.95–1.11)	.52	1.04 (0.97–1.13)	.26
Male provider	Reference	–	Reference	–
Provider specialty				
Radiation oncology	1.76 (1.00–3.09)	.05	1.66 (0.96–2.88)	.07
Plastic surgery	1.31 (0.94–1.82)	.11	1.46 (1.06–2.01)	.020
General surgery	1.26 (1.07–1.49)	.006	1.29 (1.10–1.51)	.002
Dermatology	1.17 (1.01–1.34)	.03	1.22 (1.06–1.39)	.004
Family medicine	1.00 (0.88–1.14)	.97	1.16 (1.02–1.31)	.02
Obstetrics and Gynecology	0.90 (0.78–1.04)	.15	1.12 (0.97–1.29)	.13
Internal medicine	Reference	–	Reference	–
Otolaryngology	0.89 (0.74–1.07)	.22	0.97 (0.81–1.16)	.73
Neurosurgery	0.98 (0.77–1.24)	.84	0.96 (0.76–1.21)	.74
Physical medicine and rehab	0.87 (0.70–1.08)	.20	0.92 (0.75–1.14)	.47
Ophthalmology	0.92 (0.79–1.06)	.25	0.92 (0.80–1.06)	.274
Pediatric surgery	0.63 (0.49–0.79)	<.001	0.82 (0.64–1.05)	.11
Urology	0.81 (0.63–1.05)	.11	0.80 (0.63–1.03)	.08
Radiology	0.62 (0.26–1.46)	.27	0.65 (0.28–1.53)	.32
Orthopaedic surgery	0.82 (0.69–0.96)	.01	0.85 (0.73–1.00)	.05
Pediatric medicine	0.56 (0.48–0.64)	<.001	0.71 (0.60–0.84)	<.001
Pediatric neurology	0.50 (0.36–0.68)	<.001	0.63 (0.46–0.87)	.005
Neurology	0.58 (0.47–0.71)	<.001	0.57 (0.47–0.69)	<.001
Pain management	0.50 (0.31–0.82)	.006	0.51 (0.31–0.83)	.006
MOR			1.34 (1.30–1.39)	–

\* Adjusting for patient age, provider gender, patient gender, and provider type.

Shading key: green = statistically more likely to receive perfect satisfaction than reference (internal medicine); gray = no statistically significant difference compared to reference; red = statistically less likely to achieve perfect satisfaction than reference.

patient satisfaction scores.<sup>[33]</sup> In the current study, there was no statistically significant difference between surgical versus non-surgical specialties for both the overall score and provider sub-score.

While the current study did not attempt to address the effect of concept of patient complexity / disease severity on patient satisfaction, previous literature has demonstrated somewhat contradictory findings. In some cases, providers who treat patients with complex comorbidities<sup>[12]</sup> or worse disease severity, functional status, and/or prognosis<sup>[24,34–36]</sup> appear to be more likely to receive lower patient satisfaction scores. For instance, Rogers et al showed that patients with worse injury severity scores were statistically less likely to be satisfied with their care.<sup>[37]</sup> Other studies disagree, finding no statistically significant association,<sup>[38–40]</sup> and still others note that patients with worse disease severity had higher patient satisfaction scores.<sup>[6,7]</sup> With

some degree of consistency, however, authors have shown that patients with worse psychiatric health are less likely to give perfect patient satisfaction scores.<sup>[14]</sup>

Although not the primary focus of our study, there are several other results worth highlighting here. We found that the sex of a patient did not influence the overall Press Ganey score, consistent with previous literature.<sup>[15,41,42]</sup> We did find, however, that female patients were more likely than men to be satisfied with their provider, in some contrast to prior work.<sup>[7]</sup> Delanois et al, who found no difference between male and female patients with regards to overall scores, did find that men and women had different priorities in factors that influenced their overall score.<sup>[15]</sup>

We also found there to be no difference in likelihood of receiving an overall perfect score between male and female providers, consistent with prior work.<sup>[42]</sup> Still, we found that

**Table 3**  
**Association between perfect provider satisfaction and specialties.**

Variable	Unadjusted		Adjusted*	
	Odds ratio(95%CI)	P value	Odds ratio(95%CI)	P value
Provider type				
Provider type MD	Reference	–	Reference	–
Provider type PA/NP	1.03 (0.92–1.15)	.63	0.99 (0.89–1.11)	.86
Provider type DO	0.91 (0.74–1.13)	.40	0.94 (0.76–1.15)	.53
Patient age				
Patient age ≥70	Reference	–	Reference	–
Patient age 60–69	0.96 (0.89–1.03)	.23	0.95 (0.88–1.02)	.18
Patient age 50–59	0.82 (0.76–0.89)	<.001	0.81 (0.75–0.88)	<.001
Patient age 40–49	0.75 (0.69–0.81)	<.001	0.73 (0.67–0.80)	<.001
Patient age <18	0.67 (0.62–0.74)	<.001	0.71 (0.64–0.79)	<.001
Patient age 30–39	0.66 (0.61–0.71)	<.001	0.64 (0.59–0.69)	<.001
Patient age 18–29	0.55 (0.51–0.60)	<.001	0.53 (0.49–0.58)	<.001
Patient sex				
Female patient	1.04 (0.99–1.08)	.09	1.05 (1.01–1.10)	.02
Male patient	Reference	–	Reference	–
Provider sex				
Female provider	1.14 (1.06–1.24)	<.001	1.12 (1.03–1.21)	.007
Male provider	Reference	–	Reference	–
Provider specialty				
Radiation oncology	1.52 (0.81–2.85)	.20	1.38 (0.74–2.59)	.31
Obstetrics and gynecology	1.10 (0.95–1.28)	.20	1.30 (1.12–1.52)	<.001
Plastic surgery	1.08 (0.75–1.55)	.68	1.18 (0.82–1.68)	.37
Dermatology	1.12 (0.96–1.31)	.14	1.16 (0.99–1.34)	.06
General surgery	1.12 (0.94–1.34)	.20	1.14 (0.95–1.36)	.16
Family medicine	0.96 (0.84–1.10)	.58	1.10 (0.97–1.26)	.15
Neurosurgery	1.03 (0.80–1.33)	.80	1.04 (0.81–1.34)	.77
Radiology	0.96 (0.44–2.12)	.92	1.03 (0.47–2.27)	.94
Internal medicine	Reference	–	Reference	–
Neurology	0.96 (0.79–1.16)	.65	0.95 (0.78–1.15)	.58
Pediatric medicine	0.83 (0.73–0.96)	.009	0.94 (0.80–1.10)	.43
Otolaryngology	0.83 (0.68–1.02)	.08	0.89 (0.73–1.09)	.26
Urology	0.82 (0.63–1.07)	.14	0.85 (0.65–1.10)	.21
Ophthalmology	0.85 (0.73–1.00)	.05	0.85 (0.73–1.00)	.05
Physical medicine and rehab	0.74 (0.59–0.93)	.010	0.79 (0.63–1.00)	.05
Orthopaedic surgery	0.76 (0.64–0.90)	.001	0.79 (0.67–0.94)	.007
Pediatric surgery	0.66 (0.52–0.83)	<.001	0.77 (0.60–0.98)	.03
Pediatric neurology	0.60 (0.45–0.80)	<.001	0.68 (0.51–0.91)	.010
Pain management	0.35 (0.23–0.55)	<.001	0.35 (0.23–0.55)	<.001
MOR			1.42 (1.38–1.47)	–

\* Adjusting for patient age, provider gender, patient gender and provider type.

Shading key: green = statistically more likely to receive perfect satisfaction than reference (internal medicine); gray = no statistically significant difference compared to reference; red = statistically less likely to achieve perfect satisfaction than reference.

**Table 4**  
**Association between perfect overall and provider satisfaction and adult vs pediatric patients.**

Variable	Unadjusted		Adjusted*	
	Odds Ratio (95%CI)	P value	Odds Ratio (95%CI)	P value
Overall				
Adults	1.74 (1.30–2.33)	<.001	1.73 (1.29–2.32)	<.001
Pediatrics	Reference	–	Reference	–
provider				
Adults	1.21 (0.93–1.57)	.16	1.21 (0.93–1.57)	.26
Pediatrics	Reference	–	Reference	–

\* Adjusting for provider gender, patient gender and provider type.

**Table 5**  
**Comparison of PGOMPS\* subdomains: plastic surgery vs internal medicine.**

	Plastic Surgery	Internal Medicine	P Value
Access to care	51.23	44.00	.002
Moving through the visit	52.66	48.72	.091
Care provider	79.03	74.72	.023
Nursing	76.23	64.32	<.001
Personal concerns	76.23	68.41	<.001
Overall care	81.76	75.45	.002

\* PGOMPS -Press Ganey Outpatient Medical Practice Survey.

**Table 6**  
**Comparison of PGOMPS\* subdomains: pain management vs internal medicine.**

	Pain management	Internal medicine	P value
Access	26.01	44.00	<.001
Moving through visit	31.8	48.72	<.001
Care provider	36.41	74.72	<.001
Nursing	60.69	64.32	<.001
Personal concerns	36.41	68.41	<.001
Overall care	17.62	75.45	<.001

\* PGOMPS -Press Ganey Outpatient Medical Practice Survey.

female providers were more likely to receive a perfect provider sub-score than male providers. These findings differ from previous literature in primary care settings and ED visits.<sup>[17,18,43]</sup>

Consistent with previous literature, we found that pediatric populations were less satisfied than adult populations for both overall and provider sub-scores.<sup>[44]</sup>

Finally, we found that there was no difference between MD, DO, and PA/NP scores. This is consistent with Roblin et al who found no difference in the primary care setting,<sup>[45]</sup> but in contrast to other data demonstrating that patients give higher satisfaction scores to NPs than physicians in ED.<sup>[46–48]</sup>

## 5. Limitations

We acknowledge that this study has several limitations. First, only unique patient encounters were included. An evaluation of how scores may alter during subsequent visits would be informative. Another limitation of our study is that our analysis was performed retrospectively and may be subject to recall bias. Our study is also limited by non-response bias, a trait inherent to the PGOMPS survey. PGOMPS responders have previously been shown to differ from non-responders in terms of age, sex, insurance type, and subspecialty.<sup>[49]</sup> The response rate at our institution has previously been reported to range from 8.9 to 16.5%, and it is uncertain how this may affect our results.<sup>[9,30]</sup> Nevertheless, at some institutions PGOMPS is utilized as a surrogate for measuring quality without regard to these real-world limitations. Lastly, it is not possible to statistically decouple the provider effect from the effect of their specialty. Although significant differences in satisfaction were observed between specialties, median odds ratios evaluating the provider clustering effects suggested this was stronger than the subspecialty effect.

Another limitation is our study analyzed patient satisfaction scores within a single healthcare system and therefore our findings may not be generalizable. Likewise, PGOMPS evaluates patient satisfaction scores in the outpatient setting. Given that certain specialties and providers may spend a greater proportion of their time in the inpatient setting, our analyses and the PGOMPS as a whole potentially may be biased against these certain specialties. Finally, scores were assigned to the residency training of a provider. Certainly, there could be much variation in a patient population and treatment modalities offered even within a particular specialty. Further work assessing the differences among subspecialties in these and other fields would be informative.

## 6. Conclusions

In conclusion, this study demonstrates that differences exist in the likelihood of a provider to receive a perfect patient satisfaction

score, as measured by PGOMPS, between differing medical specialties. These differences should be considered by healthcare systems that use patient satisfaction data to inform health care decision making.

## Author contributions

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