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Medical Home Characteristics and the Pediatric Patient Experience

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Abstract

Background—The patient-centered medical home (PCMH) has roots in pediatrics, yet we know little about the experience of pediatric patients in PCMH settings.

Objective—To examine the association between clinic PCMH characteristics and pediatric patient experience as reported by parents.

Research Design—We assessed the cross-sectional correlation between clinic PCMH characteristics and pediatric patient experience in 24 clinics randomly selected from the Safety Net Medical Home Initiative, a 5-state PCMH demonstration project. PCMH characteristics were measured with surveys of randomly selected providers and staff; surveys generated 0 (worst) to 100 (best) scores for five subscales, and a total score. Patient experience was measured through surveying parents of pediatric patients. Questions from the Consumer Assessment of Healthcare Providers and Systems Clinician & Group (CAHPS-CG) instrument produced 4 patient experience measures: timeliness, physician communication, staff helpfulness, and overall rating. To investigate the relationship between PCMH characteristics and patient experience, we used generalized estimating equations with an exchangeable correlation structure.

Results—We included 440 parents and 214 providers and staff in the analysis. Total PCMH score was not associated with parents' assessment of patient experience; however, PCMH subscales were associated with patient experience in different directions. In particular, quality improvement activities undertaken by clinics were strongly associated with positive ratings of patient experience, while patient care management activities were associated with more negative reports of patient experience.

Conclusions—Future work should bolster features of the PCMH that work well for patients while investigating which PCMH features negatively impact patient experience, to yield a better patient experience overall.

Keywords

patient-centered medical home; patient experience; pediatric

INTRODUCTION

The patient-centered medical home (PCMH) aims to provide accessible, coordinated, and patient-centered care with goals of improving the quality of care, reducing costs, and improving patient experience.^{1,2} First described in the late 1960's for children with special health care needs,³⁻⁵ the PCMH model has expanded to include easy access for patients, coordination among providers, effective communication with patients, timely tracking of patient data, proactive care management, and quality improvement for all patients. Despite the model's pediatric roots, we still know very little about the experience of pediatric patients and their families in a PCMH. Patient experience measures provide direct reports from patients on what occurs during the course of seeking care and commonly assess patient satisfaction. Health care providers, administrators, and policymakers are increasingly recognizing the importance of improving patient experience – both as an intrinsically important aspect of caring for patients and as a potential contributor to improved health care quality and outcomes.⁶ Measures of patient experience, such as the Consumer Assessment of Healthcare Providers and Systems – Clinician and Group survey (CAHPS-CG), are also beginning to be used to adjust payments to primary care providers.⁷ One previous study by Cooley and colleagues examined the experience of pediatric patients with chronic conditions

in 43 practices in five states but found no correlation of pediatric patient experience with PCMH attributes.⁸

As part of a larger PCMH study,⁹⁻¹¹ this report examines the association between PCMH characteristics and pediatric patient experience in the safety net setting, as reported by parents. Our study expands on the existing literature in three important ways. First, we examine patient experience outcomes using the CAHPS-CG, a widely used experience measure validated in pediatric populations.¹² Second, we focus on the experience of a general population of pediatric patients and their families; we did not focus on a specific disease condition. Finally, we study safety net primary care clinics, a critically important setting in which to understand the effects of the medical home. Safety net clinics provide primary care for patients who are largely racial and ethnic minorities and of low income.¹³⁻¹⁵ Safety net health center leaders are looking to the PCMH as a model that can facilitate improvements in processes and outcomes of patient care, with studies underway supported by Centers for Medicare & Medicaid Services and Health Resources and Services Administration.^{16,17} By providing timely information about the relationship between the PCMH and patient experience, we hope to inform these efforts and provide insights into whether the PCMH appears to be having an impact on patient experience and which aspects of the model appear to be most strongly associated.

METHODS

Twenty-four health centers (HCs) were randomly selected from the 65 HCs participating in the Commonwealth Fund-supported Safety Net Medical Home Initiative (SNMHI), a 4-year intervention to implement and evaluate the medical home in safety net clinics. Qualis Health and the MacColl Center for Health Care Innovation at the Group Health Research Institute led the implementation of the medical home model in this Initiative using eight “change concepts” for practice transformation that are based on medical home principles and tailored to the safety net setting.¹⁸ We assessed the cross-sectional correlation between clinic PCMH characteristics and parents’ ratings of their children's health care in 24 safety net clinics across 5 states (5 clinics each from Colorado, Idaho, Massachusetts, and Oregon, and 4 from Pennsylvania).

PCMH CHARACTERISTICS

PCMH characteristics of the health centers were assessed to create a total PCMH score, the key independent variable. PCMH characteristics were measured via self-administered surveys¹⁰ mailed to 271 randomly selected health care providers and staff from the 24 clinics between January and June 2010, early-on in the larger PCMH intervention (intervention months 8-13). Providers included physicians, nurse practitioners and physician assistants. Staff included behavioral health specialists, educators, certified medical assistants, counselors, dietitians, nurses (licensed practical nurses and registered nurses), psychiatrists, psychologists and social workers. Detailed description of provider and staff survey administration has been previously published.¹⁰

The PCMH survey produced 0 (worst) to 100 (best) scores for a total PCMH score and five PCMH subscales: access and communication with patients, communication with other

providers, tracking data, care management, and quality improvement. The “access and communication with patients” subscale assessed whether patients can contact and see their clinician on a timely basis and whether interpreter services are available when necessary. The “communication with other providers” subscale assessed each clinic's ability to exchange information with specialists, hospitals, and emergency departments. The “tracking data” subscale assessed the ability of providers and staff to identify patients with a particular disease, monitor test results, and follow-up. The “care management” subscale assessed the ability to individualize services for patients, coordinate care among providers within each clinic, and support patient self-management, utilizing community resources when necessary. The “quality improvement” subscale assessed the ability to systematically collect measures of clinician and practice performance and use these to improve care.

The total PCMH score was calculated as the mean of the 5 PCMH subscale scores. The communication with other providers subscale score was based only on provider responses, since that section was excluded from the staff survey. In statistical analyses, provider and staff PCMH scores were averaged for each of the 24 clinics.

PATIENT EXPERIENCE

Pediatric patient experience, the key dependent variable, was measured via self-administered surveys mailed to randomly selected parents or guardians (hereafter referred to as “parents”) of 70 pediatric patients from each participating clinic seen during the three months prior to the survey. Surveys were completed between June 2010 and November 2011 (intervention months 13-30). We increased one clinic's sample size to 111 patients because the clinic anticipated low response rates from a large refugee patient population. Surveys were translated into the patient's preferred language (Spanish or Portuguese) as reported by the clinics. Initial mailings included a one-time incentive of \$2, and up to 3 more rounds of follow-up surveys were sent to individuals who did not respond. The survey included questions from the child version of the Consumer Assessment of Healthcare Providers and Systems Clinician & Group (CAHPS-CG).¹⁹ The CAHPS-CG instrument produces four measures of patient experience expressed in 0-100 scores: timeliness, physician communication, staff helpfulness, and overall provider rating.

COVARIATES

We included covariates demonstrated in the literature to be associated with patient assessments of the quality of their care.²⁰ Patient-level covariates were child age group, sex, race or ethnicity, type of insurance, number of clinic visits in the last 12 months, duration of relationship with provider, parents' report of the child's health status, parent age group, and parent education level. Clinic-level covariates were number of full-time equivalent (FTE) providers (used as a proxy for clinic size), and the state in which the clinic is located.

STATISTICAL ANALYSIS

To investigate the relationship between PCMH characteristics and patient experience, we fit bivariate and multivariate models using generalized estimating equations with an exchangeable correlation structure to account for clustering effect within clinic. We excluded respondents with missing covariate data from analysis. In multivariate analyses,

patient experience was modeled in two ways, once as a function of total PCMH score and covariates, and again as a function of the five PCMH subscales and covariates in one model. To interpret the impact of higher PCMH scores, we display the effects of a 10-point higher PCMH score on patient experience. To illustrate a 10-point difference in PCMH score, consider a scenario that compares two hypothetical clinics, clinic A and clinic B. In response to “my patients see me rather than some other provider when they come for a routine visit” clinic A strongly agrees whereas clinic B strongly disagrees; and second, in response to “how often is it difficult to communicate with outside specialists”, clinic A reports “rarely” and clinic B reports “almost always”. The combined differences in responses from these two survey questions would yield a 10-point higher total PCMH score for clinic A compared with clinic B.

To examine potential differences between providers and clinical staff and how they may perceive various PCMH features, we also conducted secondary analyses to examine 1) ratings of PCMH characteristics separated by role, 2) association between patient experience and PCMH rating as assessed by providers, and 3) association between patient experience and PCMH rating as assessed by staff.

RESULTS

Providers, Staff, and Patient-Centered Medical Home Scores

Of the 271 providers and staff surveyed at the 24 study clinics, we received 214 (79.0%) responses (Table 1) with an average of 8.9 provider and staff responses per clinic. Provider and staff response rates to the survey did not differ significantly. Providers and staff were mostly female (74.8%) and non-Hispanic white (73.8%), with an average of 13.7 years since the end of their clinical training and 6.4 years of working at the study clinic. Of the 24 clinics represented, 16 (66.7%) were designated as Federally Qualified Health Centers (FQHCs), 11 (45.8%) were located in a city or suburban setting, 9 (37.5%) had more than 8 provider FTEs, and 17 (70.8%) had electronic medical record systems functioning at the time of the study. Mean total PCMH score was 62.9 (standard deviation, SD=7.0). Table 2 provides the distribution of survey responses used to construct the PCMH subscale scores and PCMH total score. PCMH subscale scores ranged from a low of 60.7 (SD=10.5) for access and communication with patients to a high of 64.7 (SD=8.7) for care management.

Patient Characteristics

Of the 1,721 surveys sent to parents of pediatric patients, 93 were returned-to-sender as undeliverable, and we ultimately received 535 responses, reflecting a 32.9% response rate. After excluding respondents with missing covariate data, we included 440 parent respondents in the analysis. Characteristics of the pediatric study sample are shown in Table 3. The majority of pediatric patients were non-Hispanic white (53.0%), male (54.8%), and insured via Medicaid (64.3%). Respondents predominantly reported their child's health was either excellent (44.8%) or very good (37.0%) and that their child had visited his or her provider 3 or more times in the last 12 months (63.9%).

Patient Experience

On a 0-100 scale, the mean ratings of patient experience were 86.3 (SD=19.0) for physician communication, 82.6 (SD=20.4) for overall rating of provider, 79.2 (SD=24.4) for helpful office staff, and 67.5 (SD=22.5) for timeliness (Table 4). Fifty-seven percent of respondents gave their child's provider an overall rating of 9 or 10 (highest) on a 10-point scale.

Multivariate Correlation of Medical Home Capability and Patient Experience

In multivariate analyses (Table 5), total PCMH score was not associated with any patient experience outcome. PCMH subscale ratings, however, showed several significant correlations with patient experience. A 10-point higher PCMH subscale score for quality improvement (QI) was associated with higher patient experience ratings of timeliness (10.3, 95% confidence interval, CI 7.2, 13.3), physician communication (5.5, 95% CI 1.8, 9.2), helpful office staff (5.4, 95% CI 1.5, 9.3) and overall provider rating (7.8, 95% CI 3.4, 12.2). A 10-point higher PCMH subscale score for tracking data was also positively associated with patient experience ratings: timeliness (2.6, 95% CI 0.9, 4.2), physician communication (1.4, 95% CI 0.1, 2.7), and helpful office staff (2.3, 95% CI 0.005, 4.6). The PCMH subscale score for care management was negatively correlated with patient experience ratings, with a 10-point higher care management score associated with lower ratings of timeliness (-9.1, 95% CI -12.2, -6.0), physician communication (-5.6, 95% CI -9.1, -2.0), helpful office staff (-8.4, 95% CI -12.7, -4.1) and overall provider rating (-5.5, 95% CI -10.1, -0.9). A 10-point higher PCMH subscale score for access and communication with patients was negatively associated with patient ratings of timeliness (-3.5, 95% CI -5.7, -1.3). In secondary analyses we examined provider and staff PCMH responses separately. We found no association between total PCMH score and patient experience; however, some PCMH subscale ratings by providers and staff demonstrated associations with various aspects of patient experience (see Appendix Tables 1-3).

DISCUSSION

The patient-centered medical home is a challenging and complex intervention to improve primary care. Identifying key aspects of the PCMH that significantly affect patient experience can help us better prioritize and improve the various activities that comprise the model. In this study, we found that a measure of overall PCMH characteristics was not associated with pediatric patient experience; however, individual subscales of the PCMH were significantly associated with experience ratings in differing directions. In particular, the PCMH subscale for quality improvement was strongly positively associated with patient experience and the PCMH subscale for care management was negatively associated with patient experience.

Our quality improvement PCMH subscale asks providers and staff whether their clinic has structures and processes in place to assess and improve quality of care. Patient experience is a common focus of quality improvement activities²¹ and our quality improvement subscale (Table 2) specifically asks providers and staff about their clinic's willingness to change in response to feedback. It may be the case that provider and staff who incorporate quality improvement approaches into their regular workflow are more attuned to meeting patient

expectations and improving patient experience in a variety of ways, making quality improvement an important strategy for improving patient experience through the PCMH.

In contrast, higher provider and staff ratings of care management were associated with more negative patient experience ratings. This finding is surprising, and suggests the need for further study. Our care management subscale has several questions that focus on care for patients at high risk for poor outcomes and patients with chronic illness. Our sample included approximately 20% pediatric patients with fair or poor health and these patients may have had particularly strong needs for care management support. It may be that in the setting of constrained resources, staff time and effort devoted to care management for a minority of patients with greater health needs detracts from staffs' ability to provide a positive patient experience for the broader patient population overall. Some studies have documented improved outcomes for pediatric patients with specific medical conditions (asthma, sickle cell disease) in clinical settings with certain PCMH features;^{22,23} however, no other studies have documented effects of care management on overall patient experience for a general pediatrics population in the context of the PCMH. Our finding regarding care management suggests providers and staff may need improved strategies to identify and communicate proactively with families experiencing significant care burdens related to chronic illness, while streamlining care and communications for healthy patients. Such strategies may lead to improved patient experience overall.

Limitations

Our study has several limitations. First, as this is a cross-sectional analysis of clinics at baseline of a PCMH intervention, we are able to demonstrate association but not establish causality between PCMH characteristics and patient experience. In future work, it will be important to examine how patient experience changes over time with improvements to a clinic's PCMH capabilities. Second, we cannot determine when clinics implemented PCMH characteristics, and whether there was sufficient time for those changes to have an effect on patient experience. Provider and staff PCMH score was assessed over months 8 to 13 of the four-year intervention, while patient experience was assessed over months 13 to 30, with the clinics varying in specific survey start and end dates within those timeframes. These timings may have resulted in some temporal mismatch in our measures. Third, we were not able to limit our survey sample exclusively to pediatric providers. Provider and staff respondents to the PCMH characteristics survey were sampled from all providers and staff practicing at least half time at a clinic. Many providers in community health centers work with both children and adults, including family practice physicians (the most common primary care physicians in HCs) and clinical staff.²⁴ Fourth, we cannot generalize our findings to all safety net clinics. Clinics that chose to participate in the overall study may have had higher motivation and a different trajectory for implementing PCMH characteristics than safety net practices at large. Fifth, while our response rates of 78.2% for providers and staff and 32.9% for parents are reasonable for the populations surveyed, response bias is possible and we had limited ability to compare respondents to non-respondents. Finally, the survey instruments used in this study to assess medical home characteristics (as reported by providers and staff) and patient experience may not adequately capture some aspects of the PCMH and experience. While our PCMH measure covers a more comprehensive scope of activities than

many PCMH studies, it still may lack elements that some believe to be important to the PCMH. For example, the survey does not include questions on team-based care or shared decision-making. Measures of the PCMH and patient experience should continue to evolve to incorporate the most salient features of patient-centered care.

Implications

This study on pediatric patient experience in the safety net setting has important implications. First, incorporating regular quality improvement activities and culture into safety net clinics can be a powerful tool for improving patient experience. Second, care management, especially important for patients with chronic disease, needs to be implemented in ways that minimally disrupt overall patient experience in safety net settings. Some studies of adult patients have revealed ways in which efforts to achieve key PCMH aims can result in unintended consequences. For example, one PCMH practice implemented a symptom-based questionnaire for patients administered by medical assistants before the clinician interaction in an effort to increase efficiency during the patient's visit; however, the use of the questionnaire correlated with worse patient satisfaction measures.²⁵ The PCMH aims to improve multiple aspects of care, including access, quality, coordination, and continuity. We need to bolster characteristics of PCMH which are working well for patients while recognizing that some improvement efforts may negatively affect other aspects of patients' experience, in order to optimize the model overall.

To provide care that results in a positive patient experience, patient feedback should be routinely incorporated into the design, implementation, and continued improvement efforts surrounding the PCMH. Features of the PCMH that contribute to negative patient experience should be revamped with ample input from patients. Safety net health care settings such as FQHCs provide a promising setting for incorporating reports of patient experience, as governance requirements stipulate that each FQHC board must include a majority of active, registered clients of the health center, representative of the population served.²⁶ For key components of the PCMH to be effective and to achieve the patient-centered mission of the medical home model, future strategies should regularly incorporate patients' perspectives to realize the full promise of the PCMH model, which originated in pediatrics to provide comprehensive, coordinated care for all.²⁷

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Appendix

Appendix Table 1

Responses of PCMH characteristics by roles

PCMH scores from provider and staff survey	Individual responses			Clinic-aggregated responses (n=24)			
	Provider (n=105)	Staff (n=109)	p-value	Provider	Staff	p-value ¹	p-value ²
Access and communication with patients	60.3 (12.1)	57.9 (18.6)	0.260	60.9 (10.3)	61.4 (15.5)	0.887	0.875
Communication with other providers	65.3 (22.8)	n/a	n/a	64.5 (13.9)	n/a	n/a	n/a
Tracking data	58.0 (24.9)	68.0 (19.1)	0.001	57.0 (17.3)	66.3 (17.0)	0.066	0.051
Care management	59.1 (16.7)	69.7 (15.5)	<.001	59.0 (12.4)	71.1 (11.2)	0.001	<.001
Quality improvement	62.0 (14.2)	62.2 (16.1)	0.923	61.8 (11.1)	64.9 (11.7)	0.357	0.342
Total	60.8 (11.4)	64.1 (13.5)	0.062	60.4 (7.3)	65.5 (10.6)	0.059	0.047

¹ Provider and staff responses were compared as two independent samples (student t-test)

² Provider and staff responses were compared as dependent samples (paired t-test by clinic)

Appendix Table 2

Association between patient experience and PCMH rating as assessed by providers Effect of a 10-point increase in provider-rated PCMH score on patient experience

Estimate (95% confident interval)		Patient experience from patient survey			
		Getting timely appointments, care, and information	How well doctors communicate with patients	Helpful, courteous, and respectful office staff	Overall rating
PCMH scores from provider survey	Total PCMH score	-0.8 (-5.3,3.6)	-0.9 (-3.7,1.9)	-3 (-7.6,1.6)	-0.2 (-5.4,5)
	PCMH subscale scores				
	Access and communication with patients	1.7 (-1.3,4.6)	-0.7 (-2.9,1.6)	-0.6 (-2.6,1.4)	2.7 (0,5.4) [*]
	Communication with other providers	-0.4 (-2.3,1.4)	-0.2 (-1.8,1.3)	0.9 (-0.6,2.5)	-0.5 (-2.6,1.7)
	Tracking data	2.7 (1.4,3.9) ^{***}	0.2 (-0.7,1.2)	2.1 (1.3,2.9) ^{***}	1.3 (0,2.5) [*]
	Care management	-2.5 (-4.8,-0.3) [*]	-1.9 (-4.2,0.3) ⁺	-2.6 (-5.4,0.2) ⁺	-1.4 (-5.5,2.8)
	Quality improvement	-1.2 (-4.8,2.4)	1.6 (-1.5,4.7)	-1.7 (-4.9,1.4)	-1.4 (-5.5,2.8)

**Denotes statistically significant difference from zero at p<0.01.

⁺ Denotes statistically significant difference from zero at p<0.1.

^{*} Denotes statistically significant difference from zero at p<0.05.

^{***} Denotes statistically significant difference from zero at p<0.001.

Appendix Table 3

Association between patient experience and PCMH rating as assessed by staff Effect of 10-point increase in staff-rated PCMH score on patient experience

Estimate (95% confident interval)		Patient experience from patient survey			
		Getting timely appointments, care, and information	How well doctors communicate with patients	Helpful, courteous, and respectful office staff	Overall rating
PCMH scores from staff survey	Total PCMH score	-0.3 (-3.1,2.4)	0.9 (-0.8,2.5)	1.2 (-1.2,3.6)	1.8(-1.6,5.2)
	PCMH subscale scores				
	Access and communication with patients	-0.8 (-2.6,1)	0.7 (-1,2.4)	1.5 (-0.1,3.1) ⁺	-0.3(-2.4,1.7)
	Tracking data	0.9 (-1.4,3.2)	1.4 (-0.1,3) ⁺	2 (0.7,3.4) ^{**}	0.9(-1.2,3.1)
	Care management	-5 (-12.7,2.6)	-2.9 (-8.6,2.8)	-8 (-12.7,-3.3) ^{***}	-1.8(-9.6,5.9)
	Quality improvement	4.6 (-0.6,9.8) ⁺	1.7 (-1.5,4.9)	5.2 (2.3,8.1) ^{***}	3.4(-1.1,7.9)

*Denotes statistically significant difference from zero at p<0.05.

⁺Denotes statistically significant difference from zero at p<0.1.

** Denotes statistically significant difference from zero at p<0.01.

*** Denotes statistically significant difference from zero at p<0.001.

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Table 1

Characteristics of Responding Providers and Staff, and Their Clinics

PROVIDERS AND STAFF (N=214)	Number of respondents	Percent of respondents^c
Role		
Physicians	60	28.0
Nurse practitioner or physician assistant	45	21.0
Registered nurse	33	15.4
Certified medical assistant or licensed practical nurse	54	25.2
Other ^a	22	10.3
Sex		
Male	52	24.3
Female	160	74.8
Race or ethnicity		
White, non-Hispanic	158	73.8
Hispanic	33	15.4
Black, non-Hispanic	10	4.7
Multi or other, non-Hispanic	10	4.7

CLINICS (N=24)	Number of respondents	Percent of respondents
More than 8 provider full-time equivalents	9	37.5

	Mean	Standard deviation
Total patient-centered medical home score ^b	62.9	7.0
Patient-centered medical home subscale scores ^b		
Access and communication with patients	60.7	10.5
Communication with other providers	64.5	13.9
Tracking data	62.2	11.9
Care management	64.7	8.7
Quality improvement	62.5	7.6

^aIncludes administrator, behavioral health specialist, dentist, diabetes educator, dietician, health educator, medical records staff, social worker and others.

^bPatient-centered medical home total and subscale scores are from a 0-100 scale created by the authors and based on survey responses of providers and staff at each clinic (see reference 12).

^cPercentages may not sum to 100 because of missing values and rounding.

TABLE 2

Provider and Staff Responses to PCMH Questions^a

Question ^b	% of Respondents ^c				
Access and Communication With Patients Subscale					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Patients see me rather than some other provider when they come in for					
A routine visit	1.9	4.7	8.5	53.5	31.5
An urgent care visit	3.3	31.0	33.3	26.8	5.6
Same day appointment with me or another provider	1.4	10.8	17.4	42.7	27.7
Difficult to spend enough time with patients	2.8	29.7	18.9	34.4	14.2
Adequate access to interpreters	9.6	26.4	21.2	26.0	16.8
Communication With Other Providers Subscale					
	Rarely	Occasionally	Sometimes	Frequently	Almost Always
How often is it difficult for you to communicate about your patients with					
Outside specialists ^d	13.7	26.5	36.3	21.6	2.0
Hospital-based providers ^d	24.8	28.7	30.7	12.9	3.0
Emergency departments ^d	45.0	21.0	23.0	8.0	3.0
Tracking Data Subscale					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Easily identify patients with particular disease	3.8	16.7	18.6	49.0	11.9
Good systems to track test results and follow up	3.3	17.4	15.5	46.9	16.9
Care Management Subscale					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Identifying patients at high risk for poor outcomes	4.8	23.3	27.6	36.2	8.1
Intensifies services for patients at high risk for poor outcomes	2.9	15.8	23.9	45.9	11.5
Our clinic individualizes services to different patients with different needs	1.4	6.6	14.2	54.0	23.7
Effective in helping patients self-manage chronic illness	1.4	13.3	23.3	53.3	8.6
Coordinated care among clinic staff	0.5	11.0	14.3	51.4	22.9
Utilizes community resources to meet needs	0.9	7.1	16.0	51.9	24.1
EMR provides prompts at time of the patient visit ^e	10.6	23.8	19.9	36.4	9.3
Quality Improvement Subscale					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Structure promotes giving high-quality care	0.9	7.0	13.1	55.9	23.0

Quality Improvement Subscale					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Actively improving patient safety	0.5	0.9	8.0	62.7	27.8
Studies patients' complaints	0.9	11.7	24.4	45.5	17.4
Serious effort to figure out problem in clinic	1.4	9.0	17.9	51.4	20.3
Reports on the quality of care to patients	10.5	31.0	26.2	24.8	7.6
Practice willing to change how to do things	3.3	7.5	22.1	54.9	12.2
Adequate release time from regular job duties for QI	7.6	27.5	29.9	28.0	7.1
I am rewarded for QI work	15.9	28.2	34.4	15.9	5.6

Abbreviations: EMR, electronic medical record; PCMH, patient-centered medical home.

^aThe survey questions were mapped to the domains of the 2008 National Committee for Quality Assurance PCMH standards and were then consolidated into 5 subscales based on content validity.

^bThe exact wording of some survey questions was changed slightly for brevity.

^cDue to rounding, data do not sum to 100%.

^dIncluded only responses from providers.

^eIncluded only responses from clinics that have EMRs.

Table 3

Characteristics of Pediatric Patients and Their Parent Respondents (n=440)

Characteristics	Number of respondents	Percent of respondents ^a
Patient age group, years		
1	90	20.5
2-3	74	16.8
4-7	75	17.0
8-12	92	20.9
13-17	109	24.8
Patient sex		
Male	241	54.8
Female	199	45.2
Patient race/ethnicity		
Non-Hispanic white	233	53.0
Non-Hispanic black	43	9.8
Hispanic	132	30.0
Non-Hispanic other or multiple race	32	7.3
Patient insurance status		
Medicaid	283	64.3
Private	107	24.3
Other or multiple insurance	21	4.8
Uninsured	29	6.6
Patient health status		
Excellent	197	44.8
Very good	163	37.0
Good	60	13.6
Fair or poor	20	4.5
Frequency of visits in the last 12 months		
Less than 3 visits	159	36.1
3 or more visits	281	63.9
Duration of the relationship with provider		
Less than 3 years	274	62.3
3 or more years	166	37.7
Respondent age group, years		
18-24	47	10.7
25-34	172	39.1
35-44	127	28.9
45-54	70	15.9
55 and over	24	5.4

Characteristics	Number of respondents	Percent of respondents ^a
Respondent education level		
Less than high school	94	21.4
High school graduate or GED	116	26.4
Some college or 2-year degree	137	31.1
4-year college graduate or higher	93	21.1

Abbreviation: GED, General Educational Development Certificate.

^aPercentages may not sum to 100 because of missing values and rounding.

Table 4

Distribution of Survey Responses for Patient Experience Assessed by CAHPS-CG Survey

Composite scores	Survey item	Percent of Respondents ^a					
		Never	Almost never	Sometimes	Usually	Almost always	Always
Getting timely appointments, care, and information (Mean=67.5 SD=22.5)	Got appointment for urgent care as soon as needed (n=306 ^b)	2.3	5.6	14.4	11.4	27.1	39.2
	Got appointment for non-urgent care as soon as needed (n=370)	1.4	2.2	13.8	14.6	19.2	48.9
	Got answer to medical question the same day he/she phoned doctor's office (n=243)	4.1	6.6	11.9	11.9	25.1	40.3
	Got answer when phoned doctor's office after hours (n=99)	5.1	4.0	15.2	14.1	17.2	44.4
	Saw doctor within 15 minutes of appointment time (n=436)	12.8	10.6	27.8	18.8	15.8	14.2
How well doctors communicate with patients (Mean=86.3 SD=19.0)	Explained things in a way that was easy to understand (n=439)	1.1	1.1	5.2	9.6	16.4	66.5
	Listened carefully to patient (n=437)	0.5	1.4	5.3	9.8	12.8	70.3
	Easy to understand instructions about taking care of health problems (n=356)	0.6	2.2	5.6	7.9	21.1	62.6
	Knew important information about patient's medical history (n=437)	1.6	4.3	6.2	11.2	24.3	52.4
	Respected patient's comments (n=439)	0.5	1.4	5.5	6.8	11.2	74.7
	Spent enough time with the patient (n=437)	1.4	2.5	8.7	9.6	19.0	58.8
Helpful, courteous, and respectful office staff (Mean=79.2 SD=24.4)	Clerks and receptionists were helpful (n=440)	1.8	4.3	13.2	16.1	23.0	41.6
	Clerks and receptionists were courteous and respectful (n=438)	1.4	2.7	8.7	12.3	18.0	56.8
		1-4	5-6	7	8	9	10
Overall rating (Mean=82.6 SD=20.4)	Rating doctor from 1 (worst) to 10 (best) (n=438)	4.3	8.2	8.2	22.1	18.7	38.4

Abbreviation: CAHPS-CG, Consumer Assessment of Healthcare Providers and Systems Clinician & Group; SD, standard deviation.

^a Percentages may not sum to 100 because of missing values and rounding.^b Sample size "n" for each item did not include missing responses to the survey question or "not applicable" responses (e.g. "I did not phone the doctor's office after office hours").

Table 5

Multivariate Analysis: Effect of a 10-point Increase in PCMH score^a on Patient Experience^b

Estimate ^{c,d} (95% confident interval)		Patient experience composite scores from patient survey ^b			
		Getting timely appointments, care, and information	How well doctors communicate with patients	Helpful, courteous, and respectful office staff	Overall rating
PCMH scores from provider and staff survey ^a	Total PCMH score	0.3 (-5.2,4.7)	0.3 (-2.8,3.3)	-0.5 (-5.6,4.5)	2.6 (-3.4,8.6)
	PCMH subscale scores				
	Access and communication with patients	-3.5 (-5.7,-1.3) **	-0.9 (-3.8,2.0)	-0.3 (-2.9,2.2)	-0.5 (-3.2,2.3)
	Communication with other providers	-0.4 (-1.8,1.1)	0.02 (-1.2,1.2)	1.0 (-0.4,2.4)	-0.6 (-2.1,0.9)
	Tracking data	2.6 (0.9,4.2) **	1.4 (0.1,2.7) *	2.3 (0.005,4.6) *	1.3 (-0.2,2.8) ⁺
	Care management	-9.1 (-12.2,-6.0) ***	-5.6 (-9.1,-2.0) **	-8.4 (-12.7,-4.1) ***	-5.5 (-10.1,-0.9) *
	Quality improvement	10.3 (7.2,13.3) ***	5.5 (1.8,9.2) **	5.4 (1.5,9.3) **	7.8 (3.4,12.2) ***

Abbreviation: PCMH, Patient-Centered Medical Home.

^aPCMH total and subscale scores are from a 0-100 scale created by the authors and based on survey responses of providers and staff at each clinic (see reference 12).

^bPatient experience is scored on a 0-100 (0 least, 100 most) scale and assessed by the Consumer Assessment of Healthcare Providers and Systems Clinician & Group (CAHPS-CG) Survey.

^cEstimate (95% confidence interval) is reported from multivariate generalized estimating equation models with the clinic clustering effect. The estimate indicates how much a 10-point increase in total PCMH score or PCMH subscale score would increase the patient experience.

^dPatient experience is modeled in two ways, once as a function of total PCMH score and covariates, and again as a function of the five PCMH subscales and covariates. Covariates were child age group, sex, race or ethnicity, type of insurance, number of clinic visits in the last 12 months, duration of relationship with provider, parents' report of the child's health status, parent age group, parent education level, clinic full-time equivalent providers and the state in which the clinic is located.

⁺ Denotes statistically significant difference from zero at p<0.1.

*

Denotes statistically significant difference from zero at p<0.05.

**

Denotes statistically significant difference from zero at p<0.01.

Denotes statistically significant difference from zero at p<0.001.