Title

Evaluating the Psychometric Properties of the CAHPS Patient-Centered Medical Home Survey

Journal

Clinical Therapeutics, 36(5)

Author

Hays, Ron Dale

Publication Date

2014-05-01

Peer reviewed

Original Research

Evaluating the Psychometric Properties of the CAHPS Patient-Centered Medical Home Survey

Ron D. Hays, PhD[1]; Laura J. Berman, MPH[2]; Michael H. Kanter, MD[3]; Mildred Hugh, MA, MPH[2]; Rachel R. Oglesby, MPH[4]; Chong Y. Kim, PhD[2]; Mike Cui, MPH[5]; and Julie Brown, BA[5]

[1]UCLA Division of General Internal Medicine and Health Services Research, Los Angeles, California; [2]Regulatory Relations and Performance Assessment, Southern California Permanente Medical Group, Kaiser Permanente, Pasadena, California; [3]Southern California Permanente Medical Group, Kaiser Permanente, Pasadena, California; [4]Market Research, Kaiser Permanente Northwest, Portland, Oregon; and [5]RAND, Santa Monica, California

ABSTRACT

Objective: The goal of this study was to evaluate the reliability and validity of the Consumer Assessment of Healthcare Providers and Systems (CAHPS) Patient-Centered Medical Home (PCMH) survey.

Methods: We conducted a field test of the CAHPS PCMH survey with 2740 adults. We collected information by mail (n = 1746), telephone (n = 672), and from the Web (n = 322) from 6 sites of care affiliated with a West Coast staff model health maintenance organization.

Results: An overall response rate of 37% was obtained. Internal consistency reliability estimates for 7 multi-item scales were as follows: access to care, 5 items, α = 0.79; communication with providers, 6 items, α = 0.93; office staff courtesy and respect, 2 items, α = 0.80; shared decision making about medicines, 3 items, α = 0.67; self-management support, 2 items, α = 0.61; attention to mental health issues, 3 items, α = 0.80; and care coordination, 4 items, α = 0.58. The number of responses needed to get reliable information at the site of care level for the composites was generally acceptable (<300 for 0.70 reliability-level) except for self-management support and shared decision making about medicines. Item-scale correlations provided support for distinct composites except for access to care and shared decision making about medicines, which overlapped with the communication with providers scale. Shared decision making and self-management support were significantly, uniquely associated with the global rating of the provider (dependent variable), along with access and communication in a multiple regression model.

Conclusions: This study provides further support for the reliability and validity of the CAHPS PCMH survey, but refinement of the self-management support and shared decision-making scales is needed. The survey can be used to provide information about the performance of different health plans on multiple domains of health care, but future efforts to improve some of the survey items is needed. (*Clin Ther.* 2014;36:689–696)

Key word: CAHPS PCMH survey, patient-centered care, patient experience measure, evaluations of health care, health plan survey.

INTRODUCTION

Patient-centered medical homes are emerging as an integral part of the delivery of health care in the United States.[1] The Consumer Assessment of

Accepted for publication April 9, 2014.
http://dx.doi.org/10.1016/j.clinthera.2014.04.004
0149-2918/$ - see front matter

Healthcare Providers and Systems (CAHPS) Patient-Centered Medical Home (PCMH) survey was developed to enable evaluation of patient care experiences in sites of care at different stages of implementation of the medical home model of care delivery (from sites considering adoption of some features of the medical home model to fully recognized medical homes).

Scholle et al[2] reported results that provide initial support for the reliability and validity of the survey, but this study was based on an East Coast sample only and a 25% response rate to the survey. The objective of the present study was to conduct an independent assessment of the reliability and validity of the CAHPS PCMH survey, including an evaluation of the hypothesized multi-item scales. We use data collected from members of a health maintenance organization located on the West Coast of the United States.

MATERIALS AND METHODS

The CAHPS PCMH survey includes the CAHPS clinician and group survey core measures of access to care, communication with providers, and office staff courtesy and respect.[3,4] The PCMH survey also includes a 3-item shared decision making about medicines scale, a 2-item self-management support scale, and a 3-item behavioral/whole person (attention to mental health issues) scale. Two separate items were recommended to assess care coordination (got test results, and provider informed and up-to-to-date about care from specialists) because analyses did not support a multi-item scale. Subsequently, a 5-item care coordination scale was developed based on analysis of the CAHPS Medicare survey.[5] The patient experience measures in the CAHPS PCMH survey are summarized in the **Supplemental Appendix** (available in the online version at http://dx.doi.org/10.1016/j.clinthera.2014.04.004)." The survey also includes questions assessing patient demographic characteristics (sex, age, race/ethnicity, and education) and self-rated health.

We conducted a field test with adults aged ≥18 years from 6 sites of care affiliated with a staff model health maintenance organization (ie, care is provided in a facility owned by the organization and the organization employs the providers of care, with a high degree of control over care delivered) located on the West Coast. Two of the sites were located in the north and the other 4 in the south on the West Coast. The 2 northern facilities achieved PCMH recognition in 2012; 2 of the 4 southern facilities obtained PCMH recognition in 2009 and 2010. The other 2 facilities did not have PCMH recognition but had some inherent similarities in medical practices.

The study included a random selection of adult members (aged ≥18 years) with ≥1 visit to a primary care provider in the previous 12 months. Members who had completed any patient experience survey within the previous 3 months (northern facilities) or previous 6 months (southern facilities) were excluded from the present study.

Two different data collection approaches were used (**Table I**). A Web–mail protocol was used for 2000 members with e-mail addresses in the north. Data collection was begun by Web contact (3 e-mail invitations); after 4 weeks, nonrespondents were sent the survey by mail. Both English- and Spanish-language CAHPS surveys were administered, depending on language preference. The second approach was a mail-phone protocol. A sample of 1714 members with email addresses in the north were selected for this protocol Data collection was begun by mail (2 mailings); after 4 weeks, nonrespondents were called for a telephone interview. The mail–telephone protocol was used for 1714 members in the south with an English-language preference. This protocol was also used for 2093 members in the south with a Spanish-language preference.

Table I. Summary of study design.

Web–Mail	Mail–Telephone	Mail–Telephone	Mail–Telephone	Overall
North	North	South	South	—
English language	English language	English language	Spanish language	—
2000 sampled	1714 sampled	1714 sampled	2093 sampled	7432 sampled
774 respondents	946 respondents	828 respondents	192 respondents	2740 respondents
39% response rate	55% response rate	48% response rate	9% response rate	37% response rate

Paper and electronic study invitations were sent by the RAND Survey Research Group using the health plan's letter templates and leadership names/signatures. Participants were told that the survey would take <20 minutes on average to complete, and no financial compensation was offered for completion. All data collection was conducted by RAND; data collection began in September 2012 and ended in February of 2013.

Analysis Plan

We estimated internal consistency reliability[6] for 7 multi-item scales, unadjusted mean score differences, reliabilities, and intraclass correlations at the site level[7] for the 6 study locations, number of responses needed for target levels of reliability,[8] item-scale correlations for the scales, and correlations among the scales. Because the CAHPS PCMH survey is used to compare providers rather than patients, the site-level intraclass correlations are of utmost importance and are used to estimate the number of responses needed to obtain reliable information. The site-level reliabilities and intraclass correlations were estimated by partitioning between-site versus within-site variance in one-way ANOVAs.[9]

We also regressed the CAHPS 0 to 10 global rating of the provider (ie, 0 is worst possible provider and 10 is best possible provider) on the CAHPS scales, controlling for dummy variable indicators of age (18–24, 25–34, 35–44, 45–54, 55–64, or 65–74 years), education (8th grade or less, some high school, high school graduate, some college, or college graduate), self-rated general health (poor, fair, good, or very good), and self-rated mental health (poor, fair, good, or very good).

CAHPS items assess a variety of aspects of care and are only answered if they apply to a given respondent. Because of structured missing data, estimating correlations of items with scales using list-wise deletion of cases would be based on a small and unrepresentative subset of the sample. Hence, for the item-scale correlation matrix only, we imputed data for missing item responses by using other items in the matrix and a single Markov chain Monte Carlo imputation (maximum likelihood estimates of the covariance matrix by using an expectation–maximization algorithm). The median fraction of missing data was 0.03.

Analyses were conducted by using SAS version 9.2 (SAS Institute, Inc, Cary, North Carolina).

RESULTS

The overall study response rate was 37% (2740 completed surveys of 7432 eligible), with 1746 completed by mail, 672 by telephone, and 322 by Web access. Response rates varied from 9% for Spanish-language members in the south to 55% for English-language members in the north (mail–telephone protocol).

The majority of the 2740 respondents were female (62%), aged ≥55 years, and with some college education. Self-rated general health and mental health, respectively, was fair or poor for 17% and 12% of the sample (Table II).

Internal consistency reliability estimates for the 7 multi-item scales (overall sample and median estimate within the 6 sites) were as follows: access to care, 5 items, $\alpha = 0.79$, median, 0.83; communication with providers, 6 items, $\alpha = 0.93$, median, 0.92; office staff courtesy and respect, 2 items, $\alpha = 0.80$, median, 0.81; shared decision making about medicines, 3 items, $\alpha = 0.67$, median, 0.69; self-management support, 2 items, $\alpha = 0.61$, median, 0.62; attention to mental health issues, 3 items, $\alpha = 0.80$, median, 0.80; and care coordination, 4 items, $\alpha = 0.58$, median, 0.47.

Table III provides mean score differences (scales scored on 0–100 possible range, with a higher score representing a more positive experience with care) for the 6 sites participating in the study. The differences shown are relative to the site with the least positive score on each scale. There were no significant differences between sites on shared decision making and self-management support. Location 5 had the lowest scores (most negative experiences) on 4 of the scales, location 6 for 2 scales, and location 4 for 1 scale.

Estimated reliabilities and intraclass correlations, respectively, at the level of the 6 locations were as follows: access to care, 0.931 and 0.029; communication with providers, 0.783 and 0.008; office staff courtesy and respect, 0.873 and 0.015; shared decision making about medicines, 0.590 and 0.006; self-management support, 0.150 and <0.001; attention to mental health issues, 0.829 and 0.011; and care coordination, 0.872 and 0.015. The number of responses estimated to obtain reliabilities of 0.70, 0.80, and 0.90 per site are reported in Table IV. The number of responses for reliability of 0.70 ranged from 79 to 396, except for the self-management support scale, which had essentially no reliability at the site level.

Table II. Demographic characteristics of the sample (N = 2740).

Characteristic	No. (%)
Sex	
Female	1692 (62)
Male	1048 (38)
Age (missing = 19), y	
18–24	82 (3)
25–34	144 (5)
35–44	310 (11)
45–54	484 (18)
55-64	701 (26)
65–74	641 (24)
≥ 75	359 (13)
Race/ethnicity (missing = 90)	
Hispanic	431 (16)
Non-Hispanic white	1890 (71)
Non-Hispanic black	109 (4)
Non-Hispanic Asian	88 (3)
Non-Hispanic Native Hawaiian or other Pacific Islander	8 (<1)
Non-Hispanic American Indian or Alaska Native	7 (<1))
Non-Hispanic other/≥2 races	117 (4)
Education (missing = 36)	
8th grade or less	82 (3)
Some high school	152 (6)
High school graduate	583 (22)
Some college	1152 (43)
4-year college graduate	334 (12)
More than 4-year college graduate	401 (15)
Self-rated general health (missing = 30)	
Excellent	301 (11)
Very good	897 (33)
Good	1063 (39)
Fair	377 (14)
Poor	72 (3)
Self-rated mental health (missing = 24)	
Excellent	703 (26)
Very good	950 (35)
Good	737 (27)
Fair	280 (10)
Poor	46 (2)

Note: Response categories represent the items as administered in the survey.

Table III. Mean (SE) for Consumer Assessment of Healthcare Providers and Systems (CAHPS) scale differences according to location (N = 2740).

Variable	Location 1 (n = 845)	Location 2 (n = 230)	Location 3 (n = 875)	Location 4 (n = 204)	Location 5 (n = 336)	Location 6 (n = 250)
Location	North	South	North	South	South	South
PCMH recognized?	Yes	No	Yes	Yes	No	Yes
Data collection	Mail–Web	Mail–telephone	Mail–telephone	Mail–telephone	Mail–telephone	Mail–telephone
Scales						
Access	7.2^{b} (0.75)	5.5^{b} (1.65)	11.1^{a} (0.66)	0.0^{c} (2.03)	5.0^{b} (1.31)	0.4^{c} (1.75)
Communication	$4.0^{a,b}$ (0.61)	$1.3^{b,c}$ (1.49)	4.9^{a} (0.58)	$1.0^{b,c}$ (1.65)	0.0^{c} (1.21)	$2.5^{a,b,c}$ (1.28)
Office staff	$4.1^{a,b}$ (0.57)	1.3^{b} (1.47)	6.6^{a} (0.52)	2.3^{b} (1.44)	$4.0^{a,b}$ (0.94)	0.0^{c} (1.34)
Shared decision making	$5.0^{a,b}$ (1.27)	7.6^{a} (2.53)	7.9^{a} (1.13)	$4.7^{a,b}$ (2.92)	0.0^{b} (2.27)	7.0^{a} (2.29)
Self-management support	3.9^{a} (1.44)	3.5^{a} (2.68)	5.9^{a} (1.40)	5.8^{a} (2.92)	0.0^{a} (2.12)	2.0^{a} (2.65)
Attention to mental health	10.7^{a} (1.40)	$6.2^{a,b}$ (2.55)	10.3^{a} (1.37)	1.8^{b} (2.61)	0.0^{b} (1.99)	3.7^{b} (2.33)
Care coordination	$4.7^{a,b}$ (0.79)	$1.1^{b,c}$ (1.74)	7.1^{a} (0.72)	0.1^{c} (1.90)	0.3^{c} (1.43)	0.0^{c} (1.78)

PCMH = patient-centered medical home.

Note: Numbers are differences between the lowest (least positive) scoring location on the scale and the other 5 locations (0–100 possible score on scales). Superscripts denote rank order of means by site. Sites sharing a superscript on a composite (row) do not differ significantly.

Table IV. Number of responses per site needed for 0.70, 0.80, and 0.90 reliability.

Scale	Reliability = 0.70	Reliability = 0.80	Reliability = 0.90
Access to care	79	135	303
Communication with providers	295	506	1139
Office staff courtesy and respect	153	263	591
Shared decision making about medicines	396	679	1527
Self-management support	5979	10,250	23,063
Attention to mental health issues	218	374	842
Care coordination	156	268	603

Note: Estimates were derived by using the Spearman-Brown formula[8] from intraclass correlations reported in the text.

Sample sizes for each of the CAHPS PCMH survey items are given in Table V. The variance in sample size reflects the differential applicability of the content represented by the items. The smallest sample size (n = 222) and largest fraction of missing (0.93) was observed for item 16 (getting an answer to a medical question after regular office hours).

Item-scale correlations provide support for the items in the scales with 5 exceptions. One access item (no. 16: When phoning this provider's office after regular office hours, how often you did you get an answer to your medical question as soon as you needed?) correlated very weakly with the access to care scale. Two other access items (no. 14: Getting an answer to a medical question during regular office hours; no. 18: Seeing a provider within 15 minutes of the appointment time) correlated about as highly with the communication scale as with the hypothesized access to care composite. Finally, 2 of the shared decision making about medicine items (items 31 and 33) correlated as highly with the communication with providers scale as with their hypothesized scale.

As shown in Table VI, correlations among the 6 scales ranged from 0.09 (office staff courtesy and respect with attention to mental health issues) to 0.57 (communication with providers with shared decision making about medicine). The regression of the global rating of the provider item on the scales yielded an adjusted R^2 of 70% (n = 1431, $df = 26$, F = 128.22, $P < 0.0001$), with 4 of the 7 composites significantly, uniquely associated with the global rating (standardized regression coefficients followed by zero-order correlations): communication with providers (B = 0.65 [$P < 0.01$]; $r = 0.80$), shared decision making about medicines (B = 0.12 [$P < 0.01$]; $r = 0.56$), care coordination (B = 0.12 [$P < 0.01$]; $r = 0.56$), access to care (B = 0.04 [$P = 0.02$]; $r = 0.41$), self-management support (B = 0.03 [NS, $P = 0.10$]; $r = 0.30$), office staff courtesy and respect (B = –0.02 [NS, $P = 0.15$]; $r = 0.30$), and attention to mental health issues (B = 0.01 [NS, $P = 0.58$]; $r = 0.18$).

DISCUSSION

This study provides further information about the reliability and validity of the CAHPS PCMH survey. The study was limited to a West Coast sample of health maintenance organization members. In addition, the overall response rate was less than desired (37%). Despite these limitations, the study provided an important opportunity to evaluate the survey on a large sample of 2740 respondents in a different location and with a different system of care than the original published evaluation of the measure.[5]

Internal consistency reliabilities for the scales exceeded those in the previously published PCMH field test,[5] except for the office staff courtesy and respect scale (coefficient α was 0.80 in the present study vs 0.85 in the previous study; χ^2 [1 df] = 14.47, $P < 0.001$).[10] Site-level reliability estimates indicate that a 0.70 reliability can be achieved with <300 completed surveys per site for 5 of the 7 scales, and shared decision making requires ~396 completes. The self-management support scale did not discriminate among the 6 sites in this study. Site-level reliability was also suboptimal in the previous study, but there

Table V. Item-scale correlations for hypothesized scales (N = 2740).

Item	No. Before Imputation	Access	Communi-cation	Office Staff	Shared Decision Making	Self-Management Support	Attention to Mental Health	Care Coordination
6	1356	0.54*	0.41	0.29	0.29	0.16	0.08	0.25
9	2089	0.54*	0.37	0.30	0.24	0.17	0.09	0.25
14	1098	0.46*	0.44	0.32	0.30	0.13	0.13	0.24
16	222	0.07*	0.07	0.04	0.06	0.05	0.04	0.07
18	2696	0.37*	0.35	0.28	0.26	0.13	0.10	0.20
19	2720	0.46	0.79*	0.33	0.47	0.24	0.15	0.36
20	2717	0.45	0.87*	0.32	0.52	0.26	0.16	0.36
22	2351	0.46	0.84*	0.31	0.53	0.27	0.16	0.37
24	2708	0.45	0.71*	0.33	0.50	0.31	0.20	0.40
25	2723	0.40	0.82*	0.33	0.52	0.26	0.15	0.36
26	2719	0.45	0.76*	0.36	0.49	0.27	0.16	0.35
47	2693	0.39	0.36	0.68*	0.27	0.17	0.10	0.25
48	2705	0.31	0.34	0.68*	0.21	0.13	0.07	0.21
31	1449	0.31	0.57	0.25	0.53*	0.31	0.27	0.35
32	1434	0.26	0.39	0.17	0.50*	0.33	0.31	0.34
33	1431	0.29	0.46	0.22	0.45*	0.32	0.24	0.36
37	2694	0.19	0.31	0.17	0.35	0.44*	0.30	0.43
38	2675	0.15	0.22	0.11	0.33	0.44*	0.41	0.34
41	2702	0.11	0.15	0.07	0.30	0.34	0.65*	0.24
42	2709	0.14	0.20	0.09	0.31	0.39	0.68*	0.27
43	2712	0.10	0.14	0.08	0.26	0.33	0.62*	0.23
36	1342	0.14	0.21	0.13	0.22	0.27	0.15	0.20*
40	2441	0.16	0.28	0.13	0.33	0.29	0.21	0.25*
46	2740	0.07	0.11	0.07	0.1	0.27	0.18	0.19*
28-29	2395	0.43	0.47	0.31	0.37	0.26	0.16	0.20*

*Item-scale correlation is corrected for overlap of the item with the scale score.

was strong stakeholder support for including it, and it was therefore retained by Scholle et al.[2]

The item of getting an answer to a medical question after regular office hours (item 16) correlated weakly with the access to care scale in the present study, but it correlated reasonably well with the access scale (r = 0.53) in the study by Scholle et al.[5] Only 8% of the respondents in this study reported telephoning the provider's office after hours. In this system of care, medical questions after regular hours are directed to the "advice nurse" line. Physician groups in other systems of care plan for after-hours medical questions in various ways (eg, answering service, partner with physicians in nearby medical groups to arrange an "on-call" system); few patients would therefore call the provider's office knowing that the office is closed. Refinement of the gate question to capture after-hours calls may be needed.

The question of saw the provider within 15 minutes of appointment time (item 18) correlated as highly with the communication scale as with the access scale. This item had the lowest correlation of all the items representing access with the access scale score in the previous study.[5] The item of got an answer to a medical question during regular office hours (item 14) also correlated as highly with the communication scale as with the access scale in this study.

Two of the shared decision-making questions (items 31 and 33) correlated as highly with the communication with providers scale as with the other items in the shared decision-making scale. The shared decision-making scale also correlated (0.57) with the communication with providers scale, and this was the largest correlation among the 7 CAHPS scales. Despite this fact, the shared decision-making scale had the second strongest unique association in the multiple regression

Table VI. Correlations among scales.

Scale	Access to Care	Communication With Providers	Office Staff Courtesy and Respect	Shared Decision Making About Medicines	Self-Management Support	Attention to Mental Health Issues	Care Coordination
Access	1.00						
Communication	0.47	1.00					
Office staff	0.37	0.38	1.00				
Shared decision making	0.31	0.57	0.20	1.00			
Self-management support	0.19	0.31	0.17	0.38	1.00		
Attention to mental health	0.14	0.19	0.09	0.31	0.42	1.00	
Care coordination	0.32	0.44	0.25	0.42	0.36	0.24	1.00

Note: Pairwise correlations, all P values < 0.0001.

of the global rating of the provider item on the CAHPS scales (tied with care coordination). Shared decision making about medications is one aspect of communication with providers, but it has reduced application because not all patients are taking medications.

Concerns about ceiling effects for the CAHPS communication scale have resulted in debates about its value in the calculation of overall performance by organizations such as the National Committee for Quality Assurance. As noted by Quigley et al[11] and supported in the present study, the CAHPS communication scale is psychometrically sound and has the strongest relationship to overall ratings of the provider of care. These findings support continuing use of the communication with provider scale for health plan and other accreditation efforts. Moreover, a recent study suggested that it may be important to focus on individual communication items for quality improvement efforts and that the item of showing respect for what patients say is especially important for specialty care.[12]

Among the 4 sites of care in the south, there were no clear differences in scores between the sites with and without PCMH recognition, except on access to care; for this topic, the non-PCMH sites performed significantly higher. The scale score differences according to site show that one of the non-PMCH sites (location 5) had the lowest scores for 4 of the 7 CAHPS scales. However, the other non-PCMH site (location 2) scored relatively well. These results indicate that PCMH recognition is not necessarily associated with higher CAHPS PCMH scores. In addition, for practices that are part of a larger system of care, the administration of the CAHPS PCMH survey at the system level may suffice, as results at the practice-site level will not gain additional information.

CONCLUSIONS

The results reported here support the CAHPS PCMH survey scales in general, but the performance of the self-management support and shared decision making about medicines scales was suboptimal. Further refinement of these scales to improve reliability and to distinguish shared decision making from communication with providers is recommended. Additional evaluation of the existing scales and any modifications to them need to be performed. The 37% response rate in this study exceeded the 25% response rate obtained in the study by Scholle et al.[2] Despite this improvement, the response rate for Spanish-language respondents was extremely

low (9%). Future work is needed to enhance participation rates in this important subgroup of the overall population.

ACKNOWLEDGMENT

This study was supported by a cooperative agreement from the Agency for Healthcare Research and Quality (2U18HS016980). Ron D. Hays was also supported by NIH/NIA Grants P30-AG028748 and P30-AG021684, and NCMHD Grant 2P20MD000182. Karen L. Spritzer was supported by Ron D. Hays discretionary funds.

CONFLICTS OF INTEREST

The Agency for Healthcare Research and Quality had no involvement in the study design, collection, analysis, or interpretation of the data reported in this article. The authors have indicated that they have no conflicts of interest regarding the content of this article.

SUPPLEMENTAL MATERIAL

Supplementary material cited in this article is available online at http://dx.doi.org/10.1016/j.clinthera.2014.04.004.

REFERENCES

1. Bitton A, Martin C, Landon BE. A nationwide survey of patient-centered medical home demonstration projects. *J Gen Intern Med*. 2010;25:584–592.
2. Scholle SH, Vuong O, Ding L, et al. Development of and field test results for the CAHPS PCMH survey. *Med Care*. 2012;11:S2–S10.
3. Dyer N, Sorra JS, Smith SA, et al. Psychometric properties of the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) clinician and group adult visit survey. *Med Care*. 2012;50:S28–S34.
4. Hays RD, Chong K, Brown J, et al. Patient reports and ratings of individual physicians: an evaluation of the DoctorGuide and CAHPS® provider level surveys. *Am J Med Qual*. 2003;18:190–196.
5. Hays RD, Martino S, Brown J, et al. Evaluation of a care coordination measure for the Consumer Assessment of Healthcare Providers and System (CAHPS®) Medicare Survey. *Med Care Res Rev*. 2014;71:192–202.
6. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika*. 1951;16:297–334.
7. Hays RD, Wang E, Sonksen M. General reliability and Intraclass Correlation Program (GRIP). *Proceedings of the 3rd Annual Western Users of SAS Conference*. Long Beach, CA; 1995: 220–223.
8. Clark E. Spearman-Brown formula applied to ratings of personality traits. *J Educ Psychol*. 1935;26:552–555.
9. Hays RD, Revicki DR. Reliability and validity (including responsiveness). In: Fayers P, Hays RD, eds. *Assessing Quality of Life in Clinical Trials: Methods and Practice*. 2nd ed. Oxford, UK: Oxford University Press; 2005:25–39.
10. Feldt LS, Woodruff DJ, Salih FA. Statistical inference for coefficient alpha. *App Psych Measure*. 1987;11:93–103.
11. Quigley DD, Martino SC, Brown JA, et al. Evaluating the content of the communication items in the CAHPS® Clinician and Group Survey and supplemental items with what high-performing physicians say they do. *Patient*. 2013;6:169–177.
12. Quigley DD, Elliott MN, Farley DO, et al. Specialties differ in which aspects of doctor communication predict overall physician ratings? *J Gen Intern Med*. 2014;29:447–454.

Address correspondence to: Ron D. Hays, PhD, UCLA Division of General Internal Medicine and Health Services Research, 911 Broxton Avenue, Los Angeles, CA 90024. E-mail: drhays@ucla.edu

SUPPLEMENTARY MATERIALS

Supplemental Table I. Consumer Assessment of Healthcare Providers and Systems (CAHPS) Patient-Centered Medical Home (PCMH) Adult Survey Content.

Access to health care (5 items)

- 6. Getting appointments for urgent care
- 9. Getting appointments for routine care
- 14. Getting an answer to a medical question during regular office hours
- 16. Getting an answer to a medical question after regular office hours
- 18. Saw provider within 15 minutes of appointment time

Communication with providers (6 items)

- 19. Provider explanations easy to understand
- 20. Provider listens carefully
- 22. Provider gives easy to understand information
- 24. Provider knows important information about medical history
- 25. Provider shows respect for what you have to say
- 26. Provider spends enough time with you

Courteous and helpful office staff (2 items)

- 47. Clerks and receptionists were helpful
- 48. Clerks and receptionists treat you with courtesy and respect

Shared decision making about medicine (3 items)

- 31. Provider talked about reasons to take a medicine*
- 32. Provider talked about reasons not to take a medicine*
- 33. Provider asked what you thought was best for you regarding medicine*

Self-management support (2 items)

- 37. Provider talked with you about specific goals for your health*
- 38. Provider asked you if there were things that make it hard for you to take care of your health*

Attention to mental health issues (3 items)

- 41. Talked about feeling sad or depressed*
- 42. Talked about worry or stress in your life*
- 43. Talked about personal or family problem/alcohol or drug use*

Care coordination (4 items)

- 28 and 29. Got test results as soon as needed*
- 36. Provider seemed informed and up-to-date about care you got from specialists*
- 40. Talked about prescription medicines you are taking†
- 46. Got help managing care, tests, or treatment†

*Items in the CAHPS PCMH survey added beyond the CAHPS clinician and group survey core.
†Items in the CAHPS Medicare survey.