ORIGINAL RESEARCH

Assessing the Associations of Patient-Reported Perceptions of Patient-Centered Care as Supplemental Measures of Health Care Quality in VA

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BACKGROUND: Patient-reported experience measures (PREMs) are useful for assessing health care quality and safety and patients' perceptions of health care.

OBJECTIVE: We aimed to assess the relationship between PREMS [e.g., measures of patient-centered care (PCC)] and health care quality metrics.

DESIGN: We conducted a national survey via mail. Survey data were supplemented with US Department of Veteran Affairs (VA) administrative data.

PARTICIPANTS: Veteran ($n = 5512$) VA health care users participated in the study.

MAIN MEASURES: PCC measures included: patient activation; shared decision-making (SDM); empathy and holistic care; chronic illness care; perceptions of participation, respect for choices, and support; and overall health care experience. Health care quality measures included: preventive care screening receipt; chronic condition management (diabetes, hypertension); and health care utilization (hospitalizations, emergency room (ER) visits). Analyses included: bivariate comparisons of PCC measures by health care quality measures; and multivariate linear regression to identify variables associated with attaining multiple positive health care quality indicators (when controlling for potential confounders).

KEY RESULTS: PREMs assessing factors relating to patient–provider communication (e.g., empathic provider care, shared decision-making) are mainly related to clinical indicators representing good chronic condition management, while those relating more broadly to health care in general (e.g., patient activation, chronic illness care) are mainly related to measures of appropriate health care use (e.g., preventive care screening receipt; potentially avoidable hospitalizations; unscheduled care, such as ER visits). When controlling for potential confounders, higher perceptions of the decision-making effectiveness component of SDM ($\beta = 0.004$, $p = 0.03$) and empathy and holistic care ($\beta = 0.01$, $p = 0.02$) showed a weak but positive relationship with attaining a greater number of positive health care quality indicators, while a weak but negative relationship emerged for perceptions of participation, respect for choices, and support ($\beta = -0.003$, $p = 0.03$) and overall VA experiences ($\beta = -0.10$, $p = 0.04$).

CONCLUSIONS: PREMs that measure PCC offer rich data about health care quality while engaging patients, and considering patient experiences and preferences, in performance assessment. PREMs may be used to supplement existing performance metrics.

BACKGROUND

The health care landscape is changing from a paternalistic provider-centered model to a patient-centered care (PCC) model focused on patients' individual preferences and needs.[1,2] The large integrated Veterans Affairs (VA) health care system[3] has shifted its goals and priorities accordingly.[4] VA goals outlined in the Blueprint for Excellence focus on providing high-quality personalized health care that engages patients and optimizes Veteran's experiences.[5] This focus directly aligns with the PCC transformation being pursued across many health care systems.

With these goals in mind, it is essential to account for emerging priorities when health care facilities measure hospital performance. PCC encompasses a number of key concepts, each capturing a distinct measurable facet of the patient health care experience that can be directly assessed. These concepts include: patient activation;[6,7] shared patient/provider decision-making;[8,9] empathy and holistic care in the patient–provider relationship;[6,7] chronic care delivery;[10] and timely, accessible care that meets patient's needs, preferences, and results in optimal satisfaction.[6,9]

A variety of measures can be used to assess impacts of PCC and patient experiences on health care quality, including preventive care screenings, e.g., breast, cervical and colorectal cancer screening;[11] chronic condition care and management, e.g., appropriate tests of (and abnormal tests results for) common chronic conditions like diabetes[11–14] and hypertension;[11–13] and emergency room (ER) and inpatient (IP)[11–14] utilization outcomes. While such metrics are indicative of health care quality, they do not consider patient preferences, or engage patients in assessment efforts.

Patient-reported experience measures (PREMs) may be a useful and meaningful way to assess the safety and quality of health care.[15,16] PREMs that measure important PCC constructs engage patients and provide insight into what truly matters most to them, while simultaneously providing important information about the quality and patient-centeredness of the health care they receive.

Objective. The objective of the current paper was to assess the relationship between a number of PREMs (defined here as measures of constructs necessary for the delivery of quality PCC) and select metrics of health care quality for Veterans receiving VA health care, in order to examine the appropriateness of using PCC measures in tandem with these metrics.

Hypotheses. We expected that PCC measures related to patient–provider communication (e.g., empathic provider care, shared decision-making (SDM)) would be higher among individuals with good chronic condition management, while perceptions of measures related to general health care (e.g., patient activation, chronic illness care) would be higher among individuals who received appropriate preventive care screenings and had no prior-year IP or ER use. Additionally, we hypothesized an association between higher PCC perceptions and attaining multiple positive health care quality indicators (controlling for potential confounders).

METHODS

Design

A cross-sectional mailed national survey provided demographics, and PREMs of several distinct constructs integral to the delivery of PCC: patient activation, SDM, empathy and holistic care, chronic illness care, perceptions of level of participation, respect for choices and support, and overall patient health care experience. These PCC measures were selected to provide a comprehensive picture of patients' perceptions of the patient-centeredness of their health care. VA administrative databases provided preventive care screening receipt, chronic condition management, and health care utilization data.

Participants/Setting

Data were collected from a sample of Veterans who received ≥ 1 IP or outpatient VA health care encounter from the beginning of April through the end of September 2012, at one of eight nationally distributed VA medical centers. Stratified random sampling, along with Dillman's sample size selection equation[17] were used to ensure adequate power and generalizability of results to the Veteran population at large.

Data Collection

Surveys and a business reply envelope were mailed in early 2013 with an informational letter detailing the study and ensuring anonymity. A follow-up mailing was conducted with non-respondents about 6 weeks later to facilitate response. Survey data were supplemented with VA administrative data.

Main Measures

Demographics and participant characteristics. Collected included: gender; age; race/ethnicity; highest level of education completed; current relationship/marital status; living arrangement; and distance from/travel time to most often used VA facility.

Patient-Reported Perceptions of PCC Constructs Included:. *The Patient Activation Measure (PAM).* , a 13-item [response options: 1 = strongly agree through 4 = strongly disagree] questionnaire assessing patient activation (e.g., patient engagement in health care, self-management).[18] The PAM is scored by adding responses and converting the sum to an overall patient activation score (range: 0–100) using a conversion table provided by the scale's developers. Higher scores indicate greater patient activation. Using cut-scores, the overall activation score is classified into one of four activation stages (stage 1: lowest activation; stage 4: highest activation).

The Combined Outcome Measure for Risk Communication and Treatment Decision Making Effectiveness (COMRADE). , a 20-item [response options: 1 = strongly disagree through 5 = strongly agree] measure assessing patient perceptions of SDM.[19] Scores (range: 0–100) for two subscales (risk communication and treatment decision-making effectiveness) are calculated based on an algorithm provided by the scale's developers. Higher scores indicate greater perceptions of SDM.

The Consultation and Relational Empathy (CARE). , is a ten-item [response options: 1 = poor through 5 = excellent] measure assessing empathy, holistic care and patient–provider communication.[20] We adapted the wording of the items slightly, such that questions were reflective of VA health care (e.g., replaced 'consultation' with 'visit' or 'clinical encounter'). An overall score (range: 10–50) is computed by adding item responses. Higher scores indicate greater perceptions of empathy, holistic care and patient–provider communication.

The Patient Assessment of Chronic Illness Care (PACIC). , a 20-item [response options: 1 = no/never through 5 = yes/always] measure assessing patient perceptions of chronic illness care.[21] Item responses are summed and averaged; mean scores (range: 1–5) are reported for the overall scale and five sub-scales (patient activation, delivery system design, goal setting/tailoring, problem solving/contextual counseling, follow-up/care coordination). Higher scores indicate better perceptions of chronic illness care.

The 5 Press-Ganey Questions. [response options: 1=very poor through 5=very good] assess patient's perceptions of participation, respect for choices and support.[22] An overall score (range: 0–100) is computed by adding item responses, and converting the sum to a 0–100 point scale.[23]

The Global Practice Experience Measure (GPE). , a two-item [response options: 1=strongly disagree through 5=strongly agree] measure assessing patient's overall health care experience.[24,25] Scores are presented as the proportion of respondents who achieve a 'fully successful' rating (e.g., responded 'strongly agree' to *both* questions).

Measures of Health Care Quality (Administrative Data) Included:. Appropriate (e.g., guideline concordant) *preventive care screening receipts* were collected for breast and cervical cancer screenings among female respondents, prostate cancer screening among male respondents, and colorectal cancer screening among all respondents (*see* Table 1 footnotes, 'guideline concordant screening' definitions). Using CPT and ICD-9 procedure codes recorded in VA administrative databases, we examined patients who had received ≥ 1 (vs. no) preventive care screening. Prior-year *chronic condition management indicators* were collected for two common conditions: diabetes and hypertension; poor diabetes management was defined as glycated hemoglobin (HbA1c) ≥ 9 %,[27] among patients who had a diabetes diagnosis and a HbA1c test; poor hypertension management was defined as blood pressure ≥ 140/90,[28] among patients who had a hypertension diagnosis and a blood pressure reading. Individuals with good (vs. poor) condition management were compared for diabetes and hypertension groups, respectively. Minimization of costly health care utilization of potentially avoidable services (e.g., IP stays, ER visits) is key; as such, we collected *health care utilization* variables, including: number of prior-year IP stays; number of prior-year ER visits; individuals with ≥1 prior-year visit (vs. none) were compared for IP stays and ER visits, respectively.

Statistical Analyses

Bivariate comparisons (chi-square test for categorical outcomes, *t* tests for continuous outcomes) were used to compare scores on PCC measures between patients who had received ≥ 1 (vs. no) appropriate preventive care screening; good (vs. poor) condition management of diabetes and hypertension, respectively; ≥ 1 hospitalization (vs. none); and ≥ 1 ER visit (vs. none). Measures of effect size were computed for significant bivariate associations; please see footnotes of Tables 1, 2, 3, 4, and 5 for effect sizes, as appropriate.

A multivariate linear regression was conducted to identify variables associated with multiple positive health care quality indicators (controlling for potential confounders). Demographic variables were selected for inclusion in the model based on associations in the literature with our health care quality metrics; PCC measures were then added to the model to assess the relationship between our PREMs and the number of positive health care quality indicators patients achieved. Final model variables were: male gender; age; white race/ethnicity; education (college graduate); marital status (married); living arrangement (live with formal caregiver); and our PREM score measures of PCC.

An alpha level of 0.05 was used to determine statistical significance. Statistical analyses were performed with SAS 9.2 (SAS Institute Inc., Cary, NC). This project was conducted as part of a quality improvement effort (as classified by the VA Central IRB) to evaluate PCC in the VA health care system.

RESULTS

Surveys were mailed to 16,425 Veterans; 674 surveys were returned undeliverable, 77 were returned because the individual had passed away, and 45 because the recipient felt the survey was non-applicable. The denominator was adjusted to 15,629. Data were available for 5512 Veteran patients (response rate: 35.3 %).

Bivariate Comparison Results

Demographics and participant characteristics appear in Tables 1, 2, 3, 4, and 5.

Appropriate *preventive care screening receipt* (Table 1). Overall, 82.3 % of respondents had received ≥ 1 instance of preventive care screening. As hypothesized, individuals who had received ≥ 1 (vs. no) appropriate preventive care screening reported higher perceptions of chronic illness care (3.1 vs. 3.0, $p=0.006$), but lower perceptions of consultation and relational empathy (38.6 vs. 39.7, $p=0.009$) and participation, respect for choices, and support (74.4 vs. 76.5, $p=0.01$).

Prior-year *chronic condition management, diabetes* (Table 2). Overall, 34.1 % of respondents had diabetes; among them, 84.4 % had a prior-year HbA1c test result, and 84.7 % had good condition management. As hypothesized, respondents with good (vs. poor) condition management reported higher perceptions of SDM (62.9 vs. 58.7, $p=0.001$) and consultation and relational empathy (39.4 vs. 35.2, $p<0.0001$), along with higher problem solving/contextual counseling in the context of chronic illness care (3.4 vs. 3.2, $p=0.01$), participation, respect for choices, and support (75.4 vs. 69.8, $p<0.0001$), and a trend toward higher overall perceptions of experiences with their VA facility (27.5 % fully successful rating on the GPE measure vs. 21.0 %, $p=0.06$).

Prior-year *chronic condition management, hypertension* (Table 3). Overall, 71.8 % of respondents had hypertension; among them, 93.0 % had a prior-year blood pressure reading, and 72.2 % had good condition management. As hypothesized, patients with good (vs. poor) condition management reported higher perceptions of: SDM (62.5 vs. 59.7, $p<0.0001$), consultation and relational empathy (39.1 vs. 37.3, $p<0.0001$), and also higher participation, respect for choices, and support (75.2 vs. 72.5, $p<0.001$).

Table 1. Comparisons of Patient Perceptions of PCC Measures by Appropriate Preventive Care Screening Receipt, Any (Cervical, Breast, Prostate, Colorectal Cancer Screenings) vs. None ($n = 5052$)

	Overall ($n = 5052$)	No preventive care screening ($n = 893$)	Any preventive care screening[a] ($n = 4159$)	*p* value
Demographics and patient characteristics				
Gender [Male] ($n = 5052$)	93.57	93.95	93.48	0.6043
Age (years): mean (range) standard deviation ($n = 5052$)	68.42 (23.00–100.00) 11.32	74.31 (23.00–100.00) 13.15	67.16 (25.00–96.00) 10.46	**< 0.0001**
Race/Ethnicity [White][b] ($n = 4969$)	68.71	80.05	66.28	**< 0.0001**
Education[c] **[College graduate]** ($n = 5035$)	27.11	34.20	25.59	**< 0.0001**
Marital status[d] **[Married]** ($n = 5024$)	57.32	64.57	55.77	**< 0.0001**
Living arrangement [Live with formal caregiver][e] ($n = 5018$)	1.85	3.04	1.60	**0.0038**
Average distance from VA (miles): mean (range) standard deviation ($n = 5052$)	28.22 (0.00–2000.00) 50.59	23.22 (0.00–300.00) 25.09	29.29 (0.00–2000.00) 54.47	**0.0011**
Average travel time to VA (minutes): mean (range) standard deviation ($n = 4934$)	43.71 (0.00–960.00) 38.02	39.53 (2.00–273.00) 29.25	44.58 (0.00–960.00) 39.55	**0.0004**
Patient perceptions of PCC constructs				
PAM ($n = 4879$) [mean (range) SD]	56.05 (0.00–100.00) 19.47	56.36 (0.00–100.00) 19.54	55.98 (0.00–100.00) 19.46	0.60
COMRADE				
Risk communication ($n = 4356$) [mean (range) SD]	56.30 (0.61–93.33) 17.69	55.59 (0.61–82.73) 18.18	56.43 (0.61–93.33) 17.60	0.25
Decision-making effectiveness ($n = 4359$) [mean (range) SD]	61.79 (15.54–93.26) 16.88	61.42 (19.56–93.26) 17.64	61.86 (15.54–90.80) 16.74	0.54
CARE ($n = 4873$) [mean (range) SD]	38.74 (10.00–50.00) 11.02	39.65 (10.00–50.00) 10.77	38.55 (10.00–50.00) 11.06	**0.009[f]**
PACIC ($n = 4641$) [mean (range) SD]	3.07 (1.00–5.00) 1.12	2.96 (1.00–5.00) 1.12	3.09 (1.00–5.00) 1.12	**0.006[g]**
Patient activation ($n = 4582$)	3.33 (1.00–5.00) 1.24	3.26 (1.00–5.00) 1.26	3.34 (1.00–5.00) 1.24	*0.09*[h]
Delivery systems design ($n = 4593$)	3.42 (1.00–5.00) 1.16	3.30 (1.00–5.00) 1.19	3.44 (1.00–5.00) 1.16	**0.003[i]**
Goal setting/Tailoring ($n = 4575$)	3.04 (1.00–5.00) 1.24	2.88 (1.00–5.00) 1.26	3.07 (1.00–5.00) 1.23	**< 0.001[j]**
Problem solving/Contextual counseling ($n = 4542$)	3.24 (1.00–5.00) 1.30	3.20 (1.00–5.00) 1.30	3.25 (1.00–5.00) 1.30	0.30
Follow-up/Care coordination ($n = 4563$)	2.58 (1.00–5.00) 1.25	2.45 (1.00–5.00) 1.24	2.60 (1.00–5.00) 1.25	**0.003[k]**

IP Health care utilization (Table 4). Overall, 8.2 % of respondents had ≥ 1 prior-year IP visit. As hypothesized, respondents who had no (vs. ≥ 1) prior-year IP visits reported higher perceptions of patient activation (56.5 vs. 53.2, $p = 0.001$) and also higher perceptions of empathy/holistic care (38.6 vs. 37.4, $p = 0.03$), but contrary to hypotheses, lower perceptions of chronic illness care coordination (2.6 vs. 2.7, $p = 0.003$).

Health care utilization, ER visits (Table 5). Overall, 17.9 % of respondents had ≥ 1 prior-year ER visits. Respondents who had no (vs. ≥ 1) prior-year ER visits reported higher perceptions of: patient activation, as hypothesized (56.6 v. 54.6, $p = 0.004$), SDM (61.6 vs. 59.8, $p = 0.004$), empathy/holistic care (38.8 v. 36.9, $p < 0.0001$), and participation, respect for choices, and support (74.7 vs. 72.3, $p = 0.001$), but contrary to hypotheses,

lower perceptions of chronic illness care follow-up/care coordination (2.5 vs. 2.7, $p = 0.002$).

Multivariate linear regression results (Table 6) indicated several demographic factors related to patients with a greater number of positive health care quality indicators; older age ($\beta = 0.03$, $p < .0001$) and being married ($\beta = 0.12$, $p = 0.002$) were positively related to a greater number of positive health care quality indicators while being a college graduate ($\beta = -0.12$, $p = 0.01$) and living with a formal caregiver ($\beta = -0.50$, $p = 0.002$) had a negative relationship. As hypothesized, when controlling for potential confounders, higher perceptions of the decision-making effectiveness component of SDM ($\beta = 0.004$, $p = 0.03$) and empathy and holistic care ($\beta = 0.01$, $p = 0.02$) had a weak but positive relationship with a greater number of positive health care

<div align="center">Table 1.. (continued)</div>

	Overall (*n* = 5052)	No preventive care screening (*n* = 893)	Any preventive care screening[a] (*n* = 4159)	*p* value
Press-Ganey (*n* = 4267) [mean (range) SD]	74.75 (0.00–100.00) 19.72	76.50 (0.00–100.00) 19.74	74.40 (0.00–100.00) 19.71	**0.01**[l]
GPE (*n* = 3912)				0.58
Successful	26.30	25.42	26.48	
Not successful	73.70	74.58	73.52	

[a]*Preventive care screenings examined were: breast, cervical, prostate and colorectal cancer screenings, and were defined as follows:*

Breast: Of female participants, received a clinical breast exam in the prior 3 years for women aged 20–39; received a clinical breast exam or mammogram in the prior year for women aged 40 and over[26]

Cervical: Of female participants, received a pap smear in the prior 3 years for women aged 21–29; received a pap smear and an HPV test in the prior 5 years or received a pap smear in the prior 3 years for women aged 30–65.[26] *For our purposes, despite current guidelines stating that women aged 65 and over do not need to receive cervical cancer screenings, if a woman Veteran was aged 30 or over (including those over the age of 65) we used the guidelines for women aged 30–65, as those guidelines specify that if pap test results indicate pre-cancer of the cervix, testing must continue for the following 20 years at minimum, even if that woman surpasses the age of 65.*

Prostate: Of male participants, received prostate-specific antigen blood test in the prior year for African American men aged 45 (considered high-risk) or older and all other men aged 50 or older[26]

Colorectal: Of men and women aged 50 or over, received a flexible sigmoidoscopy in the prior 5 years; or received a colonoscopy in the prior 10 years; or received a barium enema in the prior 5 years; or received a colonography in the prior 5 years; or received a guaiac-based fecal occult blood test in the prior year; or received a fecal immunochemical test in the prior year; or received a stool DNA test in the prior 3 years[26]

Of our sample, 56.6 % of female respondents had received a breast cancer screening and 61.2 % had received a cervical cancer screening, 64.4 % of male respondents had received a prostate cancer screening, and 65.2 % of respondents had received a colorectal screening.

[b]*Reference: Black/African American, Hispanic/Latino, Asian, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, other*
[c]*Reference: did not complete elementary school, elementary school, some high school, high school graduate, some college or technical school*
[d]*Reference: member of an unmarried couple, separated/divorced, widowed, never married*
[e]*Reference: live: alone, with a family member/friend/spouse, other*
[f]*Effect size (Hedge's g): 0.10*
[g]*Effect size (Hedge's g): −0.10*
[h]*Effect size (Hedge's g): −0.06*
[i]*Effect size (Hedge's g): −0.11*
[j]*Effect size (Hedge's g): −0.14*
[k]*Effect size (Hedge's g): −0.11*
[l]*Effect size (Hedge's g): 0.09*

quality indicators. Contrary to hypotheses, a weak but negative relationship emerged for participation, respect for choices, and support ($\beta = -0.003$, $p = 0.03$) and overall VA experiences ($\beta = -0.10$, $p = 0.04$). The model accounted for approximately 12 % of the variance in having a greater number of positive health care quality indicators.

DISCUSSION

The current paper presents associations of PREMs with commonly used health care quality metrics in a large national sample of Veterans receiving VA health care, a topic which (to the best of our knowledge) has not been previously examined. Collectively, our data underscore two important points: (1) measures of PCC are related to commonly used performance metrics, and distinct PREMs have a unique relationship with health care quality, and (2) PREMs offer unique information about health care quality (beyond common metrics), and would make an informative and useful addition to VA hospital performance assessment.

Our results indicate that PCC measures of patient–provider communication (e.g., empathic provider care, SDM) are mainly related to clinical indicators representing good chronic condition management. These findings are consistent with recent reports that SDM approaches, and greater empathy from physicians, may be most impactful for providing effective chronic condition care.[29,30] Through mechanisms such as maximized health care planning and patient understanding, effective patient–provider communication has been linked to important factors (e.g., self-management, treatment adherence) that lead to improved chronic condition management.[31] Further, our findings identified increased patient perceptions of empathy/holistic care and SDM as being related to positive health care quality indicators. These results indicate that a distinct relationship may exist between the quality of provider communication and how effectively patients are able to manage their health.

Our findings further indicate that PCC measures of general health care (e.g., patient activation, chronic illness care) are mainly related to measures of appropriate health care use (e.g., preventive care screening receipt; potentially avoidable IP stays; unscheduled care such as ER visits). These relationships are similar to those found between delivery of PCC and decreased health services utilization.[32] For instance, higher patient activation has been associated with increased likelihood of preventive care screening receipt and decreased likelihood of ER use,[33] and PCC delivery has been associated with decreased IP utilization.[13] Findings suggest these PREMs offer insight into specific facets of patient health behaviors, distinct from PREMs examining the patient–provider relationship.

Table 2. Comparisons of Patient Perceptions of PCC Measures for Diabetic Patients with an HbA1C Test and Good (vs. Poor) Condition Management (*n* = 1585)

	Overall (*n* = 1585)	Good condition management (*n* = 1342)	Poor condition management (*n* = 243)	*p* value
Demographics and patient characteristics				
Gender [Male] (*n* = 1579)	95.95	95.74	97.11	0.3197
Age (years): mean (range) standard deviation (*n* = 1556)	68.00 (31.00–94.00) 10.09	68.81 (31.00–94.00) 10.05	63.53 (35.00–92.00) 0.59	**< 0.0001**
Race/Ethnicity [White][a] (*n* = 1558)	62.71	64.34	53.75	**0.0018**
Education [College graduate][b] (*n* = 1578)	23.07	23.43	21.07	0.4238
Marital status [Married][c] (*n* = 1577)	59.99	61.33	52.50	**0.0101**
Living arrangement [Live with formal caregiver][d] (*n* = 1574)	1.33	1.35	1.24	0.8955
Average distance from VA (miles): mean (range) standard deviation (*n* = 1585)	28.18 (0.13–1200.00) 46.07	26.87 (0.13–314.00) 30.24	35.42 (1.00–1200.00) 93.61	**0.0077**
Average travel time to VA (minutes): mean (range) standard deviation (*n* = 1546)	43.81 (2.00–360.00) 35.25	43.47 (2.00–360.00) 35.61	45.70 (5.00–240.00) 33.11	0.3739
Patient perceptions of PCC constructs				
PAM (*n* = 1538) [mean (range) SD]	55.81 (0.00–10.00) 19.39	56.13 (0.00–100.00) 19.59	53.98 (0.00–100.00) 18.16	0.12
COMRADE				
Risk communication (*n* = 1412) [mean (range) SD]	56.24 (0.61–93.33) 17.60	56.59 (0.61–93.33) 17.42	54.41 (13.94–81.67) 18.46	*0.09*[e]
Decision-making effectiveness (*n* = 1412) [mean (range) SD]	62.23 (15.67–89.38) 16.60	62.89 (15.67–89.38) 16.26	58.73 (19.04–87.44) 17.92	**0.001**[f]
CARE (*n* = 1542) [mean (range) SD]	38.75 (10.00–50.00) 11.03	39.40 (10.00–50.00) 10.72	35.23 (10.00–50.00) 11.99	**< 0.0001**[g]
PACIC (*n* = 1527) [mean (range) SD]	3.19 (1.00–5.00) 1.13	3.21 (1.00–5.00) 1.12	3.12 (1.00–5.00) 1.18	0.26
Patient activation (*n* = 1512)	3.33 (1.00–5.00) 1.25	3.35 (1.00–5.00) 1.23	3.22 (1.00–5.00) 1.34	0.14
Delivery systems design (*n* = 1516)	3.53 (1.00–5.00) 1.14	3.55 (1.00–5.00) 1.13	3.40 (1.00–5.00) 1.22	*0.06*[h]
Goal setting/Tailoring (*n* = 1517)	3.19 (1.00–5.00) 1.23	3.20 (1.00–5.00) 1.23	3.17 (1.00–5.00) 1.26	0.79
Problem solving/Contextual counseling (*n* = 1506)	3.34 (1.00–5.00) 1.27	3.37 (1.00–5.00) 1.26	3.15 (1.00–5.00) 1.32	**0.01**[i]
Follow-up/Care coordination (*n* = 1510)	2.82 (1.00–5.00) 1.26	2.82 (1.00–5.00) 1.26	2.79 (1.00–5.00) 1.25	0.75
Press-Ganey (*n* = 1388) [mean (range) SD]	74.54 (0.00–100.00) 19.55	75.43 (0.00–100.00) 19.12	69.84 (0.00–100.00) 21.09	**< 0.0001**[j]
GPE (*n* = 1229)				*0.06*[k]
Successful	26.44	27.47	21.03	
Not successful	73.56	72.53	78.97	

[a]*Reference: Black/African American, Hispanic/Latino, Asian, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, other*
[b]*Reference: did not complete elementary school, elementary school, some high school, high school graduate, some college or technical school*
[c]*Reference: member of an unmarried couple, separated/divorced, widowed, never married*
[d]*Reference: live: alone, with a family member/friend/spouse, other*
[e]*Effect size (Hedge's g): 0.12*
[f]*Effect size (Hedge's g): 0.24*
[g]*Effect size (Hedge's g): 0.38*
[h]*Effect size (Hedge's g): 0.13*
[i]*Effect size (Hedge's g): 0.17*
[j]*Effect size (Hedge's g): 0.27*
[k]*Effect size (Cramer's V): −0.05*

Interestingly, individuals who had both ≥ 1 prior-year IP and ER visits reported lower perceptions of chronic illness care follow-up/care coordination. Literature stresses the importance of follow-up and care coordination for individuals with chronic conditions following an IP or ER visit,[34] and these aspects of care may require additional emphasis for individuals with a

Table 3. Comparisons of Patient Perceptions of PCC Measures for Hypertensive Patients with Blood Pressure Measurements and Good (vs. Poor) Condition Management (n = 3677)

	Overall (n = 3677)	Good condition management (n = 2653)	Poor condition management (n = 1024)	p value
Demographics and patient characteristics				
Gender [Male] (n = 3664)	95.88	96.40	94.53	**0.0103**
Age (years): mean (range) standard deviation (n = 3620)	68.58 (26.00–96.00) 11.31	70.34 (26.00–96.00) 11.14	63.97 (27.00–96.00) 10.41	**< 0.0001**
Race/Ethnicity [White] [*] (n = 3622)	67.09	72.10	54.11	**< 0.0001**
Education [College graduate] [†] (n = 3660)	24.54	25.35	22.42	0.0649
Marital status [Married] [‡] (n = 3646)	57.95	61.16	49.60	**< 0.0001**
Living arrangement [Live with formal caregiver] [§] (n = 3654)	1.72	1.71	1.77	0.8911
Average distance from VA (miles): mean (range) standard deviation (n = 3677)	27.87 (0.00–1200.00) 40.59	27.78 (0.00–1200.00) 40.67	28.12 (0.25–726.20) 40.41	0.8167
Average travel time to VA (minutes): mean (range) standard deviation (n = 3592)	43.76 (0.00–960.00) 38.46	43.28 (2.00–960.00) 39.39	45.02 (0.00–300.00) 35.94	0.2232
Patient perceptions of PCC constructs				
PAM (n = 3556) [mean (range) SD]	55.53 (0.00–100.00) 19.17	55.85 (0.00–100.00) 19.21	54.73 (0.00–100.00) 19.06	0.12
COMRADE				
Risk communication (n = 3218) [mean (range) SD]	56.14 (0.61–93.33) 17.65	56.29 (0.61–93.33) 17.53	55.76 (0.61–85.30) 17.95	0.44
Decision-making effectiveness (n = 3221) [mean (range) SD]	61.66 (15.54–90.80) 16.87	62.45 (15.67–90.80) 16.47	59.65 (15.54–87.44) 17.68	**< 0.0001** [‖]
CARE (n = 3568) [mean (range) SD]	38.62 (10.00–50.00) 11.07	39.13 (10.00–50.00) 10.74	37.31 (10.00–50.00) 11.78	**< 0.0001** [¶]
PACIC (n = 3466) [mean (range) SD]	3.08 (1.00–5.00) 1.12	3.08 (1.00–5.00) 1.11	3.09 (1.00–5.00) 1.14	0.92
Patient activation (n = 3430)	3.32 (1.00–5.00) 1.24	3.34 (1.00–5.00) 1.24	3.29 (1.00–5.00) 1.26	0.28
Delivery systems design (n = 3437)	3.44 (1.00–5.00) 1.16	3.46 (1.00–5.00) 1.14	3.40 (1.00–5.00) 1.20	0.15
Goal setting/Tailoring (n = 3429)	3.07 (1.00–5.00) 1.23	3.06 (1.00–5.00) 1.23	3.09 (1.00–5.00) 1.23	0.44
Problem solving/Contextual counseling (n = 3400)	3.25 (1.00–5.00) 1.30	3.26 (1.00–5.00) 1.29	3.23 (1.00–5.00) 1.31	0.56
Follow-up/Care coordination (n = 3413)	2.62 (1.00–5.00) 1.25	2.60 (1.00–5.00) 1.23	2.65 (1.00–5.00) 1.27	0.26
Press-Ganey (n = 3163) [mean (range) SD]	74.40 (0.00–100.00) 19.47	75.19 (0.00–100.00) 19.15	72.45 (0.00–100.00) 20.12	**< 0.001** [#]
GPE (n = 2811)				0.97
Successful	26.22	26.24	26.17	
Not successful	73.78	73.76	73.83	

[*] *Reference: Black/African American, Hispanic/Latino, Asian, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, other*
[†] *Reference: did not complete elementary school, elementary school, some high school, high school graduate, some college or technical school*
[‡] *Reference: member of an unmarried couple, separated/divorced, widowed, never married*
[§] *Reference: live: alone, with a family member/friend/spouse, other*
[‖] *Effect size (Hedge's g): 0.16*
[¶] *Effect size (Hedge's g): 0.16*
[#] *Effect size (Hedge's g): 0.13*

recent IP or ER encounter. We also found that individuals who received ≥ 1 instance of appropriate preventive care screening reported lower perceptions of empathy/holistic care, and participation, respect for choices and support. Our findings further indicated an inverse relationship between multiple positive health care quality indicators and perceptions of participation, respect for choices and support, and overall health care experiences. This indicates that the PREM scores used in this study may have identified several specific areas where targeted improvement efforts could be focused (e.g., increasing efforts at follow-up/care coordination; fostering empathic provider communication; improving patients' general health care experiences), and further underscores the value in using PREMs to evaluate facility performance and improve care delivery.

Table 4. Comparisons of Patient Perceptions of PCC Measures by Inpatient Utilization (IP) (No IP Encounters vs. at Least One IP Encounter) (*n* = 5512)

	Overall (*n* = 5512)	No IP encounters (*n* = 5063)	At least 1 IP encounter (*n* = 449)	*p* value
Demographics and patient characteristics				
Gender [Male] (*n* = 5495)	93.89	94.04	92.15	0.1111
Age (years): mean (range) standard deviation (*n* = 5425)	66.52 (23.00–100.00) 13.18	66.63 (23.00–100.00) 13.27	65.30 (30.00–96.00) 12.09	**0.0409**
Race/Ethnicity [White][*] (*n* = 5416)	67.54	68.43	57.40	**< 0.0001**
Education [College graduate][†] (*n* = 5491)	27.19	27.66	21.88	**0.0083**
Marital status [Married][‡] (*n* = 5479)	56.82	57.43	49.89	**0.0021**
Living arrangement [Live with formal caregiver][§] (*n* = 5475)	1.75	1.61	3.36	**0.0069**
Average distance from VA (miles): mean (range) standard deviation (*n* = 5512)	28.08 (0.00–2000.00) 49.15	27.60 (0.00–2000.00) 49.13	33.51 (0.25–700.00) 49.05	**0.0146**
Average travel time to VA (minutes): mean (range) standard deviation (*n* = 5387)	43.41 (0.00–960.00) 37.45	42.53 (2.00–420.00) 34.07	53.42 (0.00–960.00) 63.68	**< 0.0001**
Patient perceptions of PCC constructs				
PAM (*n* = 5331) [mean (range) SD]	56.21 (0.00–100.00) 19.47	56.48 (0.00–100.00) 19.39	53.20 (0.00–100.00) 20.10	**0.001**[‖]
COMRADE				
Risk communication (*n* = 4768) [mean (range) SD]	56.04 (0.61–93.33) 17.72	56.01 (0.61–93.33) 17.71	56.40 (0.61–85.30) 17.85	0.67
Decision-making effectiveness (*n* = 4771) [mean (range) SD]	61.24 (15.54–93.26) 17.12	61.30 (15.54–93.26) 17.07	60.58 (20.08–86.92) 17.65	0.42
CARE (*n* = 5322) [mean (range) SD]	38.47 (10.00–50.00) 11.18	38.57 (10.00–50.00) 11.11	37.35 (10.00–50.00) 11.85	**0.03**[¶]
PACIC (*n* = 5070) [mean (range) SD]	3.05 (1.00–5.00) 1.13	3.05 (1.00–5.00) 1.12	3.10 (1.00–5.00) 1.14	0.36
Patient activation (*n* = 5011)	3.31 (1.00–5.00) 1.25	3.32 (1.00–5.00) 1.25	3.26 (1.00–5.00) 1.24	0.37
Delivery systems design (*n* = 5021)	3.40 (1.00–5.00) 1.17	3.40 (1.00–5.00) 1.17	3.40 (1.00–5.00) 1.21	0.99
Goal setting/Tailoring (*n* = 5002)	3.03 (1.00–5.00) 1.24	3.03 (1.00–5.00) 1.24	3.07 (1.00–5.00) 1.19	0.46
Problem solving/Contextual counseling (*n* = 4967)	3.23 (1.00–5.00) 1.30	3.23 (1.00–5.00) 1.30	3.23 (1.00–5.00) 1.31	0.92
Follow-up/Care coordination (*n* = 4987)	2.56 (1.00–5.00) 1.25	2.55 (1.00–5.00) 1.25	2.73 (1.00–5.00) 1.28	**0.003**[#]
Press-Ganey (*n* = 4687) [mean (range) SD]	74.21 (0.00–100.00) 20.09	74.19 (0.00–100.00) 20.01	74.41 (0.00–100.00) 20.96	0.83
GPE (*n* = 4296)				0.28
Successful	25.56	25.35	27.99	
Not successful	74.44	74.65	72.01	

[*] *Reference: Black/African American, Hispanic/Latino, Asian, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, other*
[†] *Reference: did not complete elementary school, elementary school, some high school, high school graduate, some college or technical school*
[‡] *Reference: member of an unmarried couple, separated/divorced, widowed, never married*
[§] *Reference: live: alone, with a family member/friend/spouse, other*
[‖] *Effect size (Hedge's g): 0.17*
[¶] *Effect size (Hedge's g): 0.11*
[#] *Effect size (Hedge's g): −0.15*

Our findings are consistent with literature asserting that PREMs provide an accurate account of patient health care experiences and/or satisfaction, and may also shed light on their influence on both patient health outcomes, and health care quality and safety.[15,16,35] Study results suggest measures assessing distinct facets of PCC provide unique information about patient health care experiences, and, at the same time, share a pertinent link to common hospital performance measures. Additionally, the selected group of PREMs in this study (along with demographic factors) accounted for only a portion of the variation in multiple measures of health care quality, suggesting PREMs offer rich information about provider and

Table 5. Comparisons of Patient Perceptions of PCC Measures by ER Utilization (No ER Visits vs. at Least 1 ER Visits) ($n = 5512$)

	Overall ($n = 5512$)	No ER visits ($n = 4526$)	At least 1 ER visit ($n = 986$)	*p* value
Demographics and patient characteristics				
Gender [Male] ($n = 5495$)	93.89	94.79	89.70	**< 0.0001**
Age (years): mean (range) standard deviation ($n = 5425$)	66.52 (23.00–100.00) 13.18	67.30 (23.00–100.00) 13.11	62.94 (24.00–96.00) 12.90	**< 0.0001**
Race/Ethnicity [White][*] ($n = 5416$)	67.54	70.19	55.34	**< 0.0001**
Education [College Graduate][†] ($n = 5491$)	27.19	28.04	23.27	**0.0023**
Marital status [Married][‡] ($n = 5479$)	56.82	59.11	46.27	**< 0.0001**
Living arrangement [Live with formal caregiver][§] ($n = 5475$)	1.75	1.71	1.94	0.6291
Average distance from VA (miles): mean (range) standard deviation ($n = 5512$)	28.08 (0.00–2000.00) 49.15	28.36 (0.00–2000.00) 51.03	26.84 (0.13–726.20) 39.36	0.3788
Average travel time to VA (minutes): mean (range) standard deviation ($n = 5387$)	43.41 (0.00–960.00) 37.45	43.01 (0.00–960.00) 37.23	45.24 (3.00–480.00) 38.38	0.0939
Patient perceptions of PCC constructs				
PAM ($n = 5331$) [mean (range) SD]	56.21 (0.00–100.00) 19.47	56.57 (0.00–100.00) 19.33	54.58 (0.00–100.00) 20.03	**0.004**[‖]
COMRADE				
Risk communication ($n = 4768$) [mean (range) SD]	56.04 (0.61–93.33) 17.72	56.15 (0.61–93.33) 17.66	55.60 (0.61–91.97) 17.96	0.40
Decision-making effectiveness ($n = 4771$) [mean (range) SD]	61.24 (15.54–93.26) 17.12	61.58 (15.54–93.26) 16.95	59.75 (16.32–89.38) 17.75	**0.004**[¶]
CARE ($n = 5322$) [mean (range) SD]	38.47 (10.00–50.00) 11.18	38.81 (10.00–50.00) 10.99	36.91 (10.00–50.00) 11.87	**< 0.0001**[#]
PACIC ($n = 5070$) [mean (range) SD]	3.05 (1.00–5.00) 1.13	3.05 (1.00–5.00) 1.12	3.06 (1.00–5.00) 1.15	0.84
Patient activation ($n = 5011$)	3.31 (1.00–5.00) 1.25	3.33 (1.00–5.00) 1.25	3.24 (1.00–5.00) 1.26	*0.06*[**]
Delivery systems design ($n = 5021$)	3.40 (1.00–5.00) 1.17	3.41 (1.00–5.00) 1.16	3.36 (1.00–5.00) 1.21	0.22
Goal setting/Tailoring ($n = 5002$)	3.03 (1.00–5.00) 1.24	3.03 (1.00–5.00) 1.24	3.05 (1.00–5.00) 1.22	0.62
Problem solving/Contextual counseling ($n = 4967$)	3.23 (1.00–5.00) 1.30	3.24 (1.00–5.00) 1.29	3.17 (1.00–5.00) 1.33	0.15
Follow-up/Care coordination ($n = 4987$)	2.56 (1.00–5.00) 1.25	2.54 (1.00–5.00) 1.25	2.68 (1.00–5.00) 1.26	**0.002**[††]
Press-Ganey ($n = 4687$) [mean (range) SD]	74.21 (0.00–100.00) 20.09	74.66 (0.00–100.00) 19.76	72.26 (0.00–100.00) 21.38	**0.001**[‡‡]
GPE ($n = 4296$)				0.94
Successful	25.56	25.54	25.66	
Not successful	74.44	74.46	74.34	

[*]*Reference: Black/African American, Hispanic/Latino, Asian, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, other*
[†]*Reference: did not complete elementary school, elementary school, some high school, high school graduate, some college or technical school*
[‡]*Reference: member of an unmarried couple, separated/divorced, widowed, never married*
[§]*Reference: live: alone, with a family member/friend/spouse, other*
[‖]*Effect size (Hedge's g): 0.10*
[¶]*Effect size (Hedge's g): 0.10*
[#]*Effect size (Hedge's g): 0.17*
[**]*Effect size (Hedge's g): 0.07*
[††]*Effect size (Hedge's g): −0.11*
[‡‡]*Effect size (Hedge's g): 0.11*

hospital performance beyond what is accounted for by common performance metrics.

While patient-reported outcome measures (PROMs), which examine patient perceptions of their functioning/health, are being integrated into health care quality measurement,[36–38] our data suggest that PREMs offer additional insights that could also be integrated into these assessment processes. While this study provides an example of how PREMs measuring distinct facets of PCC can be integrated into performance measurement, the patient experience is a multi-faceted construct that can be assessed in various ways.[39] Validated PREMs could be integrated into the VA's ongoing quality assessment efforts, such as

Table 6. Multivariate Linear Regression: Variables Associated with a Patient Having Multiple Positive Health Care Quality Indicators[*][†] (*n* = 3040)

Covariates	Parameter Estimate	CI$_{95}$	*p* value
Gender (male) [ref: female]	0.04	−0.11–0.19	0.61
Age (continuous)	0.03	0.02–0.03	**< 0.0001**
Race/Ethnicity (white) [ref: black/African American, Hispanic, Asian, all other]	−0.01	−0.09–0.07	0.86
Education (college graduate) [ref: <12 years of education, high school graduate, some college]	−0.12	−0.20–−0.03	**0.01**
Marital status (married) [ref: member of a married couple, separated/divorced, never married, widowed]	0.12	0.04–0.19	**0.002**
Living arrangement (live with a formal caregiver) [ref: live alone, live with family/friend/spouse, other]	−0.50	−0.82– −0.18	**0.002**
Shared decision-making			
COMRADE risk-communication score (continuous)	−0.002	−0.01–0.001	0.20
COMRADE decision-making effectiveness score (continuous)	0.004	0.0004–0.01	**0.03**
Consultation and relational empathy (CARE score; continuous)	0.01	0.001–0.01	**0.02**
Chronic illness care (PACIC overall score; continuous)	0.03	−0.02–0.08	0.19
Participation, respect for choices & support (Press-Ganey score; continuous)	−0.003	−0.01–−0.0003	**0.03**
Global practice experience (proportion fully successful)	−0.10	−0.20–−0.01	**0.04**
[ref: proportion not fully successful]			
Patient activation (PAM score; continuous)	0.001	−0.001–0.004	0.22

*Dependent variable: number of positive health care quality indicators patients have simultaneously (continuous)
†Model R-square = 0.12

the Survey of Healthcare Experiences of Patients (SHEP). In particular, PREMs may fit nicely within the SHEP Patient Centered Medical Home (PCMH) Survey, which gathers monthly data from outpatient care users via the Consumer Assessment of Healthcare Providers and Systems PCMH survey,[40] and could be used to compare outcomes across facilities nationally. Including multiple PREMs that span the gamut of the patient experience in hospital performance measurement will provide important information about health care quality, and may be used to drive improvements in care.

Limitations

PCC construct data were collected via mailed survey, and may be subject to response and/or recall bias. The survey response rate was moderate (~35 %), which may limit generalizability of results. The study sample was mostly male Veteran users of VA care, which may affect generalizability to non-VA health care institutions. Results should not be taken to indicate that PREMs can replace concrete health care quality metrics. The magnitude of associations between PREM scores and positive health care quality indicators may not be clinically meaningful; for instance, literature suggests that a 4–6 point difference in PAM scores is clinically meaningful,[41] but it did not reach this magnitude in our data. The relationship between our PREMs and health care quality metrics were relatively weak, however, previous research reporting congruence between PREMs and health care quality/safety has also reported similarly weak positive associations.[35] These parallel findings indicate that PREMs provide important information regarding variation in hospital performance, but alone, do not provide a complete understanding of health care quality.

Conclusion

PREMs that measure PCC are a useful way for health care facilities to gather rich data regarding health care quality beyond typical performance metrics, while at the same time engaging patients and considering their preferences in the performance assessment process.

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