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Perceptions of Chronic Illness Care among Veterans with Multiple Chronic Conditions

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Keywords

chronic illness care; patient-centered care; patient-reported outcomes; quality improvement; Veterans

Introduction

The presence of multiple chronic conditions (MCC) requires regular and complex health care management and often leads to adverse impacts on health, function, and quality of life.[1] The increasing prevalence of MCC in the United States (US) continues to drive the escalation of health care costs, death, and disability.[2,3] In the Veterans Affairs (VA) Health Care System, the burden of MCC remains high compared with the general US population.[4,5] Prior literature has established that Veterans are more likely to have MCC and consequently experience poorer health status.[6,7] Over 30% of Veterans suffer from MCC, accounting for approximately two-thirds of total VA health care expenditures.[8] Limited, albeit growing, evidence exists around best practices for care of patients with MCC, who represent a diverse population with clinically complex needs.[9,10] Recent studies have highlighted the need to both optimize quality of care for patients with MCC and shift away from fragmented approaches focused on individual diseases.[11,12,13]

The Chronic Care Model (CCM) is an evidence-based framework to guide chronic care delivery.[14] The Model's cornerstones involve delivering care that (1) supports patient self-management, (2) is structured around integrated provider teams, and (3) incorporates clinical information systems to facilitate productive patient-provider relationships and, ultimately, enhance chronic care.[15] Implementation of the CCM has been found to improve patient

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outcomes and reduce health care costs.[16] The Patient Assessment of Chronic Illness Care (PACIC) is a proven, effective instrument that measures the alignment of chronic care with the CCM from the patient perspective.[17,18]

Research that includes patient-reported measures is needed to evaluate care for patients with MCC[19,20], yet limited literature exists in this area. In the VA, efforts are ongoing to implement a patient-centered model of care that engages patients and delivers high-quality care designed around individual needs and preferences.[21] Given the burden of MCC in the VA, understanding perspectives of Veterans with MCC is essential to evaluate chronic care and ensure that both care and quality improvement efforts align with patient needs. To our knowledge, use of the PACIC to evaluate quality of chronic care in the VA has not been explored among Veterans with MCC. The purpose of this study was to examine perceptions of chronic care among Veterans with MCC.

Methods

Study Design and Participants

We conducted a cross-sectional mailed survey of Veterans who have received care from eight VA health care facilities nationally. Facilities were located across the US, including the Northeastern/Mid-Atlantic, Southeastern, Southwestern and Western regions. During February and March 2013, we mailed to eligible participants: a cover letter describing the purpose of the study, a survey, and pre-paid VA business reply envelope. We conducted a follow-up mailing of the survey in May and June 2013 to Veterans who had not responded to the original mailing.

Inclusion criteria for this study were Veteran patients with MCC (defined as two or more chronic conditions) who had received health care from the eight VA facilities during the prior 6 months. We focused on exploring the relationship between PACIC scores and patient demographic characteristics, health care utilization, and number of chronic conditions.

This study was conducted as part of a larger quality improvement effort by VA health care facilities to evaluate patient-centered care using methods that explore patient perspectives.

Survey Measures and Data Sources

The survey included questions on patient demographics (age, sex, race, ethnicity, and education), recent hospital or doctor visits, and the PACIC instrument. The PACIC measures patient experiences with specific aspects of care congruent with the CCM. The instrument is a validated survey comprised of 20 questions organized into five subscales that address elements of the CCM that can be perceived by patients (Patient Activation, Delivery System Design/Decision Support, Goal Setting, Problem Solving/Contextual Counseling, and Follow-up/Coordination). Patients are asked to evaluate chronic care received over the last six months. PACIC items are scored on a 5-point Likert scale, where 1 = no/never and 5 = yes/always. The overall PACIC summary score is the average of all 20 items; subscales are scored by averaging the values of responses corresponding to each subscale. Scores range from 1 to 5 and are expressed as a decimal value. Higher scores indicate higher perceptions of care received in the last six months and greater alignment with the CCM.[22]

In addition, we extracted patient chronic condition and health care utilization data from VA administrative databases for a one-year period (October 1, 2012 – Sept 30, 2013) for all participants. In our assessment of MCC, we included the following chronic conditions: chronic obstructive pulmonary disease (COPD), diabetes, hypertension, rheumatoid arthritis, osteoarthritis, asthma, depression, ischemic heart disease, myocardial infarction, dementia, stroke, and cancer. These chronic diseases were selected based on a compilation of prevalent chronic conditions resulting in high health care cost in the United States from the Agency for Healthcare Research and Quality (AHRQ) and the Centers for Medicare and Medicaid Services (CMS).[23] We used ICD-9 codes to identify these chronic conditions based on the AHRQ Clinical Classification System. Patients with diagnosis codes for two or more of these chronic conditions during the one-year time period were defined as patients with MCC. Health care utilization included number of inpatient discharges, emergency room visits, outpatient visits, 24-hour observation stays, and length of hospital stay.

Statistical Analysis

All analyses were conducted using SAS software version 9.3 (SAS Institute Inc., Cary, NC). We used descriptive statistics to characterize the overall sample. Bivariate statistics, including chi-square tests for categorical variables and the Student's t-test for continuous variables, were used to compare mean PACIC scores across patient demographic factors, health care utilization, and number of chronic conditions. A t-test comparing mean overall PACIC scores by each of the sample characteristics was conducted; we considered a p-value less than or equal to .05 to be statistically significant.

We used a multivariate logistic regression model to produce odds ratios and 95% confidence intervals to determine variables associated with high overall PACIC scores and high levels of concordance with the CCM. Using the analytic approach successfully used by Jackson and colleagues, we categorized overall PACIC scores of 3.5 or higher (the top quarter of the PACIC scale) as fully implemented elements of the CCM ; scores of 3.4 or less were considered to represent care that did not fully implement CCM elements. This is similar to prior studies that describe dichotomizing the PACIC scale to explore higher scores (denoting “high quality” care) and lower scores (signifying “medium to low quality” care).[27,28] The final model examined variables independently associated with high PACIC scores and concordance with the CCM, where higher overall PACIC scores represented the dependent variable (ie. ≥3.5 vs. ≤3.4). Independent variables included were those significantly associated with higher PACIC scores in the bivariate analysis with p-value less than or equal to .05; these included white race (vs. non-white), Hispanic ethnicity (vs. non-Hispanic), high school education or less (vs. some college or greater), and recent VA doctor or hospital visit in the last six months (vs. non-VA doctor or hospital visit and no doctor or hospital visits in the last six months). To address potential risk of multicollinearity, we generated a correlation matrix to ensure that a strong relationship did not exist between the independent variables in our final model. The model excluded 180 respondents due to missing survey responses or values.

Results

Of the 16,425 Veteran patients to whom surveys were mailed, 674 surveys were undeliverable, 77 patients had died, and 45 were returned unopened or indicated as 'not applicable', leaving 15,629 Veterans. The survey was completed by 5,507 Veteran patients (35.2% response rate). Of these 5,507 respondents, 3,519 Veterans had MCC (based on VA administrative data) and had complete survey data. These Veterans were included in the final analyses.

Sample characteristics are presented in Table 1. The average age within our sample was 68.1 years (SD = 11.6), and a majority of respondents were male (95.0%). Approximately 75.6% of respondents reported white race. Nearly 32.0% had completed only high school or less than 12 years of education. On average, respondents lived nearly 45 minutes away from their VA health care facility, (SD = 35.4). Mean number of chronic conditions was 3.04 (SD =1.17), ranging from two to eight chronic conditions; and respondents had 21 outpatient visits on average (SD = 22.7). Approximately 76% of respondents reported that they had seen a VA doctor or visited a VA health care facility in the six month period preceding receipt of the survey (from August 2012 – February 2013).

Overall PACIC scores and associations between PACIC scores and patient demographic factors, health care utilization, and number of chronic conditions are shown in Table 2. The mean PACIC summary score for the entire sample was 3.05 (SD = 1.12). Overall, respondents achieved higher scores in the Delivery System Design/Decision Support subscale (3.40, SD = 1.17) and the Patient Activation subscale (3.29, SD = 1.25); lowest scores were achieved in the Follow-up/Coordination subscale (2.60, SD = 1.24). Patient characteristics that were significantly associated with higher overall PACIC scores included non-white race (3.17 vs. 3.00; $p < 0.0001$), Hispanic ethnicity (3.23 vs. 3.03; $p = 0.002$), high school or less education (3.14 vs. 3.01; $p = 0.002$), and recent VA doctor or hospital visit in the preceding six months (3.10 vs. 2.92; $p < .0001$). Additionally, these characteristics increased all PACIC subscale scores in our sample. Patient characteristics that were not associated with significant differences in PACIC scores included age, number of chronic conditions, inpatient discharges, 24-hour observation stays, emergency room visits, and length of stay. Although higher overall PACIC scores were generally achieved by male Veterans compared to female Veterans (3.06 vs. 2.93; $p = 0.15$) and respondents with at least one or more outpatient visit compared to no outpatient visits (3.06 vs. 2.86; $p = 0.20$), these findings were not statistically significant. Overall PACIC scores did not differ significantly across facilities.

Results of the multivariate logistic regression analysis are presented in Table 3. Except for Hispanic ethnicity, all variables included in the model showed some statistically significant association with overall PACIC scores. We found that Veterans who reported non-white race were more likely to achieve a PACIC score of 3.5 or higher, as compared with those reporting white race (OR = 1.19; 95% CI 1.00 - 1.40). Veterans who reported a recent doctor or hospital visit in the last six months at a VA health care facility were also more likely to achieve PACIC scores of 3.5 or higher, compared to those with no or non-VA recent doctor or hospital visits in the last six months. Compared to Veterans with a high school or less

education, Veterans reporting at least some college education were less likely to obtain higher PACIC scores (OR = 0.82, 95% CI 0.71 - 0.95). Although Hispanic Veterans were more likely to obtain higher PACIC scores than non-Hispanic Veterans (OR = 1.19; 95% CI 0.92 - 1.54), this was not significantly associated ($p > .05$) with higher PACIC scores in the regression analysis.

Discussion

The frequent co-occurrence of chronic conditions presents substantial challenges in delivering high-quality health care.[12] This burden has been markedly higher in the Veteran community.[7,8] Recent studies have demonstrated that comprehensive, patient-centered strategies that go beyond traditional, disease-based frameworks are needed to improve care for patients with MCC.[29] A critical step in developing these care strategies is characterizing the complex needs and preferences of patients with MCC.[30] In the present study, we focused on this key area, presenting data that can be used to enhance care for this population and better align with patient needs.

Our application of the PACIC instrument harnessed the patient perspective by exploring elements of the CCM that could be perceived by patients. Perceptions of care among Veterans with MCC in this sample are generally high; however several areas for improvement currently exist in order to fully achieve CCM-concordant care and increase patient ratings of care. We learned that PACIC scores were highest in the Delivery System Design/Decision Support subscale, indicating that Veterans perceive care to be organized and receive the information needed to enhance their understanding of care. High scores in the Patient Activation subscale suggest that Veterans with MCC are generally active patients who feel that their input is solicited by providers during treatment decision making. Lowest PACIC subscale scores were found in the area of Follow-up/Coordination, suggesting a need for improved continuity of care and efforts to proactively engage patients in assessments of care and its coordination. We learned that patient characteristics significantly associated with higher PACIC scores included non-white race, recent VA hospital or doctor visit, and high school or less education. Results from these patient-reported measures contribute to the existing knowledge base around perceptions of care among Veterans with MCC.

Improving quality of care for patients with MCC requires care coordination across multidisciplinary care teams, informed patients, and shared decision making.[19] Data from this study can be incorporated into such targeted quality improvement efforts that may help in delivering care for patients with MCC that better correspond with the CCM and patient needs.

Overall PACIC scores within this sample of Veterans patients with MCC were similar to PACIC scores studied in other chronic conditions among non-Veteran populations.[22,31] Similar to prior studies[32], our data suggest that recent and direct patient-provider interactions may play an important role in patient perception of care, and present an area where quality improvements and behavioral interventions can be focused to improve patient experiences.

Prior literature has shown that chronic care should be tailored around local needs and contexts[33]; this may be particularly relevant to VA quality improvement efforts. In this study, Veterans with MCC who were non-white and had twelve years or fewer years of education reported higher perceptions of chronic care compared to those who were white and had at least some college-level education. While contrary to prior PACIC studies,[16,32] this finding is corroborated by a study of Veterans with diabetes in which non-white patients with less than high school education obtained significantly higher PACIC scores and reported receiving care that was better aligned with the CCM.[24] A possible explanation for this finding, as noted by Jackson and colleagues, is perhaps that VA health care is designed to be sensitive to the needs of non-white Veterans and those with less education, given their overrepresentation in the Veteran community. Given the VA's ongoing transformation toward high-quality, patient-centered care, these findings indicate a need to better understand perceptions of care that may be specific to Veterans.

To our knowledge, this is the first study describing the use the PACIC at VA facilities nationally to characterize perceptions of chronic care among Veterans with MCC. The large sample size allowed for greater statistical power to explore perceptions of chronic care and possible links with several important variables. Several study limitations should be noted, however. Our survey response rate was significantly lower than expected and may not represent the greater Veteran population with MCC. Furthermore, Veterans represent a population that is generally poorer, older, and less educated compared to the American population overall.[34] Thus, these data may not be generalizable to the overall American population suffering from MCC. Moreover, dichotomizing the PACIC scale into a categorical outcome variable for our analyses may have increased the risk of bias from regression to the mean. Additionally, the cross-sectional study design allowed us to describe patient perceptions at a given point of time only and did not allow us to draw causal inferences with regard to PACIC scores and MCC patient outcomes. Finally, survey data were self-reported and may have presented additional limitations.

As the VA continues its mission to deliver care that is integrated and patient-centered, it will be important for researchers and clinicians to identify quality improvement strategies to (1) enhance follow-up and continuity of care for Veteran patients with MCC and also to (2) better engage these patients as partners with providers in chronic care delivery. Qualitative studies that examine perceptions of chronic care among Veterans with MCC, including underlying views around patient activation and goals, and self-management needs, will be beneficial in tailoring patient care and facilitating productive patient-provider relationships. Additional prospective studies are also needed to explore PACIC scores over time among Veterans with prevalent combinations of MCC, as well as possible associations with patient or chronic disease characteristics that may be unique to the Veteran community.

Conclusions

Improving the quality of chronic care requires a comprehensive understanding of patient perceptions. In this sample of Veterans with MCC, patient-reported perceptions of chronic care in the VA were high; however, several areas were identified where quality improvement efforts may be beneficial. We found that (1) Veterans with MCC are generally active patients

who feel their input is solicited by providers during treatment decision making, (2) a need exists to improve continuity of care and efforts to engage patients in care assessments and coordination, and that (3) patient characteristics associated with higher PACIC scores included non-white race, recent VA hospital or doctor visit, and high school or less education. This builds upon existing knowledge of patient perspectives of chronic care. Furthermore, these findings can be incorporated into behavioral interventions and quality improvement strategies that aim to provide care that best resonates with Veterans with MCC and addresses the burden of MCC in the VA.

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Table 1
Sample Characteristics of patients with at least 2 chronic conditions

Characteristic	Mean (SD) or Percent
Age (n = 3462)	
mean (range, standard deviation)	68.1 (26 - 98, SD=11.6)
Sex (n = 3508)	
Male	95.04
Female	4.96
Race (n = 3423)	
White	75.58
Black	21.41
Asian	1.46
Hawaiian/Pacific Islander	0.53
American Indian/Alaskan	0.93
Other	0.09
Ethnicity (n = 3390)	
Hispanic	10.06
Non-Hispanic	89.94
Education (n = 3504)	
Less than 12 years	8.42
12 years or equivalent	23.40
Some College	43.49
College Graduate	24.69
Average distance from VA (miles) (n = 3519)	
mean (range, standard deviation)	29.0 (0.13 - 2000, SD=53.4)
Average travel time to VA (minutes) (n = 3444)	
mean (range, standard deviation)	44.45 (0 - 360, SD=35.4)
Recent doctor or hospital visits in last 6 months (n = 3519)	
Yes, VA	76.39
Yes, non-VA	27.54
No	5.34
Number of chronic conditions [a] **(n = 3519)**	
mean (range, standard deviation)	3.04 (2 - 8, SD=1.17)
Number of inpatient discharges (n = 3519)	
mean (range, standard deviation)	0.17 (0 - 8, SD=0.60)
Length of stay [b] **(n = 375)**	
Mean (range, standard deviation)	9.49 (1 - 121, SD=14.1)
Number of 24-hour observation stays (n = 3519)	
mean (range, standard deviation)	0.03 (0 - 4, SD=0.21)
Emergency room visits (n = 3519)	
mean (range, standard deviation)	0.43 (0 - 22, SD=1.19)
Outpatient visits (n = 3519)	

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Characteristic	Mean (SD) or Percent
mean (range, standard deviation)	21.1 (0 - 234, SD=22.7)

[a] Among those with at least two chronic conditions.

[b] Among those who had an inpatient discharge.

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Table 2

PACIC subscale and overall scores by sample characteristics

Characteristic [Mean (SD)]	PACIC Subscales					Overall PACIC Score (n = 3519)	p-value [c]
	Patient Activation (n = 3480)	Delivery System Design/ Decision Support (n = 3490)	Goal Setting/ Tailoring (n = 3481)	Problem Solving/ Contextual Counseling (n = 3452)	Follow-up/ Coordination (n = 3470)		
Entire study sample	3.29 (1.25)	3.40 (1.17)	3.03 (1.24)	3.22 (1.30)	2.60 (1.24)	3.05 (1.12)	N/A
Age (n = 3462)							0.45
18 - 64 yrs	3.28 (1.27)	3.39 (1.21)	3.11 (1.23)	3.20 (1.32)	2.63 (1.28)	3.07 (1.16)	
64 yrs and above	3.30 (1.23)	3.40 (1.14)	2.98 (1.22)	3.24 (1.28)	2.58 (1.22)	3.04 (1.10)	
Sex (n = 3508)							0.15
Female	3.20 (1.34)	3.19 (1.32)	2.92 (1.40)	3.07 (1.44)	2.53 (1.33)	2.93 (1.26)	
Male	3.30 (1.24)	3.41 (1.16)	3.03 (1.23)	3.23 (1.29)	2.60 (1.24)	3.06 (1.12)	
Race (n = 3423)							**<0.0001**
White	3.29 (1.24)	3.36 (1.15)	2.95 (1.22)	3.18 (1.29)	2.52 (1.21)	3.00 (1.11)	
Other	3.30 (1.27)	3.48 (1.19)	3.20 (1.25)	3.32 (1.31)	2.76 (1.30)	3.17 (1.15)	
Ethnicity (n = 3390)							**0.002**
Hispanic	3.30 (1.27)	3.53 (1.15)	3.25 (1.24)	3.37 (1.30)	2.88 (1.31)	3.23 (1.15)	
Non-Hispanic	3.29 (1.24)	3.38 (1.17)	3.00 (1.23)	3.21 (1.29)	2.56 (1.23)	3.03 (1.11)	
Education (n = 3504)							**0.002**
High school or less	3.31 (1.24)	3.47 (1.16)	3.12 (1.23)	3.33 (1.29)	2.71 (1.28)	3.14 (1.12)	
Some college or higher	3.28 (1.25)	3.36 (1.17)	2.99 (1.24)	3.18 (1.30)	2.54 (1.23)	3.01 (1.12)	
Recent doctor or hospital visits in last 6 months (n = 3519)							
Yes, VA	3.35 (1.22)	3.43 (1.16)	3.08 (1.22)	3.27 (1.29)	2.64 (1.25)	3.10 (1.12)	**<0.0001**
Yes, non-VA	3.18 (1.27)	3.21 (1.18)	2.83 (1.23)	3.06 (1.30)	2.39 (1.15)	2.87 (1.10)	**<0.0001**
No	2.96 (1.36)	3.16 (1.32)	2.72 (1.30)	2.97 (1.38)	2.42 (1.27)	2.82 (1.22)	**0.003**
Number of Chronic Conditions (n = 3519)							0.633
2	3.34 (1.24)	3.39(1.19)	3.01 (1.23)	3.23 (1.30)	2.53 (1.24)	3.04 (1.12)	
≥3	3.27 (1.25)	3.40 (1.16)	3.04 (1.24)	3.22 (1.30)	2.64 (1.25)	3.06 (1.13)	
Inpatient discharges (n = 3519)							0.395
None	3.30 (1.25)	3.40 (1.17)	3.03 (1.24)	3.22 (1.30)	2.58 (1.24)	3.05 (1.12)	

Characteristic [Mean (SD)]	PACIC Subscales					Overall PACIC Score (n = 3519)	p-value [c]
	Patient Activation (n = 3480)	Delivery System Design/ Decision Support (n = 3490)	Goal Setting/ Tailoring (n = 3481)	Problem Solving/ Contextual Counseling (n = 3452)	Follow-up/ Coordination (n = 3470)		
≥1	3.24 (1.24)	3.49 (1.22)	3.07 (1.19)	3.23 (1.31)	2.77 (1.28)	3.10 (1.14)	
Length of stay (n = 375)							0.704
1 - 10 days	3.29 (1.25)	3.40 (1.17)	3.03 (1.24)	3.23 (1.30)	2.59 (1.25)	3.05 (1.12)	
≥10 days	3.27 (1.27)	3.37 (1.22)	3.05 (1.22)	3.20 (1.33)	2.75 (1.20)	3.10 (1.14)	
24-hour observation stays (n = 3519)							0.455
None	3.30 (1.24)	3.40 (1.17)	3.03 (1.24)	3.23 (1.29)	2.60 (1.25)	3.06 (1.12)	
≥1	2.92 (1.27)	3.27 (1.30)	2.96 (1.21)	3.12 (1.44)	2.71 (1.23)	2.97 (1.19)	
Emergency room visits (n = 3519)							0.499
None	3.30 (1.24)	3.40 (1.16)	3.02 (1.24)	3.23 (1.29)	2.56 (1.24)	3.05 (1.12)	
≥1	3.25 (1.26)	3.37 (1.21)	3.06 (1.22)	3.21 (1.33)	2.73 (1.26)	3.08 (1.15)	
Outpatient visits (n = 3519)							0.197
None	3.05 (1.31)	3.27 (1.36)	2.93 (1.27)	3.05 (1.32)	2.31 (1.26)	2.86 (1.17)	
≥1	3.30 (1.25)	3.40 (1.17)	3.03 (1.24)	3.23 (1.30)	2.30 (1.24)	3.06 (1.12)	

[c] p-value for t-test comparing overall PACIC scores by sample characteristics dichotomized/categorized as described in table.

Table 3
Variables associated with higher PACIC scores (multivariate logistic regression)

Variables	Odds Ratio (OR)	95% CI	p-value
Race			
Nonwhite race (vs white)	1.19	1.002 - 1.403	0.047
Ethnicity			
Hispanic (vs non-Hispanic)	1.19	0.915 - 1.535	0.198
Education			
Completed some college or higher (vs high school or less)	0.82	0.706 - 0.953	0.009
Recent doctor or hospital visits in last 6 months			
Yes, VA (vs everyone else)	1.30	1.095 - 1.533	0.003

[d]PACIC scores were dichotomized for this analysis; scores of 3.5 or higher were defined as higher scores and 3.4 or less were defined as lower scores.