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RESEARCH ARTICLE

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Organizational and patient factors associated with positive primary care experiences for veterans with current or recent homelessness

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Abstract

Objective: To identify organizational service features associated with positive patient ratings of primary care within primary care clinics tailored to accommodate persons with ongoing and recent experiences of homelessness (PEH).

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Analyses related to this paper have been presented at the Society of General Internal Medicine conference (poster, April, 2022), the 15th Annual Conference on the Science of Dissemination and Implementation (D&I) (poster, December, 2022), and the National Health Care for the Homeless and Policy Symposium (workshop in May, 2022).

Data Sources and Study Setting: PEH receiving primary care in 29 United States Veterans Health Administration homeless-tailored clinics were surveyed about their primary care experience using the validated Primary Care Quality-Homeless (PCQ-H) survey. Characteristics of the clinics were assessed through surveys of clinic staff using a new organizational survey developed through literature review, site visits, statistical analysis, and consensus deliberation.

Study Design: Cross-sectional examination of patients' ratings of care based on surveys of patients, and of clinic characteristics, analyzed with Classification and Regression Tree (CART) analysis, a form of machine learning.

Data Collection Methods: Patient surveys ($n = 3394$) were obtained from a random sample of enrolled patients by both mail and telephone by an external survey contractor. Staff ($n = 52$ from 29 clinics) were interviewed by telephone.

Principal Findings: This analysis identified service features that impact patient experience favorably, including aspects of patient-centeredness, team identity, strong external leadership support, and service that reach beyond traditional primary care clinic confines. Results varied according to the patient experience scale analyzed. Individual characteristics of PEH, such as degree of social support, general health, and unsheltered status, were also correlated with how they rate care.

Conclusions: Organizational characteristics correlate with ratings of primary care from patients with recent and ongoing homelessness. Primary care programs serving homeless individuals can assure better care based on who they hire, how they foster team identity, what services they provide, and the strength of leadership support to protect a homeless-focused mission.

KEYWORDS
homeless persons, machine learning, organizational research, primary care

What is known on this topic

- Tailoring of primary care service for persons experiencing homelessness often includes more generous staff-to-patient ratios, outreach, social service colocation as well as institutional and leadership support for a homeless-focused mission.
- Over 900 US-based Health Care for the Homeless programs vary in the degree to which they tailor primary care services for persons experiencing homelessness.
- Although homeless-tailored primary care programs outperform mainstream programs in some respects, there is no consensus as to what service design features most enhance patient experiences in care.

What this study adds

- This paper details the first large, multisite study to profile key features of homeless-tailored primary care using both survey data and machine learning.
- This study identifies service features that impact patient experience favorably, including aspects of patient-centeredness, team identity, strong external leadership support, and service that reach beyond traditional primary care clinic confines.
- The study data also draw attention to patient characteristics that correlate with how they rate their care, including patients' social support, general health status, and recent unsheltered experience.

1 | INTRODUCTION

Homelessness in the United States rose from 2016 to 2023.[1] The mortality of homeless and formerly homeless persons is high,[2,3] as is the risk of eviction or return to homelessness.[4,5] Since persons who experience homelessness (PEH) often have poor health, effective primary care models could enhance health and ideally avert a return to homelessness once housed. However, the service characteristics necessary to optimize care for this vulnerable population remain poorly defined and difficult to study.

In theory, primary care services should match ideals for primary care first laid out by the Institute of Medicine in 1996,[6] and by others.[7–9] These include offering a timely first point of contact, responsiveness to the whole person, connections to necessary health services, trust, and continuity.[6] These ideals often prove elusive for populations with social vulnerabilities, medical and psychological comorbidities, disability, minority status, poverty, and stigmatic burdens,[10] characteristics common among PEH.

Systematic efforts to deliver primary care to PEH began in the 1980s through Health Care for the Homeless grants from the Robert Wood Johnson Foundation.[11] The US Department of Health and Human Services (DHHS) assumed responsibility for these programs in 1987. Many of the early Health Care for the Homeless programs tailored the design and delivery of services to overcome unique challenges to care, such as sleeping conditions, competing needs, trauma, or feeling unwelcome.[12,13] Later, in 2012, the US Department of Veterans Affairs (VA) launched its own Homeless Patient-Aligned Care Teams (H-PACTs) to tailor primary care for Veterans with homeless experience, drawing on the example provided by some Health Care for the Homeless programs.[14,15] Despite this history, there is no consensus or statutory mandate as to what primary care tailoring for homeless populations must include. In fact, the 1996 consolidation of DHHS's Health Care for the Homeless programs under the same regulatory framework as all community health centers[16] likely hindered efforts to identify benefits of homeless-tailored primary care programs.

Despite ambiguity as to tailoring's definition, homeless-tailored models tend to outperform mainstream, non-tailored clinics serving PEH on some measures.[17–19] Compared to PEH in mainstream clinics, those in tailored programs offer superior care ratings,[17,18] notably on elements definitional to primary care such as integration, transparency, coordination, continuity, and responsiveness.[20–23] Comparisons on emergency service use hint at some benefit but are inconsistent.[24,25]

It remains unclear which service features (if any) account for the superior ratings of tailored primary care. One review of 19 studies proposed 33 components of tailored primary care potentially relevant for PEH. These included (a) aspects of how primary care agencies were organized (e.g., multidisciplinary), (b) models for how care should be done (e.g., that it be coordinated, comprehensive, offer patient education); (c) tools to enhance care, such as electronic records; (d) provision of nonmedical services; and (e) "access to care," which included easy walk-in care, outreach, clinic friendliness and more.[12]

Given so many components, comparisons of just a few clinics (i.e., "tailored" versus "mainstream")[18,25] cannot isolate **which** service components matter. By contrast, research incorporating many clinics permits correlative examination of service characteristics and their outcomes.[26] In non-homeless primary care research, medical group and patient characteristics have been examined through hierarchical models.[27] Hierarchical models, however, impose parametric assumptions and present challenges of interpretability when a large number of predictors are considered.

In this study, we sought to identify which organizational service features correlated with positive patient ratings across a large number of the VA's Homeless Patient-Aligned Care Teams (H-PACTs), with the objective of informing VA and DHHS programs alike.

We focused on patient ratings because patients can report directly on whether care approximates attributes defined by the Institute of Medicine in 1996,[6] and because patients with experiences of homelessness often report inferior care.[28,29] Some evidence also suggests that better ratings predict better care engagement, adherence, and outcomes.[30,31]

We hypothesized that homeless-tailored organizational features suggested by the literature,[32] by guidelines,[33] and by prior research on tailored primary care[14,15] would be associated with better ratings of care. As part of this study, we also considered patient characteristics that can affect care ratings.

2 | METHODS

This study correlates results from a survey of PEH (patient survey) with a survey of providers at 29 H-PACTs serving those PEH at 26 VA facilities (organizational survey). All aspects of this study were approved by the VA Central Institutional Review Board.

2.1 | Populations Surveyed

The **patient survey** assessed characteristics of Veteran PEH and their ratings of primary care. Veterans were eligible if they had evidence of homelessness[34] in VA records in the 30 months prior to November, 2017 (qualifying as PEH, diagnostic codes shown in eTable 2), had attended ≥2 primary care visits at the same VA clinic site, and were assigned specifically to an H-PACT. The 2-visit criterion reflects use of a homeless-focused survey developed for persons evaluating an ongoing clinic relationship, rather than a visit.[35] At the time the survey sample was compiled, there were 53 VA Medical Centers with H-PACTs. We limited our study to patients attending the 29 largest H-PACTs to assure a statistically adequate number of respondents to allow site comparisons. Additional details on study design and survey administration are reported elsewhere.[36] The survey, conducted from March 2018 through October 2018, achieved a 40.2% response rate. Veterans completing the questionnaire received a thank-you letter and a $10 prepaid debit card.

The **organizational survey** sought the perspectives of two interviewees at each of the 29 H-PACTs where Veteran PEH were surveyed, including the lead nurse and the prescribing clinician (physician, nurse practitioner, or physician assistant). To obtain participation, we used email and VA internal instant messaging and telephone outreach; VA rules prohibited compensation of staff for participation, which prolonged survey collection from April 1, 2018 through April 30, 2019. This approach resulted in 52 study participants among 58 approached (response rate = 90%). Where two H-PACT staff respondents disagreed on a scale item, their responses were averaged. For non-scale items, standard rules for adjudication were developed by our multidisciplinary team, usually defaulting to the less favorable response. These surveys were conducted by telephone.

2.2 | Patient survey measures for experience of care and covariates

Central to the patient survey was a 33-item instrument developed to assess the primary care concerns of homeless-experienced populations, the Primary Care Quality-Homeless (PCQ-H).[18,35,37,38] The PCQ-H, published in 2014, was developed through a combination of interviews, administration to patients across the country, and item response theory.[39] The resultant scales are based on 4-point Likert items (Strongly Disagree to Strongly Agree, counted as 1–4) and include Patient-clinician relationship ("Relationship," 15 items); Cooperation among clinicians ("Cooperation," 3 items), Accessibility and coordination ("Access/Coordination," 11 items), and Homeless-specific needs (4 items). A mean scale score is calculable as the average of item responses if 50% of items within that scale have valid responses. An overall "Mean-of-Domains" is the average of the scores from each of the four PCQ-H scales (termed "Overall" below). All items are shown in eTable 3.

Patient characteristics that might influence ratings of care were selected from among variables in the Behavioral Model for Vulnerable Population[40] that have previously been found to be significant predictors of care ratings in similar surveys[18,38]; these were categorized as *predisposing*, *enabling/impeding*, and *need*. There were 17 such patient-level variables.

Predisposing factors included age, gender, race, and Hispanic/Latino ethnicity. These were derived by self-report, with the following exception. Race information was added from VA medical records when the self-reported race was left blank or uninformative, which occurred in 462 of 3394 respondents, or 8%. However, even after checking VA records, race remained unassigned for 39 persons (1.1%).

Enabling/impeding factors included unsheltered homelessness (one or more nights spent outside or in a place not meant for sleeping in the prior 6 months), chronic homelessness (four or more episodes in 3 years, or >1 year for the longest episode), and low income (<$1000/month). The six-item social support scale combined four "Emotional Support" items from the National Institutes of Health Patient-Reported Outcomes Measurement Information System, one item from its Social Isolation scale,[41] and one item measuring the ability to borrow $20 (combined scale Cronbach's $\alpha = 0.84$).

Need characteristics included eight self-reported medical conditions.[42] Psychological distress was based on four depression/anxiety items from the Patient Health Questionnaire-4[43] and two psychotic symptoms from the Colorado Mental Health Symptom Index (range 0–24, combined Cronbach's $\alpha = 0.84$).[44,45] To assist interpretability, psychological distress was dichotomized at ≥10 for "severe," which would be attained by reporting five of six symptoms "several days" a week. We also assessed current alcohol or drug problems on a validated screener,[46] receipt of psychiatric medication,[47] and chronic pain of a severe nature. Severe chronic pain was assessed with one item from the Brief Chronic Pain Questionnaire focused on presence of pain for at least three months[48,49] coupled with *current* pain severity at ≥7 of 10.

2.3 | Organizational survey: Homeless-focused primary care OrGanizational Evaluation (HOGE Survey)

Primary care organizational assessment measures have not previously been developed for homeless-tailored primary care. For this study, our team crafted a new organizational assessment, termed the Homeless-focused primary care OrGanizational Evaluation (HOGE) survey.

Domains and items of interest for the HOGE survey were initially selected through cross-referencing several sources, including (a) keystone literature on primary care, such as reports from the National Academy of Medicine,[50,51] (b) prior conceptualizations of homeless-tailored care,[18,52] (c) comparison to patient-centered medical home assessments,[53,54] (d) a checklist used by VA H-PACT leadership,[14] and (e) a prior dissertation on homeless health care by one team member.[55] These led to a preliminary organizational item set.

To revise and reduce the draft item set, qualitative interviews were conducted through in-person site visits to two non-VA Health Care for the Homeless Programs and three VA H-PACTS ($n = 57$ interviews). Site visit teams included one or more health services researchers, an experienced homeless health care clinician, a medical sociologist, and a research methodologist. All visits were debriefed orally and in writing. Team members then were then asked to edit the previously drafted items and propose new ones based on site visit impressions. After consensus review, 132 items were administered to H-PACT staff at the 29 selected sites via telephone interviews carried out from April 1, 2018 through April 30, 2019. Following administration of the 132 items to H-PACT staff, 54 items were removed after reviewing the response variability and internal reliability (Cronbach α's) of proposed scales.

Among the 78 HOGE items that were retained, 39 had Likert-type responses (agreement to disagreement) that aligned with five hypothesized scales: Access, Coordination, Accommodation/Patient-Centeredness, Staff and Team Dynamics, and Leadership Support.

Cronback α's for these scales were of variable strength, with one falling well below the typical criteria for reliability (0.81 for Teamness, 0.74 for Leadership, 0.72 for Coordination, 0.68 for Patient-Centeredness, and 0.58 for Access).

Another 39 consensus-endorsed items assessed presence or absence of a particular service arrangement, or they allowed a Likert-type response that did not align with hypothesized scales. These items fell into groups designated as Intraorganizational Networks and Communication, Performance and Quality Improvement, and Outer Setting Characteristics. These 39 were termed "inventories" to distinguish them from the scales. All Scales and Inventories are summarized in Table 2 and detailed in eTable 4.

2.4 | Statistical approach: Correlating organizational and patient characteristics with ratings of care

To analyze whether H-PACTs' organizational features influenced care ratings, statistical analyses treated patient-reported PCQ-H scale scores as dependent variables in five separate Classification and Regression Trees (CART) models, one for the overall PCQ-H Mean-of-Domains and one for each PCQ-H subscale. CART models can sometimes be advantageous because they offer a way to identify important subgroups and to consider a large number of potentially relevant variables, and their interactions, without imposing assumptions up front.[56,57] A CART model splits the dependent variable values (here, patient ratings) into groups ("nodes" in the tree) based on evaluation of all potential explanatory variables, with the objective of maximizing homogeneity of data within each node. The resulting "tree" is hierarchical. A variable emerging "higher" in a tree has more partitioning power. This means that it plays a role in differentiating scores for a greater percentage of respondents compared to variables in nodes lower down in the tree. The model retains those explanatory variables most helpful in splitting data into homogeneous nodes and handles multicollinearity by retaining only the "best splitters." This analysis was conducted among respondents for whom the five PCQ-H scores (mean-of-domains and the scale scores) could be calculated. By design a CART model does accommodate missing values for covariates used in the tree; the number missing for each variable are laid out in eTable 5.

For each CART model, we entered all 5 HOGE organizational scales, all 39 HOGE inventory items, and the 17 patient-level characteristics. By design, our models removed variables failing to partition ≥30 respondents. As a result, the final CART models do not include variables lacking at least modest partitioning power. Model performance was assessed through computation of Pearson's correlation between CART-model-predicted values and the observed outcomes for each respondent All analyses were conducted in R.

3 | RESULTS

We obtained 3394 responses from PEH who used H-PACTs for primary care, along with responses from 29 clinics, as profiled in Table 1. Among PEH, 2788 had sufficient data to permit a Mean-of-Domains computation (for subscales, the *N*'s were 3323, 2949, 3305, and 3122 for Relationship, Cooperation, Accessibility/Coordination, and Homeless-Specific Needs, respectively). Those with a computable Mean-of-Domains differed from the 606 without a computable mean on some variables (eTable 5). For example, those with a computable Mean-of-Domains were older (58.1 vs. 56.9 years) and more likely to endorse four or more of the six types of social support queried (62.1% vs. 46.7%).

Models for the overall Mean-of-Domains (Figure 1) and for the four PCQ-H scales (eFigure 1a–d) were significant with calculated correlations (model-predicted versus actual) response of 0.39 (overall), and ranging from 0.33 to 0.36 for the PCQ-H scales (all *p*'s < 0.0001). Results show that both patient and organizational factors correlated with ratings, summarized as follows:

3.1 | Patient characteristics

First, across all models, respondent's characteristics predicted ratings of primary care for the overall Mean-of-Domains (Figure 1), and for each of the specific PCQ-H scales (eFigure 1a–d).

Typically, patient characteristics associated with better ratings of primary care included stronger **social support, better self-reported health, and (lack of) recent unsheltered homelessness**. Other patient characteristics considered in the CART models typically were not retained or were retained inconsistently across models. On the Cooperation scale, PEH who reported White Race or Multiple Races gave slightly lower ratings of Cooperation among staff compared to PEH who reported Black or Asian-Pacific Island Race, in one node in the model. On the Access/Coordination scale, American Indian/Alaska Native and Multiple Races were associated with a slightly lower rating compared to White, Black and Asian respondents in another node.

3.2 | Organizational characteristics

Second, some organizational measures predicted patient ratings of care, more typically in a lower position in the models; specifically, organizational measures' impact was often found for subgroups already partitioned by patient characteristics. The following summary offers examples of the main findings, in two batches: those aligning with expectations and those departing from our expectations.

*Organizational measures that aligned with **expected** direction of association are described first*:

- For patients' overall PCQ-H (i.e., Mean-of-Domains, Figure 1) rating, stronger *Leadership*, *Teamness*, *and Patient-Centeredness* organizational ratings were associated with better patient ratings.
- For patients' rating of Relationship to their provider (eFigure 1a), the *Coordination* scale and *colocation of mental health and primary care* were associated with better patient ratings.

TABLE 1 Characteristics of surveyed veterans and staff in VA homeless patient-aligned care teams.

Characteristics[a]	*N* (%)
Patients (*N* = 3394)	
Age, mean (SD)	57.9 (9.7)
Gender	
Male	3153 (94.1)
Female	185 (5.5)
Other	14 (0.42)
Race[a]	
American Indian or Alaska Native	60 (1.8)
Asian or Pacific Islander	41 (1.2)
Black or African American	1411 (41.6)
Multiple[b]	312 (9.2)
Not assessable by self-report or VA Data	39 (1.2)
White	1531 (45.1)
Latino/Hispanic[a]	358 (10.8)
Marital status	
Single, never married	972 (29.1)
Married	328 (9.8)
Widowed	215 (6.4)
"In a marriage-like relationship"	160 (4.8)
Divorced	1341 (40.2)
Separated	316 (9.5)
Other	7 (0.21)
Monthly income (self-report)	
<$1000	1522 (46.2)
≥$1000	1775 (53.8)
Current homelessness (self-report)	
Not currently homeless	2877 (84.8)
Currently homeless	517 (15.2)
General self-reported health	
Poor	385 (11.8)
Fair	1123 (34.5)
Good	1169 (35.9)
Very good	453 (13.9)
Excellent	128 (3.9)
Clinics (*N* = 29)[c]	
Staffing	
With MD	17 (58.6)
With PA	2 (6.8)
With NP/DNP	7 (24.1)
With RN	24 (82.8)
With LPN/LVN	2 (6.8)
Panel size	
>250	5 (17.2)
250–400	9 (31.0)
>400	11 (37.9)

[a]Patient characteristics, including race and ethnicity, were self-reported for most participants, with the exception of 462 persons, who either did not respond or offered comments such as "human race," "50-yard dash" and "Heinz 57." Among these 462, race was identified from VA Corporate Data Warehouse records for 423, and left undefined for 39. In analysis, "missing" was allowed as a category for race.
[b]Among persons designated here as "Multiple," 220 Veterans endorsed White, 141 Black, 186 American Indian, 33 Asian and 111 Other with a written text response.
[c]Clinic staff characteristics were assessed from our organizational survey of the clinics, and panel size was obtained from VHA administrative records.

- For patients' rating of Cooperation among team members (eFigure 1b), *Teamness*, *Patient-centeredness*, *Leadership*, and *Greater receipt of patients via self-referral* were associated with better patient ratings.
- For patients' rating of Access/Coordination (eFigure 1c), *Patient-centeredness*, *Teamness*, *Coordination* and *Greater use of secure messaging by the clinic* were associated with better patient ratings.
- For patients' rating of care for Homeless-specific needs (eFigure 1d), *Colocation of a counseling pharmacist with the clinic* and *new patient referrals less dependent on recent medical inpatient stays (at a cutpoint of ≤ 25% of new patients)* were associated with better patient ratings.

Conversely, some organizational scales or inventory items produced **results departing from expectation**. These were more often evident in lower positions in the CART trees and are depicted as yellow ovals in Figure 1 and eFigure 1a–d. For example:

High walk-in availability (with separate items querying whether it was encouraged by staff, and the staff's estimate of a higher percentage of visits by walk-in) was associated with **lower** PCQ-H ratings, both Overall and on ratings for Relationship, Access/Coordination and Homeless-Specific Needs, albeit at lower positions on the regression tree models. This was the most consistent departure from expectation. A few other examples are noted.

The staff's self-rating of higher availability by telephone was associated with a lower Overall Mean-of-Domains from patients (Figure 1).

The organizational Access scale (9 items, including adequacy of space, staff assessments of access to non-primary care services, ability to see a patient right away if they walked in at 3:30 p.m.) was associated with **better** patient ratings of staff cooperation, but **lower** patient ratings on Homeless-specific needs (eFigure 1d).

A higher staff rating on Leadership support was associated with **lower** patient ratings on Homeless-specific needs (eFigure 1d), although this Leadership support scale was associated with better patient ratings overall (Figure 1) and on rating of Cooperation among providers (eFigure 1b).

4 | DISCUSSION

Although evidence supports tailoring primary care services for people with ongoing or recent homelessness,[12,17,18,58,59] empiric research to identify the service arrangements that account for tailoring's impact has been limited. This paper offers the first large, multisite study to open up what has otherwise been a "black box" of homeless-tailored primary care, while also showing considerable variation among 29 VA clinics.

The results identify service features that are likely to matter the most to patients. These include aspects of patient-centeredness at the clinic level, team functioning, strong leadership support, and service features to reach beyond the confines of traditional primary care. The present findings lend support to insights offered by leaders from

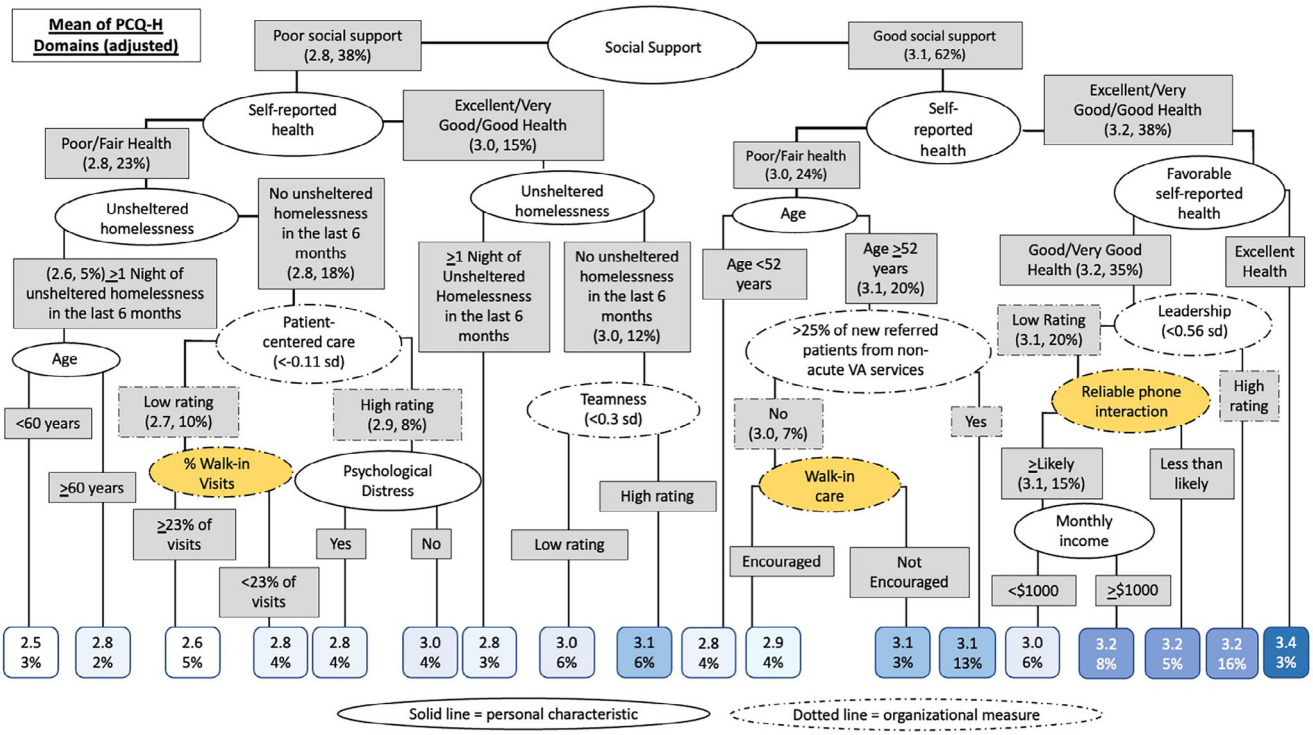

FIGURE 1 Classification and Regression Tree (CART) model, in which the outcome is the mean of the four scales from the patient-reported Primary Care Quality-Homeless (PCQ-H) survey (score range 1–4), termed "Mean-of-Domains" in the manuscript, as reported by 2788 patients with recent or ongoing homelessness who were receiving primary care in one of 29 homeless-specialized primary care teams operated by the United States Veterans Health Administration ("VA Homeless Patient-Aligned Care Teams" or "H-PACTS") in 2018. Inputs to the CART model included patient characteristics collected primarily by survey of the patients, and clinic organizational variables derived from the survey of clinic staff. The organizational variables included five scales (Teamness, Leadership, Coordination, Access and Patient-Centeredness) and 39 additional organizational indicators termed "inventories." These are summarized with examples in Table 2, with all items shown in eTable 4. The patient characteristics included a range of predisposing (e.g., age, race), enabling (e.g., social support), and need characteristics (e.g., self-reported general health). The regression tree modeling process identifies the optimal split for both categorical and continuous variables. For continuous variables, the split-point is identified in relation to the standard deviation of the scale, so "<0.3 SD" indicates the split occurred for ratings that fell less than, versus more than, 0.3 SD. By design, the CART model only retains variables that partition ≥30 respondents. Owing to graphical space constraints, "Asian" stands for "Asian or Pacific Islander," "Black" for "Black or African American," and "American Indian" for "American Indian/Alaska Native." Graphical cues include: ***Shape***: An oval shape denotes a predictor variable. Predictor variables include personal characteristics and organizational variables. A rectangle shape indicates a value (higher, lower, or category indicator) identified in the CART model, either a patient variable or an organizational variable. At bottom, squares with rounded circles show the mean PCQ-H survey scale value (i.e., patient rating) for a person falling into the applicable node. ***Outline***: Oval shapes with a solid border indicate personal characteristics of respondents. Oval shapes with a dashed border indicate organizational variables. ***Color***: Within oval shapes, yellow shading is used to indicate where the direction of association between the organizational departed from the expectations suggested by prior literature or consensus reports. Within squares at the bottom of each graph, color varies to identify nodes with lower patient ratings (white, very light blue) from nodes with higher patient ratings, which are darker shades of blue. Rectangles (values or categories) are shaded light gray solely for convenience, to help the reader easily distinguish them from the ovals (predictor variable).

the National Health Care for the Homeless Council,[52] a nonprofit technical assistance group, and from prior research.[60,61] Below we review key insights concerning (a) the impact of organizational characteristics, (b) trade-offs that arise when tailoring care design and (c) patient characteristics that influence care ratings.

4.1 | Organizational characteristics

First, central to the purpose of this study, three organizational measures were found to be associated with better ratings of care.

Teamness: this includes mutual trust, motivation to serve the population, mutual support among staff, and freedom to share concerns.

Patient-centeredness: including provision of nonmedical assistance and strategies to overcome disruptive behaviors and patients' distrust of the VA itself.

***Support** from local VA **leadership** for the H-PACT*: This includes items asking whether senior medical center leaders prioritize problems that affect H-PACTs.

Teamness, itself a complex construct, may be construed as directly enhancing patient service experiences as people who work well together tend to offer better service. In this study, items for

TABLE 2 Summary of the Homeless-focused primary care OrGanizational Evaluation (HOGE) with Examples of Items for Each Domain.

Domain	Example item	Number of items
Access		
Scale	How satisfactory is your H-PACT in regard to convenience of the location to optimize service access to your patient population?	9
Inventory	Do you believe your H-PACT provides more rapid access to care than the regular primary care clinics associated with your facility?	15
Coordination		
Scale	When clinically indicated, how often can H-PACT patients access Mental Health Services same day?	10
Inventory	Does your H-PACT have a formal system to track whether H-PACT patients attend their referral appointments to specialty services?	6
Accommodation (Patient-Centered Care)		
Scale	How often do you feel your H-PACT team succeeds at overcoming the following challenge: patients missing or arriving late to appointments?	8
Inventory	Does your H-PACT have a policy to transition patients out of H-PACT and into primary care?	8
Staff and Team Dynamics		
Scale	To what extent do you agree with the statement: The H-PACT team members trust each other.	6
Inventory	For any of your staff, are there major problems with having a second commitment to a competing assignment that takes up their time?	1
Leadership		
Scale	To what extent do you agree with the statement: Senior leaders advocate for resources for the H-PACT.	6
Intraorganizational Networks and Communication		
Inventory	Please indicate how much huddles help your team work together.	1
Performance and Quality Improvement		
Inventory	Does your H-PACT have any systematic method to obtain feedback from patients about how the clinic works (such as town hall meetings, suggestion boxes, surveys, etc.)?	3
Outer Setting		
Inventory	How necessary is it that H-PACT clinicians have previous experience working with homeless or other vulnerable populations?	5

Note: The Homeless-focused primary care OrGanizational Evaluation (HOGE) is obtained by interview with clinical staff working in the clinic. The HOGE includes 5 Scales comprised of 39 items and seven Inventories comprised of 39 items, for a total of 78 items. Items in scales are always Likert-type in natue. Items in inventories usually pertain to the presence or absence of a service feature, and include both yes/no and Likert-type responses.
Abbreviation: H-PACT, Homeless Patient-Aligned Care Team.

patient-centeredness map to homeless-specific service adjustments typically highlighted in reports from front-line clinicians and program leaders.[15,32,62]

Support from clinic leadership has not received substantial research attention in primary care. In preliminary site visits, our team heard that organizational leaders can uphold the H-PACT's mission and resolve its problems, or not. In any organization, leaders select staff and navigate trade-offs between service volume and service quality and between patients, payors, and regulators. Our findings align with one review of team science in primary care that touched on "teamlets" (a small team consisting of a clinician, medical assistant, and other staff who work with a defined patient panel),[63] stating:

> Teamlets flourish under favorable conditions (for example, organizational leadership and support for training, time for huddles, and debriefs).

4.2 | Trade-offs

Second, some of this study's findings suggest that tailoring primary care services involves trade-offs between competing priorities. Walk-in visit availability, a long-cherished component of homeless primary care,[15,52] offered a prime example.

Accommodating walk-ins can affect the experience of other patients, at least in VA's H-PACTs (usually a single clinician and an RN and/or clerk).[64] In H-PACTs, walk-in visits may lead to staff stress or patient queuing, a situation evident in experiences of some of this study's authors. For this reason, walk-in appointments may result in long waits for care and inadvertently create the impression of second-class service rather than the special accommodation that was intended. As another example, strategies to limit panel sizes sometimes involve transitioning stable patients off the H-PACT to mainstream primary care, which may disrupt established care relationships. Such trade-offs abound in health care, but they are not always documented.

Other unexpected findings were hard to interpret. With a large number of predictors and comparisons, some findings in eFigure 1a–d invite speculation, as they are not intuitive. For example, staff members' positive assessment of access correlated with less favorable patient ratings on Homeless-Specific Needs; this may reflect limitations in the organization's ability to maximize both access and responsiveness to homelessness, in some instances yet to be sorted out. Thus, at this stage in its development, use of the HOGE survey calls for caution, particularly when comparing organizations. In the long run, the HOGE survey will need additional refinement, as was done for the Modified Patient-Centered Medical Home Assessment.[65,66]

4.3 | Patient characteristics

Third, homeless-experienced patients' characteristics correlate with how they rate their care. Prior patient experience research affirms

some role for patient characteristics,[67–69] including social support.[70–72] For example, in a study of 144 medical groups, Medicare patients' "optimism scores" were key determinants of whether they rated their care to be integrated.[27] To our view, it is likely that patient characteristics operate both as "determinants" of care experiences (i.e., care systems actually perform less effectively for certain patients) and "confounders" (i.e., the patients' characteristics influence how patients rate care, separate from the quality of care delivered).[67] For example, health care providers respond less helpfully to persons with mental health conditions,[73] substance use disorders,[74] homelessness,[28] or infectious disease,[75] all of which tend to correlate with reduced social support. However, patients capable of forming strong supportive relationships in life may also be prove likely to find that support in health care settings as well.[72]

4.4 | Limitations

This study's limitations require review. First, it cannot be assumed that better care experiences assure better disease outcomes, or reduce use of costly acute services. Barbara Starfield, a scholar of primary care, suggested that the "person orientation" of primary care "involves more than disease-focused prevention and management"; she suggested that patient assessments of experience have special utility in assessing primary care.[7]

Second, the HOGE items (eTable 4) were developed as part of this study (even if they derived from prior conceptual work[14,15] and a dissertation[55]). Development of the HOGE entailed trade-offs between statistical performance and the team's intuitions and observations of H-PACTs. Those trade-offs are evident in the nonideal Cronbach's α's and the development of categorical indicators (i.e., "inventories") that did not fall into scales (eTable 4), perhaps in some results that did align with expectation. In the future, the HOGE survey should be refined after application to a different set of homeless-focused clinics, ideally outside the US Veterans Health Administration.[76]

Third, some artifactual variability in scale performance may have resulted from having respondents at each clinic rate their own organization. For example, a respondent from one clinic may designate a "5" when a respondent from another—if invited to examine that same clinic—might have assigned "4." Rating variability could be reduced by funding one team of neutral assessors. However, this requires new research investment.

Fourth, a selection bias could have influenced these findings at two levels. First, the CART models themselves rely on respondents with computable primary care ratings (PCQ-H mean-of-domains, 82%); differences between these 82% and those excluded from analysis were small and nonsignificant (eTable 5). Second, a 40.2% response rate falls well shy 100%. But it is, plausibly, informative, as 40.2% doubles the rate from VA's operational survey for homeless-experienced patients[17] and comes close to the 47% achieved in VA's published evaluations of its easier-to-reach mainstream primary care population.[77] Also, the magnitude of difference between respondents and nonrespondents rarely exceeded 5% in absolute terms (eTable 6). Also, in our prior published comparison of tailored to mainstream care, results did not change after statistical adjustment that included inverse weighting based on propensity to respond.[19]

Research originating within the VA system does not always generalize to non-VA settings. However, the health services question motivating this study is not VA-specific. The VA's efforts to tailor primary care service delivery within H-PACTs were, in the main, borrowed from non-VA programs supported today by DHHS. Also, the PCQ-H survey was developed from interviews and item testing in a mixed population of VA and non-VA clinic patients,[35,78] and embodied priorities articulated by both VA and non-VA clinicians and leaders.[35,37] Similarly, development of the HOGE survey included visits to both VA and non-VA Health Care for the Homeless clinics. In short, even if these data come from VA patients and clinics, this project sought to inform all agencies that deliver primary care to patients with homeless experience.

Finally, aspects of the tailored service model that emerged within CART analyses are likely to be beneficial for other populations in primary care. For example, leadership support and teamness are likely to be relevant across other settings. However, tailoring service is likely to matter most for those who are most vulnerable: prior work comparing the tailored and mainstream primary care services reported that the tailored clinics (H-PACTs) seemed to make the greatest difference for those patients with the greatest number of prespecified vulnerabilities.[19]

One strength to this study is its size. Surveying over 3000 currently and recently homeless Veterans across 29 clinics was a major undertaking,[36] as was completion of 52 interviews with VA clinic staff prohibited from receiving survey incentives under VA rules. There is a need for more research of this size to show how best to deliver high-quality care to populations with extreme medical and social vulnerabilities, particularly in light of public commitments to addressing social determinants of health,[79] the overdose crisis,[80] and homelessness itself.[81] Finally, this study shows how CART analyses can enhance health care organizational research.[82]

The implications of this study are notable. Practitioners have long declared that health care for people who are homeless calls for a different organizational response, one that goes beyond merely assuring that care is free.[52,83]

Organizations and funders can choose whether to promote care tailored for persons experiencing homelessness.[84] They choose based on who they hire, how they foster teams, whether those teams can stretch the bounds of "traditional primary care," and how leaders support them. Payers, private and public, could incentivize such choices with program requirements, funding supplements, or even penalties. Although our findings come from the VA, they should inform the non-VA Health Care for the Homeless program, which is funded by the United States DHHS, through its Bureau of Primary Health Care. By law and tradition, the Bureau requires Health Care for Homeless grantees to meet requirements mostly identical to those applied to all community health centers, with no tailoring, save for access to addiction care.[85] This study, and its predecessors,[12,17,19,25] suggest that a

homeless-tailored service model, rather than a generic one, could better advance primary care for a uniquely vulnerable population.

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CONFLICT OF INTEREST STATEMENT

Dr. Stefan G. Kertesz reports ownership of health-related stocks: DexCom, Thermo Fisher, and past ownership in Zimmer Biomet. He receives royalties from Wolters-Kluwer, Inc, publisher of UpToDate. Dr Allyson L. Varley reports unvested stock options with Heart Rhythm Clinical and Research Solutions. None have any known interest in this work.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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