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Journal

Medical Care, 59(6)

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Publication Date

2021-06-01

DOI

10.1097/MLR.0000000000001548

Peer reviewed

Comparison of Patient Experience Between Primary Care Settings Tailored for Homeless Clientele and Mainstream Care Settings

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Abstract

Background—More than one million Americans receive primary care from federal homeless health care programs yearly. Vulnerabilities that can make care challenging include pain,

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addiction, psychological distress, and a lack of shelter. Research on the effectiveness of tailoring services for this population is limited.

Objective—To examine whether homeless-tailored primary care programs offer a superior patient experience compared to non-tailored ("mainstream") programs overall, and for highly vulnerable patients.

Research Design—National patient survey comparing 26 US Department of Veterans Affairs (VA) Medical Centers' homeless-tailored primary care ("H-PACT"s) to mainstream primary care ("mainstream PACT"s) at the same locations.

Participants—5766 homeless-experienced veterans (HEVs).

Measures—Primary care experience on 4 scales: Patient-Clinician Relationship, Cooperation, Accessibility/Coordination, and Homeless-Specific Needs. Mean scores (range 1–4) were calculated and dichotomized as unfavorable versus not. We counted key vulnerabilities (chronic pain, unsheltered homelessness, severe psychological distress, and history of overdose, 0–4), and categorized HEVs as having fewer (1) and more (2) vulnerabilities.

Results—H-PACTs outscored mainstream PACTs on all scales (all p<0.001). Unfavorable care experiences were more common in mainstream PACTs compared to H-PACTs, with adjusted risk differences of 11.9% (95% CI=6.3–17.4), 12.6% (6.2–19.1), 11.7% (6.0–17.3), and 12.6% (6.2–19.1) for Relationship, Cooperation, Access/Coordination, and Homeless-Specific Needs, respectively. For the Relationship and Cooperation scales, H-PACTs were associated with a greater reduction in unfavorable experience for patients with 2 vulnerabilities versus 1 (interaction p<0.0001).

Conclusions—Organizations that offer primary care for persons experiencing homelessness can improve the primary care experience by tailoring the design and delivery of services.

Introduction

More than 560,000 persons in the US are homeless each night.[1] Compared to other adults, persons who are homeless or recently homeless have greater psychological distress,[2] medical morbidity,[3] chronic pain,[4] and risk of overdose.[5,6] Primary care could assist this population, but homeless individuals experience difficulties not just in accessing care,[7] but also in the quality of their interactions when they obtain care. Care experiences include stigma, feeling unwelcome, and negative encounters with staff.[8] Such experiences may impede therapeutic relationships and reduce treatment engagement.[9]

Recent years have seen efforts to tailor primary care for homeless persons with the goal of improving care engagement.[10] Here, "tailoring" refers to design of services, as decided by organizational leadership, to serve a population.[10,11] Tailoring may include deploying clinicians to shelters or streets, longer visit times, specialized staff training, integrated addiction services, tangible assistance (e.g., clothing, food, lodging), or co-location of social

and mental health care.[12] Tailoring is undertaken by only some of the 300 agencies receiving federal Health Care for the Homeless (HCH) funds, which served more than 1 million persons in 2017.[13] However, the law establishing HCH programs does not require service tailoring.[14]

The US Department of Veterans Affairs (VA) reorganized primary care providers and staff into Patient Aligned Care Teams (PACTs) in 2010, some of which tailor services for Veterans who have experienced homelessness. A PACT is an interdisciplinary team, typically including a prescribing provider, nurse case manager, a clerk, and others, who share responsibility for primary care.[15] Beginning in 2012, select VA facilities tailored the PACT model to address the needs of homeless-experienced Veterans (HEVs).[10] Homeless-Patient Aligned Care Teams (H-PACTs) work alongside mainstream PACTs (i.e., those not specifically tailored for persons who are homeless) in the same facilities. H-PACTs enroll medically and socially vulnerable HEVs, and adapt their services design to mitigate access barriers, address the social determinants of health, and facilitate housing placement.[10]

Policy decisions regarding whether to promote primary care tailoring for homeless populations depend on limited evidence. One review of the literature focused on 17 published studies but assessed that only 3 had strong internal validity.[11] The evidence often comes from localized samples,[16] or small-to-medium national surveys.[17] One study found that patients (n=601) rated care better at a highly-tailored non-VA HCH program, compared to 4 less-tailored VA programs.[18] Such results, however, could reflect differences in populations served across the 5 settings.

Another study found HEVs in H-PACTs rated their experience with access, communication, office staff, providers, and comprehensiveness better than did HEVs in mainstream PACTs at the same VA sites.[17] However, that study had a small number of H-PACT users (n=251) and a low response rate (21%). Additionally, it used a general primary care experience questionnaire, based on the Consumer Assessment of Health Plans (CAHPS).[19] General questionnaires may not capture aspects of primary care experience important for patients whose vulnerabilities can make establishing effective primary care more challenging: chronic pain,[20] addiction,[21] mental health issues[22] and unsheltered status.[23]

To answer the question, does tailoring make a difference, this study sought to determine whether HEVs obtain a superior primary care experience in H-PACTs compared to mainstream PACTs.[15] We considered this question for HEVs overall, and for HEVs with greater social and medical vulnerabilities. We hypothesized that HEVs receiving primary care in H-PACTs would rate care more favorably and be less likely to report unfavorable experiences, compared to HEVs in mainstream PACTs. We then explored whether H-PACTs were associated with fewer unfavorable experiences for patients with vulnerabilities that are sometimes difficult to manage in mainstream settings: chronic pain, addiction, severe psychological distress, and/or unsheltered homelessness.

Methods

We surveyed a large sample of HEVs from 26 VA Medical Centers (VAMCs) across 20 US states, reflecting the largest H-PACTs in operation. We compared primary care experience among HEVs in H-PACTs to those in mainstream PACTs at the same 26 VAMCs to reduce confounding due to site variations in geography, organizational characteristics, or provider supply. The intent was to obtain a sample in which roughly one-third of participants were from mainstream PACTs and two-thirds utilized H-PACTs. Mainstream PACT patients were selected randomly in 1:2 ratio, for each site, reflecting sample sizes required to adequately power future, subsidiary analyses among H-PACTs alone. This report's alignment with Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) is shown in eTable 1. The funder had no role in study design or analysis.

Sample

In November 2017, we used VA records to identify HEVs receiving primary care services in mainstream PACTs or H-PACTs at 26 VAMCs that operated the largest H-PACTs at the time (Flow Diagram, Figure 1). Veterans were eligible for survey if they had evidence of homelessness[24] in VHA administrative records from May 2015-November 2017 (eTable 2), attended 2 or more primary care visits in 24 months (November 2015–2017) at the same study site, and were coded administratively as assigned to a single mainstream PACT or H-PACT (n=85,719). We excluded HEVs from sampling if their mainstream PACT care was located at an outlying clinic, remote from the VAMC that housed the H-PACT (n=28,499 excluded).

From the eligible sampling pool of VEHs, we chose *all* H-PACT patients from 25 VAMCs for potential participation; in one large H-PACT, we randomly selected 1000. We then randomly selected HEVs from the mainstream PACTs in a 1:2 mainstream to H-PACT ratio by site. Of the 14,656 chosen for potential participation, 294 HEVs died prior to recruitment, and 22 had no mailing address or telephone number. The final sample for recruitment included 14,340 HEVs.

Recruitment

We contracted a professional survey organization, Strategic Research Group (SRG), for recruitment and data collection. SRG verified and standardized HEVs' mailing addresses from VA records and commercial sources. SRG mailed potential participants an introductory letter, followed by the questionnaire packet with $1 pre-incentive 2 weeks later, and a postcard reminder in the third week. One week after the postcard reminder, SRG mailed the questionnaire packet again and called non-respondents (up to 5 calls and 2 voicemails) with an option to complete the questionnaire by telephone. Veterans completing the questionnaire received a thank-you letter and a $10 prepaid debit card.

Measures

Outcome: Patient experiences were assessed on 4 scales from a 33-item primary care questionnaire developed and validated for homeless-experienced populations, the Primary Care Quality-Homeless (PCQ-H) survey.[25] The PCQ-H requires Likert-type responses

ranging from strongly disagree to strongly agree (1-4). Negative valence items are reverse-scored so that higher scores reflect more favorable care experiences. The 4 PCQ-H scales are:

1. patient–clinician relationship ("Relationship," 15 items). Example: "If my primary care provider and I were to disagree about something related to my care, we could work it out."

2. cooperation among clinicians ("Cooperation," 3 items). Example: "I have been frustrated by lack of communication among my primary care and other health care providers."

3. accessibility and coordination ("Access/Coordination," 11 items). Example: "My primary care provider helps to reduce the hassles when I am referred to other services"

4. homeless-specific needs (4 items).[25] Example: "This place tries to help me with things I might need right away like food, shelter or clothing."

All items are shown on eTable 3.

The PCQ-H achieves internal consistency scores similar to the CAHPS.[19] It is shorter (694 words), easier to read (7th grade reading level), and focuses on priorities articulated by this population, including stigma, trust, mental health, and tangible needs. PCQ-H scores are based on the average responses for each scale (range: 1–4). The PCQ-H permits empiric calculation of an unfavorable care experience indicator by scale. Item responses are coded unfavorable or not, where disagreement (i.e., Strongly/somewhat disagree) to positive valence items and agreement (i.e., Strongly/somewhat agree) to negative valence items are coded as unfavorable. We counted the number of unfavorable responses for each scale, and categorized patients with the highest tertile of unfavorable responses as having unfavorable experiences for that scale. The unfavorable experience cutoffs were 3 or more unfavorable responses for the Relationship and Access/Coordination scales, 2 or more for Cooperation and 1 or more for Homeless-Specific Needs. This method is analogous to "problem-oriented reporting" for the CAHPS.[26]

Covariates: To control for differences in case-mix between care settings, our questionnaire also assessed a set of variables derived from the Behavioral Model for Vulnerable Populations,[27] categorized as *predisposing*, *enabling/impeding*, and *need*. *Predisposing* characteristics included age, gender, race, and Hispanic/Latinx ethnicity. *Enabling/impeding* characteristics included unsheltered homelessness (1 or more nights in the last 6 months spent outside or in a place not meant for sleeping), chronic homelessness (based on affirming 4 or more episodes in 3 years, or >1 year for the longest duration homeless), and low income (<$1000 monthly). We crafted a 6-item social support scale combining 4 "Emotional Support" items from the National Institutes of Health Patient-Reported Outcomes Measurement Information System (PROMIS), 1 item from its Social Isolation scale,[28] and 1 referencing capacity to borrow $20 (Cronbach α=0.84). *Need* characteristics included a count of 8 self-reported medical conditions used in satisfaction studies in the Medical Expenditure Panel Survey[29] and psychological distress based on summing

a combination of 4 depression/anxiety items from the PHQ-4[30] and 2 items assessing psychotic symptoms from the Colorado Mental Health Symptom Index (range 0–24, Cronbach α=0.84) (eTable 4).[31,32] To assist clinical interpretability, psychological distress was dichotomized at 10 to indicate "severe": a score of 10 would be attained if a person reported 5 of 6 symptoms "several days" a week, or if they reported 3 of 6 symptoms "more than half the days" a week and 1 symptom "1 or 2 days." The questionnaire also assessed current alcohol or drug problems using the Two-Item Conjoint Screening test,[33] receipt of psychiatric medication,[34] and chronic pain of a severe nature. Severe chronic pain was assessed with 1 item from the Brief Chronic Pain Questionnaire focused on pain lasting at least 3 months[35,36] coupled with rating of average past-week pain severity at 7 or higher on a 10-point pain scale.

Number of vulnerabilities: We explored whether differences in experience might vary for patients with a greater number of medical and social vulnerabilities shown to impact primary care delivery: severe chronic pain,[37,38] severe psychological distress,[39] unsheltered homelessness during the past 6 months,[40] and self-report of overdose on alcohol or drugs requiring medical care in the last 3 years. The selection of these 4 vulnerabilities was based on the literature and reflections of 3 authors (SK, LG, AG) who have offered primary care for homeless patients. We counted the number of these vulnerabilities (0–4), and classified respondents as low (1) or high (2) vulnerability.

Analysis Approach

We addressed potential bias due to nonresponse. First, we compared sociodemographic and clinical characteristics of respondents and non-respondents based on 24 months of VA records, count of major medical diagnoses,[41–43] presence or absence of specific mental conditions, number of contacts with VA homeless services, and inpatient medical and emergency services (eTable 5). From this we estimated the propensity (p) for survey response, using logistic regression.

Separately, we assessed patterns of missingness on PCQ-H scales. For persons responding to 40% or more of the items on a scale, a score was calculated as the mean of non-missing items.[44] Persons answering fewer than 40% of items on a scale were dropped from analyses for that scale.

We compared the characteristics of HEVs from H-PACTs and mainstream PACTs on predisposing, enabling, and need variables, using Chi-square and t-test statistics.

We compared PCQ-H scores and unfavorable experience prevalence using multiple linear regression and multivariable logistic regression, respectively, controlling for aforementioned covariates. We devised a count of the aforementioned proposed vulnerabilities of severe chronic pain,[37,38] psychological distress,[39] unsheltered homelessness,[40] and overdose (0–4). We checked for a linear trend between the vulnerability count and unfavorable experience likelihood using the Mantel-Haenszel Chi-Square test. In the multivariable models, we classified respondents as low (1) or high (2) vulnerability and tested for an interaction between clinic type (H-PACT versus mainstream PACT) and vulnerability (low versus high) for each PCQ-H scale. These were the only interactions tested. To better illustrate

these interactions, where they emerged, we reran the models after classifying patients into the following 4 groups: (a) H-PACT with 2 vulnerabilities, (b) H-PACT with 1 vulnerability, (c) mainstream PACT with 2 vulnerabilities, and (d) mainstream PACT with 1 vulnerability.

All multivariable analyses were weighted for non-response (1/probability of response), included a random effect for site (n=26), and allowed for random slopes and intercepts by site. Analyses were conducted in SAS 9.0, and p-values <0.05 were considered significant.

Ethics

The study was approved by the VA Central Institutional Review Board (IRB). The funder, Veterans Health Services Research and Development, had no role in study conduct or publication.

Results

Respondents versus non-respondents

Of the 14,340 HEVs chosen for potential participation, 5,766 (40.2%) responded to the questionnaire. Respondents differed from non-respondents on sociodemographic characteristics obtainable from VA records, but the magnitude rarely exceeded 5% in absolute terms (eTable 5). Of note, non-respondents were younger than respondents (mean age 54.0 vs 58.3, p<0.001). Non-respondents were more likely than respondents to be enrolled in H-PACTs (66.5% vs 58.9%), less likely to be frequent primary care users (>10 visits in the prior 24 months: 33.8% vs 42.5%), and more likely to qualify as having a psychotic disorder (15.5% vs 10.8%) (all p<0.001).

Characteristics of persons enrolled in H-PACTs versus mainstream PACTs

HEVs in H-PACTs differed from HEVs in mainstream PACTs (Table 1). HEVs in H-PACTs were less likely to be in the oldest age group (16.9% older than 65 vs 30.9% for mainstream, p<0.001). They were also more likely to be male (94.1% vs 85.8%, p<0.001), to have monthly income of less than $1000 (46.2% vs 31.3%, p<.001), and to self-report an alcohol (30.6% vs 26.0%, p<0.001) or drug problem (15.3% vs 11.7%, p<0.001). A minority affirmed being unsheltered for at least 1 night in the 6 months prior to completing the questionnaire (16.3% for H-PACT vs 12.1% for mainstream, p<0.001). There were no differences regarding race, ethnicity, or psychological distress.

Mean differences in Primary Care Quality-Homeless scores

Mean patient primary care ratings were favorable, hovering around 3 on a 1–4 scale (Table 2). However, mean scores were higher (all p<0.001) for HEVs in H-PACTs, compared to HEVs in mainstream PACTs on all 4 scales. The differences remained statistically significant and of a similar magnitude after adjusting for patient characteristics. The mean difference in adjusted score ranged from 0.15 on the Access/Coordination scale to 0.21 on the Homeless-Specific Needs scale, with effect sizes ranging from 0.18 (for Cooperation) to 0.31 (for Homeless-Specific Needs), based on standard deviations of 0.4–0.7 (Table 2). All differences favored H-PACT over mainstream PACTs.

Unfavorable primary care experiences

The pattern of differences between H-PACT and mainstream PACTs was similar when we examined unfavorable experiences (Table 2, Figure 3). HEVs in H-PACTs were less likely than HEVs in mainstream PACTs to report unfavorable experiences on all scales, with a multivariable-adjusted difference of 11.9% (95% CI 6.3%-17.4%), 12.6% (6.2%-19.1%), 11.7% (6.0%-17.3%), and 12.6% (6.2%-19.1%) for Relationship, Cooperation, Access/Coordination, and Homeless-Specific Needs, respectively (all p<.001). Said another way, patients in PACTs were 26% to 47% more likely than those in PACTs to have unfavorable care experiences.

Association of number of key vulnerabilities with unfavorable experiences

Unfavorable care experiences were common for patients with the 4 key vulnerabilities (Figure 2). Among those with no vulnerabilities, the percentage with unfavorable experiences ranged from 17.3% to 32.0%. With 3 or more vulnerabilities, it ranged from 43.6% to 65.6% (Figure 2, Mantel-Haenszel Chi-Square test of trend for each scale, p<0.0001).

Interaction of H-PACT setting with number of illustrative patient vulnerabilities in relation to unfavorable experiences

For 2 scales (Relationship and Cooperation), the difference in unfavorable experiences between patients in H-PACTs and mainstream PACTs was greater for high vulnerability patients, compared to low vulnerability patients (test of interaction of H-PACT by vulnerability, p<0.001). To illustrate, among HEVs with 2 vulnerabilities, H-PACT patients were 18–19% less likely (absolute) than HEVs in mainstream PACTs to have unfavorable experiences on these 2 scales (Figure 3). Among HEVs with 1 vulnerability, H-PACT patients were only 8% less likely than HEVs in mainstream PACTs to have unfavorable experiences. The same test of interaction was not significant for the Access/Coordination (p=0.41) or Homeless-Specific Needs (p=0.06) scales.

Discussion

In this study, HEVs who received primary care tailored for persons who have been homeless (VA's H-PACTs) rated their primary care more favorably than HEVs who received care in mainstream PACTs. The finding that H-PACTs offer a superior patient experience is important given that care ratings are associated with use of recommended services[45,46] and more favorable health status.[47] Care ratings also predict continuity of care relationships.[48,49]

The difference in care experience between patients in H-PACTs and those in mainstream PACTs represented a small to medium effect size, based on comparison of mean adjusted scores. That difference was more pronounced when considering the probability of a categorical unfavorable experience. In addition, our analyses show a correlation between key patient vulnerabilities and the likelihood of an unfavorable experience. The vulnerabilities we chose were ones that clinicians often find challenging to address: severe chronic pain, addiction, psychological distress, and unsheltered homelessness. At a time when the US

faces a crisis of addiction involving opioids and pain, there is urgency to engaging patients with these vulnerabilities in primary care, even when they are not homeless.

Some insight may be gained from our finding that the contrast between H-PACTs and mainstream PACTs was greater for high-vulnerability than for low-vulnerability patients on 2 particular scales: the clinician-patient Relationship and the patient's perception of Cooperation among clinicians. These scales focus on human relationships. Our interpretation is that these relationships are stressed when patients present with a heavier load of vulnerabilities like unsheltered homelessness, chronic pain, past overdose, and severe psychological distress. As a result, conflict can emerge between clinicians and in relationships with patients. Plausibly, H-PACTs—which offer additional tools, resources, training, and time with patients—can play a mitigating role in protecting patient-clinician relationships and in helping members of the clinical team find common ground in ways that patients can see.

Our finding of a better care experience in H-PACTs does align with a prior, smaller study that focused on an early period of VA's H-PACT program (2013–2014).[17] That study used a standard VA questionnaire that did not query concerns such as stigma, ease of walk-in care, or staff cooperation. Our results, based on data collected 5 years after H-PACTs began, hint at a benefit from sustained investments in tailoring primary care for homeless populations.

Limitations apply. First, HEVs utilizing H-PACTs differ to some degree from those using mainstream PACTs. This study did adjust for a large number of characteristics that may be associated with patient ratings of care, as well as mental health and social variables not typically assessed or controlled for, such as psychological distress at the time of survey completion. However, such adjustment cannot eliminate the possibility of unmeasured confounders. Second, a 40% response rate necessitates caution. However, 40% is roughly double the rate for HEVs (21%) in prior VA surveys[17] and only somewhat lower than the 47% achieved with mostly non-homeless patients in VA's national evaluation of PACTs.[15] Further, our analyses were weighted for the likelihood of survey nonresponse using clinical data available for both respondents and non-respondents. Third, a survey study dependent on voluntary participants with some form of contact information may not generalize to the most vulnerable veterans who are currently homeless, who may lack any method of contact, and who may decline to participate. However, recruiting a large random sample of respondents who are currently homeless, lacking both addresses and phones, would have been logistically prohibitive. Fourth, we caution that designation of "unfavorable" experience reflects a bottom tertile of responses but should not be construed to imply mistreatment or abuse.

This study's strengths include a sample size larger than most homeless surveys to date, detailed covariate measures, and a patient questionnaire intentionally designed for homeless populations. Additionally, we assessed characteristics such as pain and housing status that are not collected in standard health questionnaires. Sampling from 26 VAMCs that served 85% of HEVs strengthens the case for generalizability.

These findings could be relevant to over 300 HCH programs operating today, which serve over 1 million homeless and low-income persons yearly.[13] While some HCH programs tailor services in ways similar to the VA H-PACTs, such tailoring is not required, and many do not. Our study does not pinpoint the service features which made the difference for patients served by H-PACTs. However, relevant characteristics are likely to include those emphasized in H-PACT program design,[12] including staff recruitment and training, co-location of services, outreach, walk-in availability, smaller panel sizes, and tangible resources like clothing. Future research should assess whether tailored service design is associated with better health or social outcomes. Nonetheless, success in engaging patients in primary care by offering a favorable experience is likely to be the prerequisite to advancing the health and well-being of this vulnerable population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Funding

References

1. Office of Community Planning and Development. The 2018 Annual Homeless Assessment Report (AHAR) to Congress (Part 1). 2019; Available at: https://files.hudexchange.info/resources/documents/2018-AHAR-Part-1.pdf. Accessed May 15, 2020.

2. Gelberg L, Linn LS. Psychological distress among homeless adults. J Nerv Ment Dis. 1989;177(5):291–295. [PubMed: 2785158]

3. Patanwala M, Tieu L, Ponath C, Guzman D, Ritchie CS, Kushel M. Physical, Psychological, Social, and Existential Symptoms in Older Homeless-Experienced Adults: An Observational Study of the HOPE HOME Cohort. J Gen Intern Med. 2018.

4. Landefeld JC, Miaskowski C, Tieu L, et al. Characteristics and Factors Associated With Pain in Older Homeless Individuals: Results From the Health Outcomes in People Experiencing Homelessness in Older Middle Age (HOPE HOME) Study. J Pain. 2017;18(9):1036–1045. [PubMed: 28412229]

5. Midboe AM, Byrne T, Smelson D, Jasuja G, McInnes K, Troszak LK. The Opioid Epidemic In Veterans Who Were Homeless Or Unstably Housed. Health Aff (Millwood). 2019;38(8):1289–1297. [PubMed: 31381401]

6. Bauer LK, Brody JK, Leon C, Baggett TP. Characteristics of Homeless Adults Who Died of Drug Overdose: A Retrospective Record Review. J Health Care Poor Underserved. 2016;27(2):846–859. [PubMed: 27180712]

7. Kushel MB, Vittingoff E, Haas JS. Factors associated with the health care utilization of homeless persons. JAMA. 2001;285(2):200–206. [PubMed: 11176814]

8. Ramsay N, Hossain R, Moore M, Milo M, Brown A. Health Care While Homeless: Barriers, Facilitators, and the Lived Experiences of Homeless Individuals Accessing Health Care in a Canadian Regional Municipality. Qual Health Res. 2019:1049732319829434.

9. Campbell DG, Bonner LM, Bolkan CR, et al. Stigma Predicts Treatment Preferences and Care Engagement Among Veterans Affairs Primary Care Patients with Depression. Ann Behav Med. 2016;50(4):533–544. [PubMed: 26935310]

10. O'Toole TP, Buckel L, Bourgault C, et al. Applying the chronic care model to homeless veterans: can a population approach to primary care impact utilization and clinical outcomes? Am J Pub Health. 2010;100:2493–2499. [PubMed: 20966377]

11. Jego M, Abcaya J,   tefan D-E, Calvet-Montredon C, Gentile S. Improving Health Care Management in Primary Care for Homeless People: A Literature Review. Int J Environ Res Public Health. 2018;15(2):309.

12. O'Toole TP, Johnson EE, Aiello R, Kane V, Pape L. Tailoring Care to Vulnerable Populations by Incorporating Social Determinants of Health: the Veterans Health Administration's "Homeless Patient Aligned Care Team" Program. Prev Chronic Dis. 2016;13:E44. [PubMed: 27032987]

13. Health Resources and Services Administration. National Health Care for the Homeless Program Grantee Data. 2019; Available at: https://bphc.hrsa.gov/uds/datacenter.aspx?q=tall&year=2018&state=&fd=ho. Accessed July 31, 2020.

14. 104th Congress of the United States. Health Centers Consolidation Act, Title III, Section 330(h). 1996; Available at: https://www.congress.gov/104/plaws/publ299/PLAW-104publ299.pdf. Accessed July 31, 2020.

15. Nelson KM, Helfrich C, Sun H, et al. Implementation of the patient-centered medical home in the Veterans Health Administration: associations with patient satisfaction, quality of care, staff burnout, and hospital and emergency department use. JAMA Intern Med. 2014;174(8):1350–1358. [PubMed: 25055197]

16. O'Toole TP, Johnson EE, Borgia M, et al. Population-Tailored Care for Homeless Veterans and Acute Care Use, Cost, and Satisfaction: A Prospective Quasi-Experimental Trial. Prev Chronic Dis. 2018;15:E23. [PubMed: 29451116]

17. Jones AL, Hausmann LRM, Kertesz SG, et al. Providing Positive Primary Care Experiences for Homeless Veterans Through Tailored Medical Homes: The Veterans Health Administration's Homeless Patient Aligned Care Teams. Med Care. 2019;57(4):270–278. [PubMed: 30789541]

18. Kertesz SG, Holt CL, Steward JL, et al. Comparing homeless persons' care experiences in tailored versus nontailored primary care programs. Am J Pub Health. 2013;103 Suppl 2:S331–339. [PubMed: 24148052]

19. Scholle SH, Vuong O, Ding L, et al. Development of and field test results for the CAHPS PCMH Survey. Med Care. 2012;50 Suppl:S2–10. [PubMed: 23064272]

20. Bergman AA, Matthias MS, Coffing JM, Krebs EE. Contrasting Tensions Between Patients and PCPs in Chronic Pain Management: A Qualitative Study. Pain Med. 2013;14(11):1689–1697. [PubMed: 23870100]

21. Merrill JO, Rhodes LA, Deyo RA, Marlatt GA, Bradley KA. Mutual mistrust in the medical care of drug users: the keys to the "narc" cabinet. J Gen Intern Med. 2002;17(5):327–333. [PubMed: 12047728]

22. Corrigan PW, Mittal D, Reaves CM, et al. Mental health stigma and primary health care decisions. Psychiatry Res. 2014;218(1):35–38. [PubMed: 24774076]

23. Skosireva A, O'Campo P, Zerger S, Chambers C, Gapka S, Stergiopoulos V. Different faces of discrimination: perceived discrimination among homeless adults with mental illness in healthcare settings. BMC Health Serv Res. 2014;14(1):376. [PubMed: 25196184]

24. Peterson R, Gundlapalli AV, Metraux S, et al. Identifying Homelessness among Veterans Using VA Administrative Data: Opportunities to Expand Detection Criteria. PLoS One. 2015;10(7):e0132664. [PubMed: 26172386]

25. Kertesz SG, Pollio DE, Jones RN, et al. Development of the Primary Care Quality-Homeless (PCQ-H) instrument: a practical survey of homeless patients' experiences in primary care. Med Care. 2014;52(8):734–742. [PubMed: 25023918]

26. Elliott MN, Beckett MK, Kanouse DE, Hambarsoomians K, Bernard S. Problem-oriented reporting of CAHPS consumer evaluations of health care. Med Care Res Rev. 2007;64(5):600–614. [PubMed: 17717379]

27. Gelberg L, Andersen RM, Leake BD. The Behavioral Model for Vulnerable Populations: application to medical care use and outcomes for homeless people. Health Serv Res. 2000;34(6):1273–1302. [PubMed: 10654830]

28. Hahn EA, DeWalt DA, Bode RK, et al. New English and Spanish social health measures will facilitate evaluating health determinants. Health Psychol. 2014;33(5):490–499. [PubMed: 24447188]

29. Fenton JJ, Jerant AF, Bertakis KD, Franks P. The cost of satisfaction: a national study of patient satisfaction, health care utilization, expenditures, and mortality. Arch Intern Med. 2012;172(5):405–411. [PubMed: 22331982]

30. Kroenke K, Spitzer RL, Williams JB, Lowe B. An ultra-brief screening scale for anxiety and depression: the PHQ-4. Psychosomatics. 2009;50(6):613–621. [PubMed: 19996233]

31. Boothroyd RA, Chen HJ. The psychometric properties of the Colorado Symptom Index. Adm Policy Ment Health. 2008;35(5):370–378. [PubMed: 18561020]

32. Conrad KJ, Yagelka JR, Matters MD, Rich AR, Williams V, Buchanan M. Reliability and validity of a modified Colorado Symptom Index in a national homeless sample. Adm Policy Ment Health. 2001;3(3):141–153.

33. Brown RL, Leonard T, Saunders LA, Papasouliotis O. A two-item screening test for alcohol and other drug problems. J Fam Pract. 1997;44(2):151–160. [PubMed: 9040518]

34. McLellan AT, Kushner H, Metzger D, et al. The Fifth Edition of the Addiction Severity Index. J Subst Abuse Treat. 1992;9(3):199–213. [PubMed: 1334156]

35. Merlin JS, Westfall AO, Chamot E, et al. Quantitative Evaluation of an Instrument to Identify Chronic Pain in HIV-Infected Individuals. AIDS Res Hum Retroviruses. 2015;31(6):623–627. [PubMed: 25693683]

36. Merlin JS, Walcott MM, Herbey I, et al. Qualitative investigation of a Brief Chronic Pain Screening tool in HIV-infected patients. AIDS Patient Care STDS. 2014;28(4):176–182. [PubMed: 24621145]

37. Chang JS, Kushel M, Miaskowski C, et al. Provider Experiences With the Identification, Management, and Treatment of Co-occurring Chronic Noncancer Pain and Substance Use in the Safety Net. Subst Use Misuse. 2017;52(2):251–255. [PubMed: 27754719]

38. Vijayaraghavan M, Penko J, Guzman D, Miaskowski C, Kushel MB. Primary Care Providers' Views on Chronic Pain Management Among High-Risk Patients in Safety Net Settings. Pain Med. 2012;13(9):1141–1148. [PubMed: 22846057]

39. McCabe MP, Leas L. A qualitative study of primary health care access, barriers and satisfaction among people with mental illness. Psychol Health Med. 2008;13(3):303–312. [PubMed: 18569898]

40. Kertesz SG, Larson MJ, Horton NJ, Winter M, Saitz R, Samet JH. Homeless chronicity and health-related quality of life trajectories among adults with addictions. Med Care. 2005;43(6):574–585. [PubMed: 15908852]

41. Quan H, Sundararajan V, Halfon P, et al. Coding algorithms for defining comorbidities in ICD-9-CM and ICD-10 administrative data. Med Care. 2005;43(11):1130–1139. [PubMed: 16224307]

42. Elixhauser A, Steiner C, Harris DR, Coffey RM. Comorbidity measures for use with administrative data. Med Care. 1998;36(1):8–27. [PubMed: 9431328]

43. Quan H, Parsons GA, Ghali WA. Validity of information on comorbidity derived rom ICD-9-CCM administrative data. Med Care. 2002;40(8):675–685. [PubMed: 12187181]

44. Safran DG, Karp M, Coltin K, et al. Measuring Patients' Experiences with Individual Primary Care Physicians. Results of a Statewide Demonstration Project. J Gen Intern Med. 2006;21(1):13–21. [PubMed: 16423118]

45. Villani J, Mortensen K. Patient-provider communication and timely receipt of preventive services. Prev Med. 2013;57(5):658–663. [PubMed: 24021993]

46. Stevens GD, Shi L, Vane C, Peters AL. Do experiences consistent with a medical-home model improve diabetes care measures reported by adult Medicaid patients? Diabetes Care. 2014;37(9):2565–2571. [PubMed: 24947789]

47. Stevens GD, Shi L, Vane C, Nie X, Peters AL. Primary care medical home experience and health-related quality of life among adult medicaid patients with type 2 diabetes. J Gen Intern Med. 2015;30(2):161–168. [PubMed: 25316585]

48. Safran DG, Montgomery JE, Chang H, Murphy J, Rogers WH. Switching doctors: predictors of voluntary disenrollment from a primary physician's practice. J Fam Pract. 2001;50(2):130–136. [PubMed: 11219560]

49. Safran DG. Defining the future of primary care: what can we learn from patients? Ann Intern Med. 2003;138(3):248–255. [PubMed: 12558375]
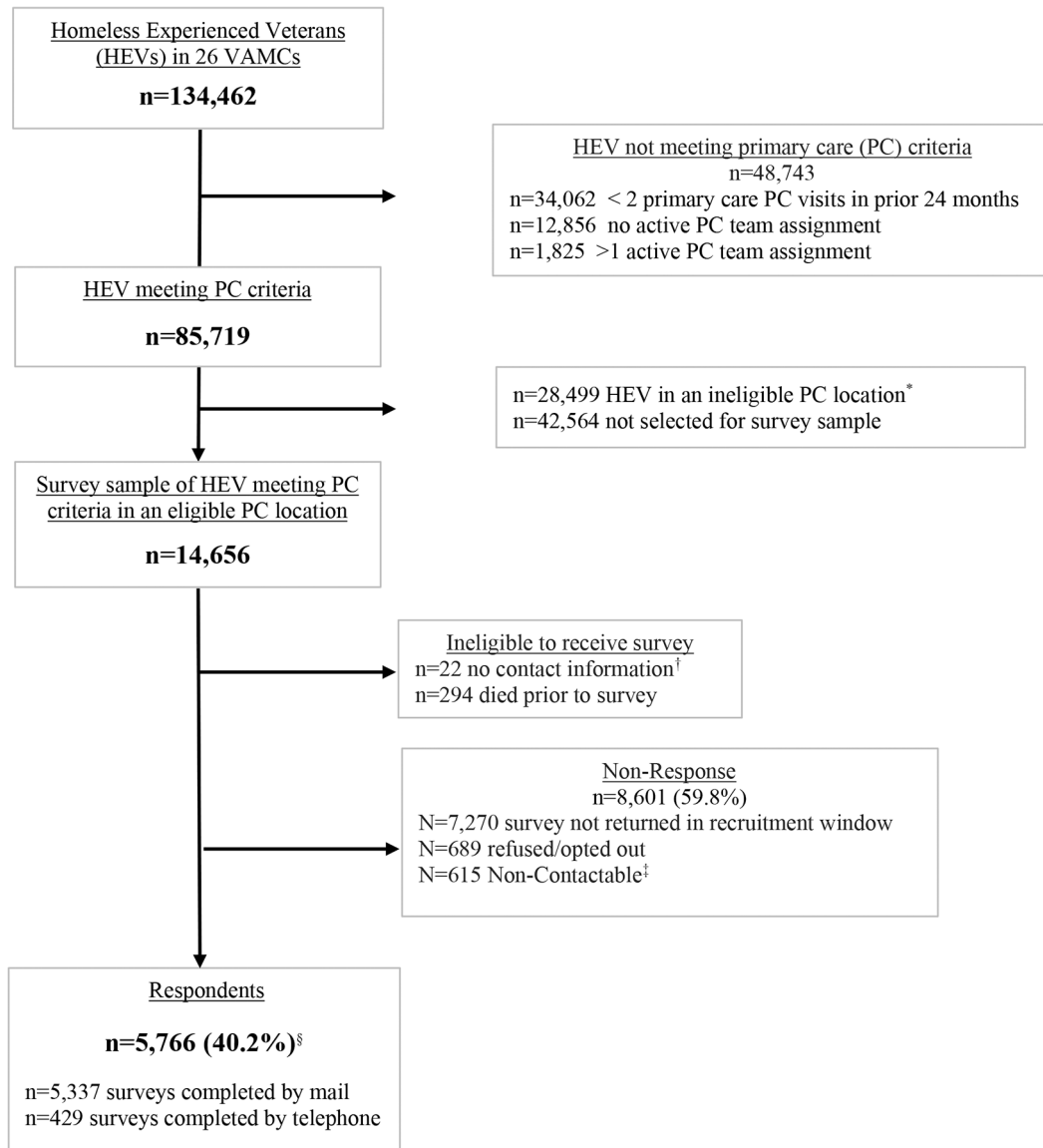
Figure 1: CONSORT Diagram of Inclusion/Exclusion Criteria and Survey Respondents in the PCQ-HoST study.

* Ineligible PC locations are clinics in locations without any Homeless-Patient Aligned Care Teams

† No address or telephone contact information in either VA administrative records or in commercially available address verification software. No attempt was made to reach these HEV.

‡ HEV who could not be reached by either mail (address missing or non-deliverable) or phone (incorrect number or disconnected)

§ Percentage is calculated based on a denominator (n=14340) which excludes the 316 HEV that were unable to receive survey
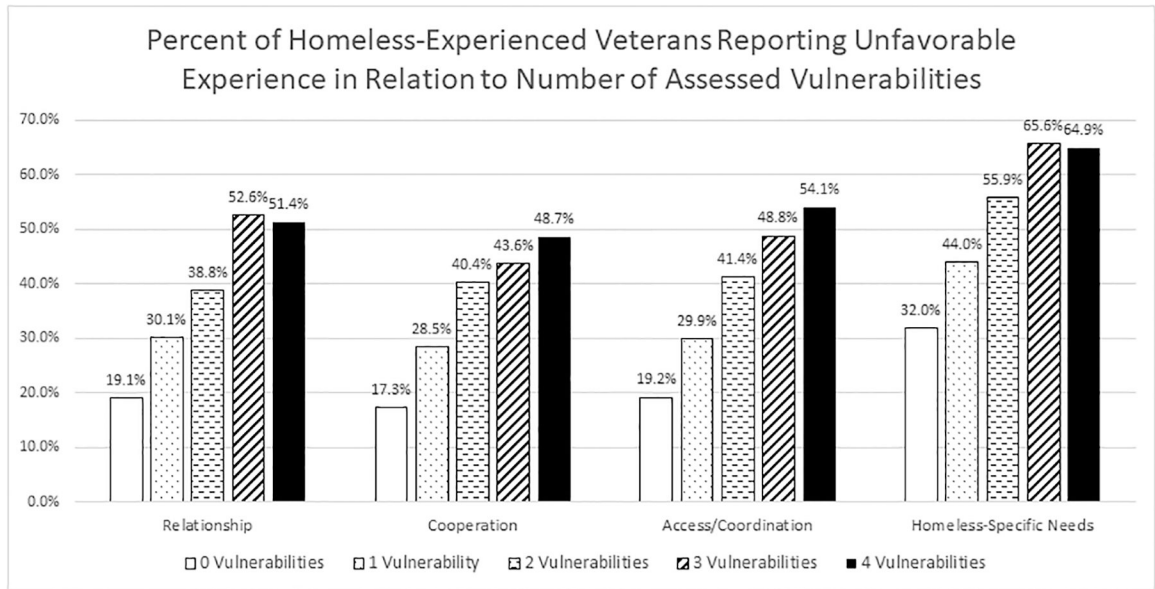
Figure 2: Unfavorable Experience and Vulnerability Count for Homeless-Experienced Veterans
Figure shows the percentage of homeless-experienced veterans (HEVs) qualifying for unfavorable experience on each of 4 patient-reported Primary Care Quality-Homeless (PCQ-H) scales, among all respondents regardless of clinic type: Relationship (3 unfavorable responses), Cooperation (2 unfavorable responses), Access/Coordination (3 unfavorable responses), and Homeless-Specific Needs (1 unfavorable responses). Vulnerabilities (minimum=0, maximum=4) were counted based on survey responses as follows: severe chronic pain (pain score 7 and bodily pain lasting longer than 3 months), unsheltered homelessness (self-report of 1 nights unsheltered in prior 6 months), severe psychological distress (score on a modified Colorado Mental Health Symptom Index score of 10 of 24), and self-report of drug or alcohol overdose in the preceding 3 years (self-report of having "an overdose where you needed to go to the emergency room or get medical care right away").
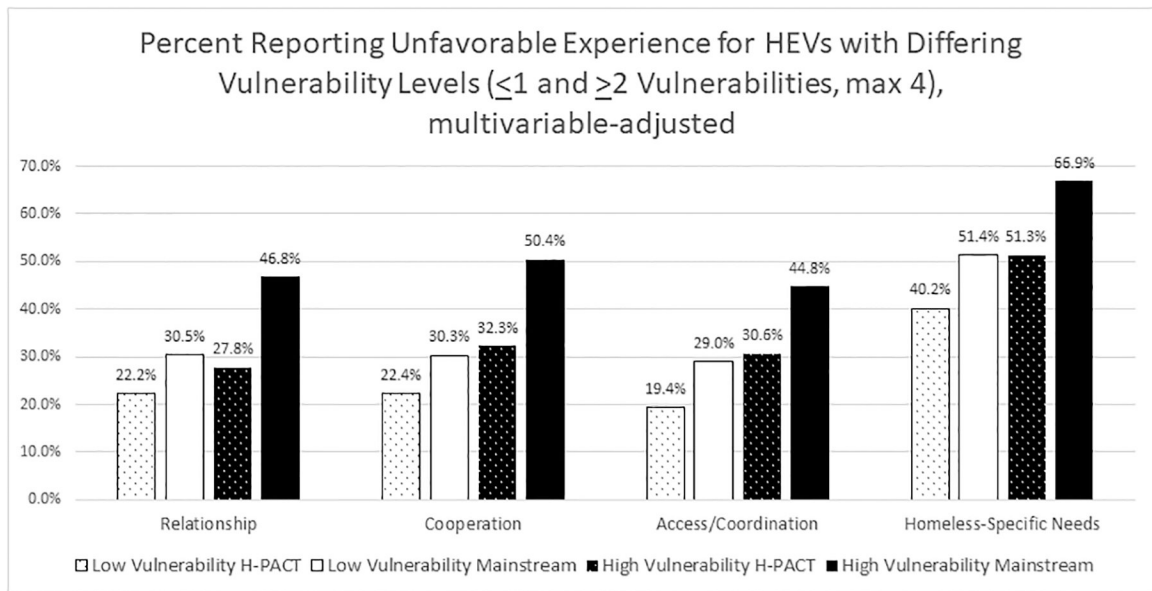
Figure 3: Interaction of Clinic Type and Vulnerability Status for Unfavorable Experience
Figure shows the percentage of respondents qualifying for unfavorable experience on each of the 4 patient-reported Primary Care Quality-Homeless (PCQ-H) scales: Relationship (≥3 unfavorable responses), Cooperation (≥2 unfavorable responses), Access/Coordination (≥3 unfavorable responses), and Homeless-Specific Needs (≥1 unfavorable responses). Low and high vulnerability were designated based on having ≤1 or ≥2 of the following: severe chronic pain (pain score ≥7 and bodily pain lasting longer than 3 months), unsheltered homelessness (self-report of ≥1 nights unsheltered in prior 6 months), severe psychological distress (based on combining the 4-item PHQ-4 and 2 items related to psychotic symptoms from the Colorado Mental Health Index, with a score of ≥10), and self-report of drug or alcohol overdose in the preceding 3 years (self-report of having "an overdose where you needed to go to the emergency room or get medical care right away"). Each multivariable-adjusted model is adjusted for age, gender, race, Hispanic/Latino ethnicity, chronic homelessness, low income (<$1000 per month), social support, number of medical conditions, the presence of an alcohol or drug use problem on the Two-Item Conjoint Screener, and receipt of psychiatric medication. For all 4 scales, p<0.0001 for the clinic type (H-PACT versus Mainstream) and vulnerability level (low versus high). The interaction of clinic type by vulnerability was significant at p<0.05 only for the Relationship and Cooperation scales.

Table 1.

Comparison of Homeless-Experienced Veterans Enrolled in Homeless Patient Aligned Care Teams (H-PACTs) versus Mainstream Primary Care (Mainstream PACT)

Characteristics[a]	Overall N=5766	H-PACT N=3394	Mainstream PACT N=2372	P Value[b]
	No. (%)	No. (%)	No. (%)	
Predisposing Factors				
Age, mean (SD)	58.7 (10.9)	57.9 (9.7)	59.9 (12.4)	<.001
Gender				
Male	5158 (90.7)	3153 (94.1)	2005 (85.8)	<.001
Female	506 (8.9)	185 (5.5)	321 (13.8)	
Other/transgender	24 (0.4)	14 (0.4)	10 (0.4)	
Hispanic or **Latinx**	602 (10.7)	358 (10.8)	244 (10.6)	.80
Race				
White	2367 (41.1)	1393 (41.0)	974 (41.1)	.96
African American	2252 (39.1)	1322 (39.0)	930 (39.2)	
Other	1147 (19.9)	679 (20.0)	468 (19.7)	
Enabling Factors				
Chronic homelessness[c]	1033 (17.9)	748 (22.0)	285 (12.0)	<.001
Unsheltered experience, last 6 months[d]	841 (14.6)	553 (16.3)	288 (12.1)	<.001
Social support, M(SD)[e]	4.3 (2.0)	4.2 (2.1)	4.5 (1.9)	<.001
Income <$1000/month	2237 (40.1)	1522 (46.2)	715 (31.3)	<.001
Need Factors				
Drug problem[f]	782 (13.8)	510 (15.3)	272 (11.7)	<.001
Alcohol problem[f]	1624 (28.7)	1017 (30.6)	607 (26.0)	<.001
Count of medical conditions (8 total), M (SD)[g]	1.9 (1.5)	1.8 (1.5)	1.98 (1.5)	<.001
Presence of severe psychological distress, last 2 weeks[h]	1724 (32.6)	1017 (32.7)	707 (32.4)	.809
Receipt of psychiatric medication in the last 30 days	1961 (34.7)	1145 (34.4)	816 (35.0)	.646
Severe chronic pain[i]	2193 (38.0)	1247 (36.7)	946 (36.7)	.016
Personal overdose experience in last 3 years[j]	379 (6.7)	245 (7.3)	134 (5.7)	.018
Count of Key Vulnerabilities[k]				
1 vulnerability	3899 (74.1)	2290 (74.0)	1609 (74.2)	.91
2 vulnerabilities	1363 (25.9)	803 (26.0)	560 (25.8)	

Notes

[a] *Missing information from survey response:* g*ender 78, ethnicity 142, income 182, drug problem 107, alcohol problem 107, overdose 72, psychological distress 478, social support 371, count of medical conditions 74, count of vulnerabilities 504*

[b] P values are from t-tests or Chi-square tests, as appropriate.

[c] *Chronic homelessness*: If a participant affirms either (a) having 4 separate instances of homelessness in the last 3 years or (b) affirming current homelessness with longest episode >1 year.

[d]*Unsheltered experience*: Participant spent 1 or more nights on the street, in a car, in an abandoned building in the 6 months prior to the survey

[e]*Social support*: This is the sum of 6 yes/no items, with 4 from "Emotional Support" in the National Institutes of Health Patient-Reported Outcomes Measurement Information System, one from its Social Isolation scale, and one referencing capacity to borrow $20, see Methods).

[f]*Alcohol or drug problem* is based on the Two-Item Conjoint Screening test, pertaining to the last 12 months.

[g]*Count of medical conditions:* count of eight self-reported medical conditions used in satisfaction studies from the Medical Expenditure Panel Survey

[h]*Psychological distress*: Based on combining the 4-item PHQ-4 and 2 items related to psychotic symptoms from the Colorado Mental Health Index, with a score of 10 (sum range 0–24), counted as "Severe" when sum 10, see Methods.

[i]*Severe Chronic Pain*: Participants who reported having bodily pain that of more than 3 months duration coupled with current pain 7 on a 0–10 scale

[j]*Overdose:* Affirming overdose on alcohol or drugs that necessitated immediate medical care in the last 3 years

[k]*Vulnerabilities: Four key vulnerabilities specified for analysis were:* severe chronic pain, severe psychological distress, unsheltered experience, and self-report of overdose. The count of vulnerabilities is restricted to persons informative for all four vulnerabilities queried.

Table 2.

Comparison of Primary Care Quality-Homeless Scores and Unfavorable Experience by H-PACT Status

	N[a]	H-PACT	Mainstream PACT	P Value
Scale Scores, Unadjusted[b]		Mean (SD)	Mean (SD)	
Relationship	5626	3.20 (0.56)	3.09 (0.60)	<.001
Cooperation	4993	2.79 (0.74)	2.65 (0.79)	<.001
Access/Coordination	5588	3.07 (0.52)	2.95 (0.55)	<.001
Homeless-Specific Needs	5064	3.02 (0.61)	2.82 (0.67)	<.001
Scale Scores, Weighted and Adjusted[c]		Estimate (SE)	Estimate (SE)	
Relationship	4345	3.21 (0.03)	3.05 (0.03)	<.001
Cooperation	3879	2.82 (0.04)	2.64 (0.04)	<.001
Access/Coordination	4312	3.07 (0.03)	2.92 (0.03)	<.001
Homeless-Specific Needs	3906	3.01 (0.03)	2.79 (0.03)	<.001
Unfavorable Experience, Unadjusted		No. (%)	No. (%)	
Relationship	5626	894 (26.9)	767 (33.3)	<.001
Cooperation	4993	828 (28.1)	747 (36.6)	<.001
Access/Coordination	5588	881 (26.7)	802 (35.1)	<.001
Homeless-Specific Needs	5064	1362 (43.6)	1046 (53.9)	<.001
Unfavorable Experience, Weighted and Adjusted[c]		Predicted Percentage (95% CI)	Predicted Percentage (95% CI)	
Relationship	4345	26.2 (22.6–29.7)	38.0 (33.7–42.3)	<.001
Cooperation	3879	27.9 (24.1–31.6)	39.3 (34.9–43.7)	<.001
Access/Coordination	4312	25.0 (21.4–28.6)	36.7 (32.3–41.0)	<.001
Homeless-Specific Needs	3906	48.3 (43.7–52.9)	60.9 (56.5–65.4)	<.001

Notes

[a]Numbers differ for each subscale based on a restriction in which scale scores were calculated only when 40% of the items applicable to a scale were responded to, based on the average of responses provided. The number of respondents for statistically adjusted results is lower due to missing responses on survey-derived covariates.

[b]Scales derived from the 33-item Primary Care Quality-Homeless survey.

[c]Modeled with multiple linear regression (for PCQ-H score) and logistic regression (for unfavorable experience). Multivariable-adjusted models control for age, along with the following variables based on survey response: gender, Latino/Hispanic ethnicity (yes/no), race, count of medical conditions (range 0–8), psychological distress score based on combining the 4-item PHQ-4 and 2 items related to psychotic symptoms from the Colorado Mental Health Index, with a score of 10 (sum range 0–24), counted as "Severe" when the sum 10. Alcohol and drug problems are based on the Two-Item Conjoint Screen, Social Support based on combining 6 items, with 4 from the National Institutes of Health PROMIS resource (see Methods), receipt of psychiatric medicine, severe chronic pain (based on a 2-item screener and reporting pain severity 7), unsheltered homeless experience, chronic homelessness, self-reported monthly income <$1000. All models apply inverse weights based on modeled propensity to respond to the survey based on VA clinical data for both respondents and non-respondents. All models treat location as a random effect.