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Development of the Primary Care Quality-Homeless (PCQ-H) Instrument: A Practical Survey of Patients' Experiences in Primary Care

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Abstract

Background—Homeless patients face unique challenges in obtaining primary care responsive to their needs and context. Patient experience questionnaires could permit assessment of patient-centered medical homes for this population, but standard instruments may not reflect homeless patients' priorities and concerns.

Objectives—This report describes (a) the content and psychometric properties of a new primary care questionnaire for homeless patients and (b) the methods utilized in its development.

Methods—Starting with quality-related constructs from the Institute of Medicine, we identified relevant themes by interviewing homeless patients and experts in their care. A multidisciplinary team drafted a preliminary set of 78 items. This was administered to homeless-experienced clients (n=563) across 3 VA facilities and 1 non-VA Health Care for the Homeless Program. Using Item Response Theory, we examined Test Information Function curves to eliminate less informative items and devise plausibly distinct subscales.

Results—The resulting 33-item instrument (Primary Care Quality-Homeless, PCQ-H) has four subscales: Patient-Clinician Relationship (15 items), Cooperation among Clinicians (3 items), Access/Coordination (11 items) and Homeless-Specific Needs (4 items). Evidence for divergent and convergent validity is provided. Test Information Function (TIF) graphs showed adequate informational value to permit inferences about groups for 3 subscales (Relationship, Cooperation and Access/Coordination). The 3-item Cooperation subscale had lower informational value (TIF<5) but had good internal consistency (alpha=0.75) and patients frequently reported problems in this aspect of care.

Conclusions—Systematic application of qualitative and quantitative methods supported the development of a brief patient-reported questionnaire focused on the primary care of homeless patients and offers guidance for future population-specific instrument development.

Introduction

On a single winter night in 2013, 610,042 Americans were counted as homeless, including 57,849 US military veterans,¹ a number considerably higher when homelessness is counted over the year.² The vulnerability of homeless individuals is reflected in excess mortality,³⁻⁶ hospital utilization,^{7,8} and poor health.⁹ Their access to health care is typically poor,¹⁰⁻¹² and they often feel unwelcome in care.¹³ Programmatic efforts to remediate access barriers began with Health Care for the Homeless Programs, first supported by private foundations and then by the US Department of Health and Human Services.¹⁴ In recent years, the US Department of Department of Veterans Affairs (VA) initiated 38 homeless-focused primary care programs.¹⁵ High quality primary care for homeless persons could, in principle, ameliorate disparities and produce cost offsets elsewhere (e.g., fewer emergency room visits, hospitalizations), and perhaps contribute to the reduction of homelessness.¹⁶

Assessing the provision of high quality primary care for homeless persons faces challenges of operationalization and measurement. Single-disease performance metrics can be problematic in their application to special or multi-morbid populations and in situations where the context of care should influence decision-making.¹⁷⁻¹⁹ Patient-centric approaches to primary care have gained in popularity, including Patient Centered Medical Homes (PCMHs) and the VA's Patient Aligned Care Teams (PACTs).²⁰ These changes in care delivery have contributed to increased interest in patient assessments of care and team-based care,²¹ and whether care approximates priorities identified by expert consensus groups (i.e., Institute of Medicine (IOM)). Relatively little is known about homeless patients' perceptions of key aspects of care such as accessibility, continuity, coordination, principles enshrined in the Consumer Assessment of Health Plans (CAHPS)²² and the Primary Care Assessment Survey (PCAS).²³

Administration of the CAHPS with PCMH items is required of federal Health Care for the Homeless programs seeking PCMH status, and CAHPS items are now used within VA's Survey of Health Experiences of Patients.²³⁻²⁵ These surveys are potentially problematic in application to homeless patients. The CAHPS presents 43 questions (1012 words) at a 9th grade reading level.²⁶ Twelve items are used to implement skips among the remaining 31 items, and 7 different response sets are used. For clients who are ill-rested or cognitively impaired, the risk of error or overload may be high. Questions may presuppose conditions and expectations that may not apply. More pressingly, specific concerns and aspirations important to homeless patients are likely to differ from the concepts queried in standard instruments, including the pressure to balance health care against competing demands,²⁷ perceptions of being unwelcome or adversely judged,^{13,28,29} mutual mistrust, and other unique constraints.³⁰

These concerns spurred development of a patient-reported primary care assessment instrument specifically designed to assess homeless patients' experiences in primary care, applicable in VA and non-VA settings alike. The purposes of this report were twofold: to portray the process and psychometrics supporting a new survey tool focused on primary care for homeless individuals; and to provide a portrait of the combined qualitative and

quantitative procedures that can support the development of patient-reported care surveys for patient populations with unique concerns and needs.

Methods

The method of instrument development proceeded from three assumptions about measurement of patient care in a homeless population. First, general constructs relevant to quality ought to derive from the IOM's definition of primary care³¹ and its Rules for Quality.³² This approach was embraced by the PCAS²³ and the Primary Care Assessment Tool (PCAT).³³ Second, homeless patients' needs and concerns are unique, requiring qualitative inquiry to guide item development.^{13,34} Third, to validate the results from these assumptions, the final instrument had to demonstrate adequate psychometric properties. Based on these assumptions, we sought to develop an instrument that was both sensitive to homeless patients' concerns and practical for administration in resource-constrained clinical settings such as Federally-Qualified Health Centers and volunteer clinics, in addition to more standard primary care and research contexts. The specific steps involved in the development of the instrument are detailed below and outlined graphically in Supplemental Digital Content Figure 1, Supplemental Digital Content 1 <http://links.lww.com/MLR/A742>.

1. Preliminary identification of constructs

Two reports from the IOM were used to preliminarily identify 16 constructs potentially appropriate for inquiry, with the expectation that these constructs would form the basis of subscales in the final instrument. These included the IoM's "Ten Rules for Quality"³² and elements from the IoM's definition of primary care.³¹ They include general concepts such as care being accessible and characterized by evidence-based decision-making.

2. Prioritization of constructs for inclusion

A card sort ranking exercise was used to narrow the 16 preliminary constructs to 8, a number addressable in qualitative interviews, described elsewhere.³⁵ Briefly, each of the constructs was restated in simple declarative form (e.g. the IoM priority of accessibility was "Primary care should be easy to get"). Patients (n=26) from homeless service settings and experts in homeless health care (n=10) were asked to sort the cards with their highest priority at top (Supplemental Digital Content Table 1, supplementary Digital Content 2 <http://links.lww.com/MLR/A743> . provides the working definition for each of the eight constructs emergent from this exercise).

3. Qualitative interviews

Based on the 8 prioritized constructs, semi-structured qualitative interviews were used to identify key themes for question content, supplemented by 4 focus groups to confirm themes related to unanticipated constructs that emerged from the interviews. Patient interviewees were recruited from a non-VA Health Care for the Homeless Program (n=20)³⁶ and from a VA hospital (n= 16). Additionally, 24 interviews were obtained from homeless care provider/experts (clinicians, administrators, and homeless researchers) from North America. Recruitment intentionally balanced veteran-focused with non-veteran focused

interviewees and frontline clinicians with researchers and program leaders. While patient-level interviews occurred in person, experts were often interviewed by telephone.

The interviews used a semi-structured guide that differed only slightly in the questions for patients and provider/experts. The typical qualitative interview prompt offered a brief, plain English restatement of the construct of interest using open-ended language to encourage new interpretations, including unanticipated constructs that might emerge. Thus a query related to “Care Based on Medical Evidence” was:

What do you think about the idea that your primary care should be based on the best medical knowledge?

Two follow-up probes were:

What makes you say that?

How about times when you didn't have a regular place to live? Did/does that make it different?

Interviewers were trained by a team of two experienced faculty (authors CH and DEP), including video-taped mock interviews, performance analysis, and feedback. Interviews were digitally recorded and transcribed. For both the qualitative interviews and the administration of PCQ-H version 1.0 reported below, participants underwent a structured informed consent with modest remuneration. All procedures were approved by Institutional Review Boards at all facilities involved with the study.

4. Qualitative analysis

Interviews were coded for themes to guide survey item development. The coding approach, Template Analysis^{37,38}, begins with identification of concepts within the investigators' a priori framework (in this case the IoM constructs).^{39,40} Coders worked independently only after achieving inter-rater reliability of 75%. For each overarching construct, 3-8 themes emerged inductively, often with subsidiary subthemes. Three entirely new constructs emerged as well (trust, homeless-specific needs, substance abuse/mental illness), producing a total of 11 constructs of interest for the anticipated survey. We reviewed all proposed themes, organizing and refining until consensus was reached.

5. Item generation

For each of the 11 constructs, 18-50 items were drafted based on our review of the most evocative qualitative interview quotes pertinent to each construct. All items were reviewed by a multidisciplinary team, with backgrounds in homeless primary care delivery, social work, psychology, nursing, medicine, and survey design. A consensus voting process prioritized 7 to 8 items per construct to provide a workable number for testing. The resulting 78 items underwent cognitive interviewing (n=12) to identify item interpretation problems. Only slight wording changes resulted from this exercise.

6. Administration for psychometric analysis and validation

The preliminary Primary Care Quality-Homeless survey (PCQ-H, version 1.0) included 78 items for 11 constructs (Table 1). To simplify administration in resource-poor environments

with low-literacy populations, the survey avoided skips and applied a uniform 4-point Likert-type response (Strongly Agree to Strongly Disagree, permitting “I don't know/no response” as an option). The survey was administered to 563 persons who used services at Health Care for Homeless Veterans programs at 3 VA facilities and 1 non-VA Health Care for the Homeless Program. Recruitment is detailed separately but summarized here.⁴¹ Eligibility was restricted to persons who had recorded evidence of past or current homelessness and 2 or more visits to a primary care provider in the past 2 years.

Two questionnaires were administered for divergent/convergent validity analyses. For divergent validity we projected weak or no correlation between the PCQ-H and scores from a construct that might represent a “rival hypothesis” for response patterns obtained; for this we used a short measure of distressing psychiatric symptoms validated in a large national homeless sample, the Colorado Symptom Index⁴² (the putative rival hypothesis: persons with psychological distress will give less favorable reports of primary care). For convergent validity, we used the PCAS, subject to the single-dimension scoring approach published by Roumie ($\alpha = 0.93$).^{23,43}

7. Item selection

Preliminary item reduction and scale collapsing—The results from survey administration to a 563-person sample supported an item reduction exercise to minimize length while exploring the statistical correlation of the 11 subscales. The intent of this process was to retain items that were informative across the range of the latent construct (a more or less favorable view of care with respect to the applicable subscale), and to avoid burdening respondents with correlated but fundamentally redundant items (“bloated specific” scales⁴⁴).

The steps to accomplish included a preliminary confirmatory factor analysis, but all subsequent work based on Item Response Theory (IRT). IRT offers advantages in shortening scales by separating consideration of informational value from item “difficulty”, i.e., the informational position along the dimension under study. While IRT pertains to a family of models, they share a common set of assumptions termed *unidimensionality* and *local independence*.⁴⁵ *Unidimensionality* presumes item responses are dependent upon a single underlying dimension common to all items in the test. *Local independence* assumes that conditional upon the underlying common trait, item responses should be uncorrelated. Although local dependence and multidimensionality (i.e. violations of the core assumptions) are related, it is possible that pairs of items could be correlated after controlling for the underlying trait, e.g., through redundancy in content. However, this dependence is not sufficient or not shared among enough items to appear as multidimensionality (i.e., it is local to the item pair).

In our analysis, we approached the unidimensionality assumption by first subjecting our items to the preliminary confirmatory factor analysis, then performing IRT models on subsets of items identified as loading on individual factors. We approached local dependence by carefully reviewing preliminary IRT model results and scrutinizing items with high loadings and overlapping item characteristic curves for redundancy in content, removing items with high redundancy.

The item reduction process was as follows:

First, 5 items were dropped where >10% of respondents could not answer, leaving 73 items. Second, for a *preliminary* assessment of scale correlation, confirmatory factor analysis was applied to all 73 items with factor loading based on the 11 hypothesized subscales/constructs, treating the items as ordered categories, using the Mplus default WLSMV estimation method.⁴⁶ While correlation between subscales is typical for patient questionnaires,^{23,24,47} to avoid excessive correlation subscales were merged until no pairwise correlation exceeded 0.8 (resulting in 4 subscales). However, subsequent work on the PCQ-H was not based on factor analysis. IRT (two parameter graded response analysis⁴⁸) was applied to identify items optimally discriminating across the range of the latent trait. The model permits calculation of the informational value for each item, relative to the inferred construct. The modeling accounts for both discrimination (the strength of the association between the item and the construct) and location (where along the spectrum of the construct an item is most informative). The informational value of a collection of items is presented as a test information function (TIF) curve, with the x-axis representing variation in the latent construct and the y-axis the informational value of a set of items. It was hypothesized that a minimum test information value of 5 permits inferences about groups, and 10 permits inferences about individuals (analogous to reliability of 0.8 and 0.9 respectively).⁴⁹ This portion of the analysis was conducted using the ltm package of the R programming environment.⁵⁰

Fourth, at each step in IRT analysis, TIF curves were reviewed, with focus on TIF values in the active range ($\theta = -1.5$ to $+1.5$). Fifth, automated algorithms were applied to retain items of maximum informational value, leaving 14 items. Because the resulting TIF curves consistently fell below 5, items were reinserted based on criteria. These included (a) retaining items with unfavorable responses from >13% of respondents (a cutpoint selected empirically after reviewing the range of unfavorable percentages), (b) retaining the 2 items most informative for each of original 11 constructs, and (c) removal of 3 items that were verbally and statistically redundant with other items.

Sixth, in order to assure that the internal consistency of the PCQ-H subscales could be compared to other published instruments,^{51,52} the commonly-used Cronbach's α was computed for each subscale, where an optimum of 0.7 or 0.8 is considered desirable for inferences concerning groups.⁴⁹ Because of its known limitations,⁵³ we also report McDonald's ω .⁵⁴ Finally, in light of prior studies suggesting a single higher-order factor often fits response patterns obtained from patient experience questionnaires,^{43,47,55} (permitting a single overall score with plausible fit to date⁴³), a single scale solution of all items was checked for adequacy.

Results

Construct Selection

From the cardsort exercise (step 2 above), the 8 most highly rated constructs targeted for qualitative interviews were: Accountability, Integration/Coordination, Evidence-Based Decision-Making, Accessibility, Patient as the Source of Control, Cooperation among

Clinicians, Continuous Healing Relationships, and Shared Knowledge and the Free Flow of Information. Additionally, 3 novel constructs emerged from qualitative interviews (Homeless-Specific Needs, Trust/Respect, Substance Abuse/Mental Illness). From themes emergent within these 11 constructs, 78 items were included in the development version of the PCQ-H.

Sample Characteristics

The sample of 563 persons administered the development version was racially diverse (58% Black, 31% White, 12% Other) with 14% women (Table 1). Military service was common (71%); 65% of respondents were recruited from VA settings. Although all respondents had a history of homelessness, few had slept in shelters or on the streets in the preceding 14 days (12%). However 65% had prior homelessness exceeding 1 year. All had ongoing primary care, with duration of care more than 2 years for 56% of respondents.

Psychometric validation

Serial merging of highly correlated scales and subsequent re-specification resulted in 4 subscales that served as the basis for the subsequent item response analysis. The decision to merge hypothesized subscales where correlations were very high ($r > 0.8$) meant that these 4 subscales varied in the number of retained items (Table 2). For example, the Patient-Clinician Relationship subscale (a combination of 7 hypothesized subscales) had 15 items, while the subscale reflecting perceptions of Cooperation among caregivers (derived from 1 hypothesized subscale) had 3 items.

Given that survey items used a 4-point response scale, the mean scores (Table 2) reflect a general tendency for patients to tend toward favorable as opposed to unfavorable ratings, a pattern reported with most other primary care instruments.^{52,56} The pairwise correlations among the 4 retained subscales (Table 3) remained substantial ($r = 0.51-0.78$), though not different from the benchmark CAHPS Adult Core Survey.²⁴

The “active” range for a TIF curve refers to the area where most respondents fall with respect to the modeled trait θ (in our sample, typically $-1.5 < \theta < 1.5$). TIF curves (Figures 1A – 1D) show that the informational value mostly exceeded the desired optimum of 5 in the active range for the Relationship, Access/Coordination and Homeless-Specific Needs Subscales. Peaks and valleys in the TIF curves indicated that for each subscale, the variation in item responses was more informative at certain locations with respect to the modeled trait θ . Very broadly this reflected greater informational precision (and firmer inferences) where θ was frankly low and frankly high, and less information for middling levels of θ .

The initial TIF curve for Cooperation met the study criterion of $TIF > 5$, but suffered from very redundant items (e.g. “My primary care and other health care providers are working together to come up with a plan to meet my needs” and “My health care is better because my primary care and other health care providers work together”). Three of the 6 items were dropped due to this semantic redundancy (with extremely correlated responses, $r > 0.7$). The resulting subscale was not highly correlated with the other three, and obtained high levels of dissatisfaction (Table 2). The TIF curve fell below the optimum of 5 (see Figure 2D), but Cronbach's α was acceptable at 0.75.

Within each subscale, internal consistency estimates were relatively high (Cronbach's $\alpha = 0.92, 0.75, 0.87, 0.76$ for Relationship, Cooperation, Access/Coordination, Homeless-Specific Needs), and $\alpha = 0.96$ for single 33-item summative scale.

For a single factor solution, based on all 33 retained items, the TIF curve exceeded 20 across the active range (image not shown). All TIF curves fell below the criterion of 5 at the extremes, where very few respondents were located.

Convergent validity was robust. The overall PCQ-H score correlated with Roumie's single factor-derived score for the PCAS ($r=0.73, p<.001$).^{23,43} There was extremely modest inverse correlation between psychiatric distress (Colorado Symptom Index) and overall PCQ-H score ($r=-0.13, p=0.002$), supporting divergent validity.

The final Primary Care Quality-Homeless (PCQ-H) instrument included 33 items, with a 7th grade reading level (694 words).

Discussion

Challenges such as poor accessibility,⁵⁷ uncoordinated care,⁵⁸ and feeling unwelcome¹³ in care are not unique to persons who are homeless, but they are often crucial barriers to appropriate care. With increasing interest in population-tailored service delivery models, the PCQ-H instrument should resonate for persons who have experienced homelessness. Questions regarding accessibility, for example, ask about outreach services, walking in for care (as opposed to telephoning for care, emphasized in the industry standard CAHPS), and payment barriers. Questions regarding patient-clinician relationship query matters of control, trust, respect, and perceptions of competence.

A substantial conceptual strength of our PCQ-H instrument lies in a development process that integrates 2 divergent survey development traditions that can be termed deductive (“top down”) and inductive (“bottom up”) approaches. Specifically, foundational surveys (including PCAT and PCAS^{23,33}) started with principles laid out by the IoM (including the notion that primary care be integrated, accessible, and continuous)³¹ followed by expert question design, subject later to cognitive response interviews, focus groups, and patient testing. While covering a range of expert-defined domains, this approach risks missing or underemphasizing constructs of concern to particular populations.

A contrasting “bottom up” tradition begins with qualitative inquiry among patients, exemplified by the Homeless Satisfaction with Care Scale (HSCS).⁵⁹ The HSCS team first queried “satisfaction” qualitatively. The resultant HSCS emphasizes respect, stigma and trust, although it does not query many experiential domains named by the IoM (e.g., continuity, coordination, cooperation). The PCQ-H, like the CAHPS, strives to query *patient experiences* (rather than the HSCS's “satisfaction”⁶⁰). However, as with the HSCS, qualitative inquiry from patients determined what would be queried.

The resulting 33-item PCQ-H attained criteria for convergent and divergent validity. Additionally, criterion validity is suggested by the finding that PCQ-H scores are higher in settings that tailor primary care service design to meet the needs of homeless patients.⁴¹ The

informational value for each subscale varies. If one adheres to the optimum standards for IRT analysis, inferences about groups ($TIF > 5$) can be made for all but the Cooperation subscale. Informational performance is strong enough to permit inference about individuals for the Relationship subscale and for the overall PCQ-H score ($TIF > 10$).

A potential limitation is that the 3-item Cooperation subscale fell short of the optimum $TIF > 5$ threshold. However the alpha of 0.75 is higher than that reported for 3 of the 5 scales finalized in the CAHPS 2.0 Adult Survey,²⁴ higher than most α 's computed for the CAHPS Patient Centered Medical Home instrument (0.61, 0.62, 0.68, 0.74, 0.85 and 0.91),⁶¹ and within the range of those reported for the PCAS (which ranged from 0.74-0.95).

Finally, the PCQ-H queries concepts described by patients and provider/experts through an extensive interview process. For example, questions about accessibility incorporate items focused on ease of walking in for care and expectations of outreach. Issues related to mental health and addiction issues, which featured prominently in our qualitative interviews, are queried through items designed to elicit concerns that are common in this population (e.g., fear of discrimination) while using language that does not require self-report of actually having a mental or addictive disorder.

Federal and state-level support for credentialing PCMH models within entities such as federally-qualified health centers (including Health Care for the Homeless programs)⁶² makes this instrument a potential asset to such initiatives. The PCQ-H, at 694 words in length with a 7th grade reading level (Flesch-Kincaid), is shorter and easier to read than the CAHPS Adult Survey with PCMH items. Internal consistency estimates (α) were higher than or similar to those published for the CAHPS adult core survey²⁴ and the clinician and group visit survey.⁵¹ In one clinical setting where both PCQ-H and CAHPS have been used for non-research purposes (with roughly 200 patients responding to each), the PCQ-H was described by patients as straightforward, while the CAHPS necessitated frequent questions from patients unsure of how to respond.⁶³

Limitations to the PCQ-H and its development should be acknowledged. First, our reliance on 3 VA samples and a health care program from a state with universal Medicaid limited our capacity to carefully test item performance in relation to financial accessibility. In order to assure that the resulting instrument would remain applicable in settings with financial barriers, some items related to financial accessibility were retained. Additionally, while the instrument met study criteria for validity, the stability of response over time remains unclear, pending a formal test-retest assessment.

Acknowledging these limitations, certain unique strengths apply to the instrument development process as well. Most notably, while the PCQ-H was designed to capture domains prioritized in IoM consensus reports, item creation was uniformly preceded by systematic qualitative inquiry with homeless-experienced patients and providers.

We believe the PCQ-H should serve as an asset to care providers and payers wishing to assure that organizations funded to care for homeless patients tailor services for this population. Absent an appropriate patient-reported measure, it will remain possible for agencies to secure homeless health care funding without optimizing accessibility (as has been

reported¹²⁾ or other dimensions important to the homeless. One question for future homeless health care design is whether patient ratings of their own care predict better process or outcome measures or more contextually appropriate decisions.⁶⁴ Pending such research, however, a strong case can be made that measuring homeless patients' experiences aligns with a societal interest in fostering medical homes for all populations.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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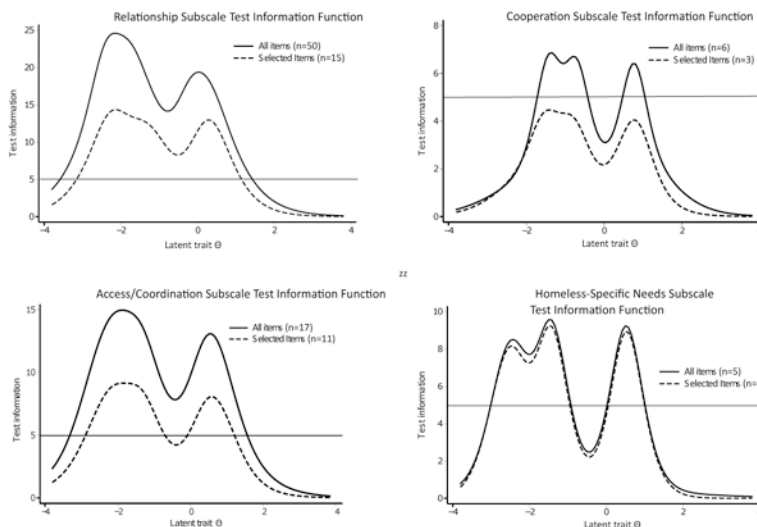


Figure 1. Depiction of Test Information Function curves, by subscale, for the initial set of items field-tested (solid lines) and for the items selected after reduction (dotted lines). The “latent trait” θ refers to the underlying strength of satisfaction for the relevant trait, with θ for most persons falling between -1.5 and +1.5, with small numbers falling outside these bounds. For the Patient-Clinician Relationship subscale, 5.2% of respondents had latent trait value θ -1.5, and 8.2% had θ +1.5. For the (perceived) Cooperation subscale, 7.9% had latent trait value θ -1.5, and 17% had θ +1.0. For the Access/Coordination subscale, 2.5% had latent trait value θ -1.5, and 8.7% had θ +1.5. For the Homeless-specific needs subscale, 4.5% had latent trait value θ -1.5 and 16% had θ +1.0.

Table 1
Description of the Primary Care Quality–Homeless Survey Development Sample

Characteristics	N = 563
Age [mean (SD)] (y)	53.2 (8.2)
Gender	
Female, %	14.4
Male, %	84.9
Transgender/other, %	0.7
Race	
African American, %	57.7
Native American, Asian, Pacific Islander, %	2.1
White, %	30.6
Other, %	9.6
Hispanic/Latino, %	5.3
Chronically homeless in past 3 years, %	68.2
Spent 1 or more nights in street, car, abandoned building, or emergency shelter, last 2 weeks, %	12.1
General health status is fair or poor, %	42.9
Psychiatric symptom intensity (Colorado Symptom Index), last 6 months* [mean (SD)]	16.4 (11.2)
Any illicit drug use, past 3 months, %	32.9
Any alcohol use, past 3 months, %	22.6
Duration of primary care relationship >2 years, %	56.4

* The Colorado Symptom Index ranges from 0–56.

Table 2
Primary Care Quality-Homeless (PCQ-H) Survey Items Organized by Subscale^{1,2}

Subscales (Mean Score ± SD)	Unfavorable Response ³ (%)	IRT Parameter Estimates			
		a	b1	b2	b3
Patient-Clinician Relationship (3.3 ± 0.5)					
1 My PCP never doubts my health needs.	15	1.914	-2.334	-1.428	0.234
2 My PCP takes my health concerns seriously.	15	3.781	-2.330	-1.828	-0.289
3 My PCP makes decisions based on what will truly help me	5	3.599	-2.418	-1.743	-0.117
4 I feel my PCP has spent enough time trying to get to know me.	17	2.965	-2.304	-1.108	0.167
5 I can get in touch with my PCP when I need to.	23	1.835	-2.201	-1.040	0.653
6 I can get enough of my PCP's time if I need it.	17	2.503	-2.130	-1.223	0.504
7 If my PCP and I were to disagree about something related to my care, we could work it out.	6	2.792	-2.417	-1.719	0.358
8 My PCP makes sure health care decisions fit with the other challenges in my life.	9	3.262	-2.301	-1.436	0.310
9 I worry about whether my PCP has the right skills to take good care of me.	16	1.796	-2.493	-1.400	0.311
10 I can be honest with my PCP if I use drugs or alcohol.	6	2.153	-2.883	-2.004	0.027
11 I worry my PCP might report my health information to the authorities.	7	1.151	-4.092	-2.607	0.499
12 Someone from my PCP's office returns my phone calls or pages.	10	1.617	-2.762	-1.806	0.825
13 When I need information about my health care, like test results, I can get it easily.	9	1.752	-3.121	-1.778	0.659
14 The staff at this place listens to me.	7	2.020	-2.676	-1.852	0.669
15 Staffs at this place treat some patients worse if they think that they have addiction issues.	12	1.377	-2.922	-1.705	0.627
Cooperation (2.9 ± 0.7)					
16 My primary care and other health care providers need to communicate with each other more.	45	2.038	-1.510	-0.158	1.400
17 I have been frustrated by lack of communication among my primary care and other health care providers.	24	4.344	-1.417	-0.721	0.776
18 My primary care and other health care providers are working together to come up with a plan to meet my needs.	15	1.687	-2.498	-1.363	0.663
Access/Coordination (3.1 ± 0.5)					
19 My PCP helps to reduce the hassles when I am referred to other services.	11	2.246	-2.542	-1.423	0.552
20 I have to wait too long to get the health care services my PCP thinks I need.	23	1.676	-1.963	-1.077	0.935
21 At this place, I have sometimes not gotten care because I cannot pay.	4	1.200	-4.522	-3.049	0.132
22 If I could not get to this place, I think the staff would reach out to try to help me get care.	14	2.438	-2.050	-1.218	0.685
23 If I walk-in to this place without an appointment, I have to wait too long for care.	29	1.328	-2.313	-0.900	1.587
24 This place is open at times of the day that are convenient for me.	6	2.258	-2.710	-1.878	0.494

Subscales (Mean Score ± SD)	Unfavorable Response ³ (%)	IRT Parameter Estimates		
		a	b1	b2 b3
25 This place helps me get care without missing meals or a place to sleep.	11	2.682	-2.273	-1.361 0.528
26 It is often difficult to get health care at this place.	7	2.331	-2.596	-1.691 0.358
27 This place tells me about what services are available.	11	3.044	-2.042	-1.331 0.408
28 The health care services I need are close to each other.	13	1.966	-2.505	-1.458 0.837
29 If my PCP is unavailable there is someone else that can help me.	8	2.440	-2.402	-1.589 0.796
Homeless-Specific Needs (3.1 ± 0.5)				
30 This place tries to help me with things I might need right away, like food, shelter or clothing.	11	3.353	-2.228	-1.328 0.494
31 The people who work at this place seem to like working with people who have been homeless.	8	3.768	-2.490	-1.445 0.471
32 If I miss an appointment, this place still finds a way to help me.	8	3.329	-2.826	-1.496 0.623
33 At this place, I always have to choose between health care and dealing with other challenges in my life.	27	0.921	-3.729	-1.274 1.749
Primary Care Quality-Homeless Overall Score (PCQ-H-33) (3.2 ± 0.4)				

¹This tabular summary of items is not designed for direct administration in clinic settings. A version with complete introductory language, response options, and variable names is available from the authors. Response options ranged from strongly agree (value of 4) to strongly disagree (value of 1), with reverse-scoring applied to negatively worded items (items 9, 11, 15, 16, 17, 20, 21, 23, 26 and 33). Scoring for each subscale reflects computation of the mean obtained value among items available, provided at least 50% of items for each subscale have obtained a valid response.

2.2. Calculated indices of internal consistency/reliability (Cronbach's α , McDonald's ω) are as follows: **Patient-Clinician Relationship** (0.92, 0.96); **Cooperation** (0.75, 0.85); **Access/Coordination** (0.87, 0.94); **Homeless-Specific Needs** (0.76, 0.88).

³The "unfavorable response" is present when an individual offered "Strongly Disagree"/"Disagree" for positively worded items or "Strongly Agree"/"Agree" for negatively worded items (items 9, 11, 15, 16, 17, 20, 21, 23, 26 and 33).

Table 3
Estimated Correlations among Primary Care Quality-Homeless Survey Subscales

Subscale	1. Patient-Clinician Relationship	2. Cooperation	3. Access/Coordination
1. Patient-Clinician Relationship			
2. Cooperation	0.66		
3. Access/Coordination	0.78	0.65	
4. Homeless-Specific Needs	0.66	0.51	0.69

Source: Responses to Primary Care Quality-Homeless Survey, N = 563.

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