Evidence Synthesis Program

Engaging Veterans Experiencing Homelessness in Primary Care

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PREFACE

The VA Evidence Synthesis Program (ESP) was established in 2007 to conduct timely, rigorous, and independent systematic reviews to support VA clinicians, program leadership, and policymakers to improve the health of Veterans. ESP reviews have been used to develop evidence-informed clinical policies, practice guidelines, and performance measures; to guide implementation of programs and services that improve Veterans' health and wellbeing; and to set the direction of research to close important evidence gaps. Four ESP Centers are located across the US. Centers are led by recognized experts in evidence synthesis, often with roles as practicing VA clinicians. The Coordinating Center, located in Portland, Oregon, manages program operations, ensures methodological consistency and quality of products, engages with stakeholders, and addresses urgent evidence synthesis needs.

Nominations of review topics are solicited several times each year and submitted via the ESP website. Topics are selected based on the availability of relevant evidence and the likelihood that a review on the topic would be feasible and have broad utility across the VA system. If selected, topics are refined with input from Operational Partners (below), ESP staff, and additional subject matter experts. Draft ESP reviews undergo external peer review to ensure they are methodologically sound, unbiased, and include all important evidence on the topic. Peer reviewers must disclose any relevant financial or non-financial conflicts of interest. In seeking broad expertise and perspectives during review development, conflicting viewpoints are common and often result in productive scientific discourse that improves the relevance and rigor of the review. The ESP works to balance divergent views and to manage or mitigate potential conflicts of interest.

ACKNOWLEDGMENTS

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Operational Partners

Operational partners are system-level stakeholders who help ensure relevance of the review topic to the VA, contribute to the development of and approve final project scope and timeframe for completion, provide feedback on the draft report, and provide consultation on strategies for dissemination of the report to the field and relevant groups.

Thomas O'Toole, MD
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Technical Expert Panel

To ensure robust, scientifically relevant work, the technical expert panel (TEP) guides topic refinement; provides input on key questions and eligibility criteria, advising on substantive issues or possibly overlooked areas of research; assures VA relevance; and provides feedback on work in progress. TEP members included:

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Disclosures

This report was prepared by the Evidence Synthesis Program Center located at the **VA Providence Health Care System,** directed by Eric Jutkowitz, PhD and James Rudolph, MD and funded by the Department of Veterans Affairs, Veterans Health Administration, Health Systems Research.

The findings and conclusions in this document are those of the author(s) who are responsible for its contents and do not necessarily represent the views of the Department of Veterans Affairs or the United States government. Therefore, no statement in this article should be construed as an official position of the Department of Veterans Affairs. The final research questions, methodology, and/or conclusions may not necessarily represent the views of contributing operational and content experts. No investigators have affiliations or financial involvement (*eg*, employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties) that conflict with material presented in the report.

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ABBREVIATIONS TABLE

Abbreviation	Definition
aOR	Adjusted odds ratio
aRD	Adjusted risk difference
CWT	Compensated Work Therapy
DCHV	Domiciliary Care for Homeless Veterans
GERIPACT	Geriatric PACT
GPD	Grant and Per Diem
GRADE	Grading of Recommendations Assessment, Development and Evaluation
HCHV	Health Care for Homeless Veterans
HCRV	Health Care for Re-entry Veterans
HPACT	Homeless Patient Aligned Care Team
HUD-VASH	US Department of Housing and Urban Development-VA Supportive Housing
HVCES	Homeless Veteran Community Employment Services
ICD	International classification of disease
KQ	Key question
MD	Mean difference
MeSH	Medical subject headings
MOST	Multiphase optimization strategy
NR	Not reported
NRCS	Nonrandomized comparative studies
OR	Odds ratio
PACT	Patient Aligned Care Team
PCMH-SHEP	Patient-Centered Medical Home-Survey of Healthcare Experiences of Patients
PCQ-H	Primary Care Quality-Homeless survey
RCT	Randomized controlled trial
RD	Risk difference
SD	Standard deviation
SRDR+	Systematic Review Data Repository
SSVF	Supportive Services for Veteran Families
TEP	Technical expert panel
VA	Department of Veteran Affairs
VHA	Veterans Health Administration
VJO	Veteran Justice Outreach

BACKGROUND

Veterans experiencing housing insecurity (collectively Veterans with a history of homelessness, currently experiencing homelessness, or at risk for homelessness) are a vulnerable population in which racial and ethnic minorities are disproportionately represented.[i] [1,2] Most Veterans experiencing housing insecurity are male, but female Veterans may be more likely to experience housing insecurity and have more unmet health and social needs.[3,4] Although placing Veterans experiencing housing insecurity in permanent housing is the priority, these Veterans still have a need for health care. Conceptually, housing security and health are interrelated.[5] Housing insecurity may lead to increased risk of poor social and health outcomes due to stress, poor access to clean water and proper hygiene, and exposure to the elements.[5] Simultaneously, poor health, financial difficulties, and untreated substance misuse can lead to housing insecurity.[6]

Physical illness, mental illness, and substance use diagnoses are all more common among Veterans experiencing housing insecurity than matched stably housed people.[7-10] Medical and social needs of Veterans experiencing housing insecurity can be managed with outpatient care.[11-13] In addition, several studies have found that connecting Veterans experiencing housing insecurity with primary care may result in more appropriate (and less costly) health service utilization.[14, 15] However, Veterans experiencing housing insecurity may be hesitant to seek primary care services due to factors such as lack of trust of the health care system or concerns about stigma.[16] Hesitancy to seek primary care may also contribute to Veterans experiencing housing insecurity using acute care more than stably housed Veterans.[11-13]

Ending Veteran homelessness is a priority of the US Department of Veteran Affairs (VA).[17, 18] To end Veteran homelessness, the VA has invested billions of dollars in specialized homeless services including the US Department of Housing and Urban Development-VA Supportive Housing (HUD-VASH), Health Care for Homeless Veterans (HCHV), Grant and Per Diem (GPD), Supportive Services for Veteran Families (SSVF), Domiciliary Care for Homeless Veterans (DCHV), Homeless Veteran Community Employment Services (HVCES), Compensated Work Therapy (CWT), Health Care for Re-entry Veterans (HCRV), and Veteran Justice Outreach (VJO).[19-23] These investments may have contributed to the 47% decrease in the number of homeless Veterans seen between 2010 to 2017.[19] However, recent data suggest a reversal in this trend. Between 2022 and 2023, there was a 7.4% increase in homelessness among Veterans.[24]

To improve Veteran care, the VA implemented the Patient Aligned Care Team (PACT) initiative in 2010. PACT is a team-based method of care that encourages collaboration and coordination between health care providers while building a partnership with Veterans.[25-27] Teams of health care professionals work with Veterans to provide needed health care services.[25] Since the implementation of

[i] Studies used inconsistent terminology to describe the population of Veterans experiencing homelessness or at risk of homelessness. Throughout the report we chose to use the term "Veterans experiencing housing insecurity."

the PACT initiative, several programs have been developed for specialized populations, including Homeless Patient Aligned Care Teams (HPACT). HPACT functions in a similar way to traditional PACT but incorporate additional team members such as social workers, substance use counselors, and homeless program staff, who offer services that can help lead to permanent supportive housing.[27,28] In addition, HPACT may also include walk-in clinics or extended hours, integrated services such mental health services, continuity of care across the VA and community agencies through team-based care, and staff with specialized training in homeless care.[29]

Given that Veterans experiencing housing insecurity have a high prevalence of a variety of physical and behavioral health diagnoses, it is important to understand the effect of establishing primary care on these individuals' health and housing stability. Therefore, the Veterans Health Administration (VHA) Office of the Assistant Undersecretary for Health - Clinical Services requested the following systematic review to examine the impact of primary care services, including PACT and HPACT, on health care utilization and other outcomes in Veterans experiencing housing insecurity.

METHODS

TOPIC DEVELOPMENT

We worked with representatives from the VHA Office of the Assistant Undersecretary for Health - Clinical Services and our technical expert panel (TEP) to refine the key questions (KQ). We focused on studies that included Veterans experiencing housing insecurity (literal homelessness, history of homelessness or at risk for homelessness) and examined the effect of receiving primary care on Veteran-reported outcomes (*eg*, satisfaction), clinical outcomes (*eg*, binary indicators for chronic disease management), health service use outcomes (*eg,* emergency department use), and housing outcomes (*eg,* loss of housing). We evaluated these outcomes separately for Veterans enrolled in VA homeless programs (HUD-VASH, HCHV, GPD, SSVF, DCHV, HVCES, CWT, HCRV, or VJO) that provide housing or social support. In addition, we evaluated the effect of receiving primary care on outcomes for all Veterans experiencing housing insecurity regardless of enrollment in any VA homeless program.

KEY QUESTIONS AND PROTOCOL

The following KQs were the focus of this review:

Key Question 1	Among Veterans enrolled in VA programs for those experiencing housing insecurity[a], what is the effect of receiving primary care through PACT and/or HPACT on Veteran-reported, clinical, health service use, and housing outcomes?
Key Question 2	Among Veterans experiencing homelessness or at risk for homelessness, what is the effect of PACT and/or HPACT on Veteran-reported clinical, health service use and housing outcomes?

Notes. [a] VA homeless programs include US Department of Housing and Urban Development-VA Supportive Housing (HUD-VASH), Health Care for Homeless Veterans (HCHV), Grant and Per Diem (GPD), Supportive Services for Veteran Families (SSVF), Domiciliary Care for Homeless Veterans (DCHV), Homeless Veteran Community Employment Services (HVCES), Compensated Work Therapy (CWT), Health Care for Re-entry Veterans (HCRV), or Veteran Justice Outreach (VJO).

A protocol for this review was registered on the PROSPERO international prospective register of systematic reviews (CRD42024537730). The review followed the PRISMA guidelines. A draft version of this report was reviewed by external peer reviewers; their comments and author responses are located in the Appendix.

SEARCHING AND STUDY SELECTION

We searched Ovid Medline, Cochrane, PsycINFO, CINAHL, Scopus, and ClinicalTrials.gov from inception until March 26, 2024. We used Medical Subject Headings (MeSH) and free text terms relevant to *homelessness*, *VA supportive housing programs*, *primary care*, *patient aligned care teams*, and *Veterans* (see Appendix A for complete search strategies). We ensured that known relevant publications were captured by our searches. Additional citations were sought from hand-searching reference lists of relevant systematic reviews and consultation with content experts.

Citations were uploaded into EndNote and deduplicated. We screened citations in Systematic Review Data Repository (SRDR+) (https://srdrplus.ahrq.gov/). To ensure a common understanding of the eligibility criteria, we ran a pilot round of 100 citations, where all team members screened the title and abstract of the same citations, and conflicts were resolved as a group. After this, citations were

screened in duplicate, and conflicts were resolved by group discussion or by the lead researcher. Abstracts accepted at the screening phase underwent full-text review by 2 independent reviewers, with conflicts resolved by an additional team member. Appendix B lists the studies excluded at full-text review phase, along with the reason for their exclusion.

Study eligibility criteria are shown in Table 1. In brief, eligible studies included US Veterans experiencing housing insecurity. For KQ 1, we focused on studies of Veterans enrolled in HUD-VASH, HCHV, GPD, SSVF, DCHV, HVCES, CWT, HCRV, or VJO (VA programs that provide Veterans experiencing housing insecurity with various services and supports; *eg,* HUD-VASH provides Veterans with a housing voucher and wrap-around clinical support; CWT provides Veterans with vocational rehabilitation). For KQ 2, we focused on studies of Veterans experiencing housing insecurity regardless of enrollment in any specific VA homeless program. Both KQs focused on Veterans aged 18 and older.

Eligible studies evaluated the effect of VA primary care including PACT or HPACT on prioritized outcomes (described below). Studies were excluded if they consisted of home-based primary care, Geriatric PACT (GERIPACT), community primary care (*ie,* primary care outside the VA), or TriCare. Comparators of interest included Veterans experiencing housing insecurity not receiving primary care or not enrolled in PACT or HPACT, usual primary care (*eg,* standard VA primary care or PACT), or no comparator. We analyzed Veteran-reported outcomes such as unmet medical needs, unmet supportive care needs, or satisfaction with VA; disease-specific outcomes, including binary indicators of chronic disease management and referrals to specialty services (present or absent); food insecurity outcomes; health care utilization outcomes; and housing outcomes. Based on consultation with the nominator and technical expert panel, continuous measures of chronic disease management were excluded (*eg,* change in hemoglobin A1C). We included randomized controlled trials (RCT), non-randomized comparative studies (NRCS), and non-comparative (single group) studies of any design except case reports/series and qualitative research. We required at least 10 participants per intervention (*eg,* PACT or HPACT). If an RCT reported a comparison of interest (*eg,* PACT vs usual primary care) that was not randomized, we evaluated the study as a NRCS. If a RCT or NRCS included 1 eligible arm and 1 noneligible arm (*eg,* non-Veterans), we included the eligible arm as a "single group" study.

Table 1. Eligibility Criteria

	Inclusion Criteria	Exclusion Criteria
Population	KQ 1: US Veterans enrolled in HUD-VASH, HCHV, GPD, SSVF, DCHV, HVCES, CWT, HCRV or VJO KQ 2: US Veterans experiencing housing insecurity (homelessness, history of homelessness or at risk for experiencing homelessness)	<18 years of age
Intervention	Receipt of primary care including PACT or HPACT, or usual primary care in the VA	Enrollment in home-based primary care, GERIPACT, community primary care, or TriCare
Comparator	KQ 1: Veterans not receiving primary care or not enrolled in PACT or HPACT, or no comparator KQ 2: Alternative program (*ie,* HPACT vs. PACT), other or no health care (*ie,* neither HPACT nor PACT), or no comparator	• Non-Veteran comparison groups • Health care exclusively outside the VA • Stably housed Veterans

	Inclusion Criteria	Exclusion Criteria
Outcomes	Veteran-reported outcomes • Unmet medical or supportive care needs • Experience/satisfaction with VA Disease-specific outcomes • Binary indicators for chronic disease quality measures (*eg,* proportion of Veterans with diabetes meeting care management goals) • Referrals to specialty care and receipt of mental health and substance use treatment Food insecurity Health service use and housing • Emergency department, inpatient care, or acute psychiatric hospitalization • Housing outcomes (*eg*, loss of supportive housing or positive transition out of supportive housing) • Utilization of homeless service programs • Return on investment or cost effectiveness	• Continuous measures of chronic disease management
Timing	Any	
Setting	Any	
Study Design	RCTs NRCS Single group (including baseline and follow-up, and noncomparative) studies	• Case report/case series • Qualitative research studies • Protocols
Other	>10 people meeting inclusion criteria	

Abbreviations. CWT=Compensated Work Therapy; DCHV=Domiciliary Care for Homeless Veterans; GERIPACT=Geriatric Patient Aligned Care Teams; GPC=Grant and Per Diem; HCHV=Health Care for Homeless Veterans; HCRV=Health Care for Re-entry Veterans; HUD-VASH=US Department of Housing and Urban Development-VA Supportive Housing; HVCES=Homeless Veteran Community Employment Services; KQ=key question; NRCS=non-randomized comparative study; PACT=Patient Aligned Care Teams; SSVF=Supportive Services for Veteran Families; VJO=Veteran Justice Outreach.

DATA EXTRACTION, ASSESSMENT, AND SYNTHESIS

We created a data extraction form in SRDR+. We extracted the following data from eligible studies: study design, sample size, and study participant characteristics at baseline, primary care program type, and outcomes of interest. All data was extracted by 1 reviewer and then confirmed by a second reviewer, with consultation from other team members as needed.

Study risk of bias was independently assessed by 1 reviewer and confirmed by a second using questions derived from the Cochrane Risk of Bias tool for RCTs and Risk of Bias In Non-randomized Studies – of Intervention tool for other study design (Appendix C). For all study designs, we also evaluated whether the article was free of discrepancies and whether patient eligibility criteria, protocols, setting, and outcome assessment were reported clearly. For RCTs, we considered the methods of randomization and allocation concealment and whether intention-to-treat analysis was used. For NRCSs, we evaluated the similarity of patients in the treated and comparison groups and the strategies used to deal with potential confounders. Studies with low overall risk of bias had no concerns in all domains or unclear risk of bias in 1 domain. Studies with moderate overall risk of bias

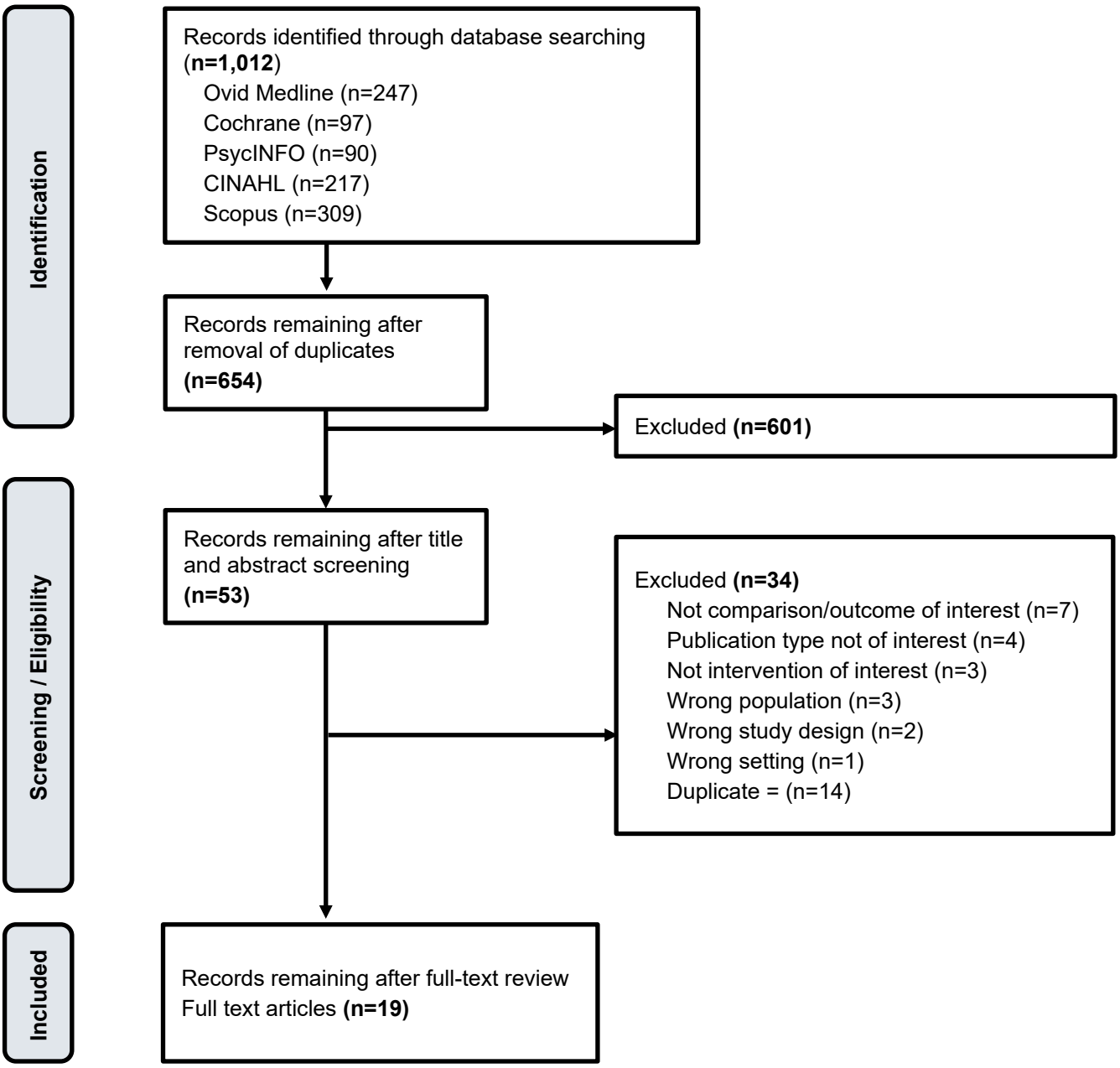
had unclear risk of bias for ≥2 domains and high risk of bias for only 1 domain. Studies with high overall risk of bias had concerns in ≥2 domains. In general, single group studies that do not explore within-group changes from before to after an exposure are vulnerable to biases and provide limited information on treatment effects (*eg*, of primary care on outcomes for Veterans experiencing housing insecurity). Therefore, results of single group studies that did not include within-group comparisons were considered at high risk of bias.

We conducted a narrative synthesis of the evidence. We aimed to meta-analyze quantitative data, but this was not feasible. We compared results in study groups using odds ratios (OR) for dichotomous outcomes. When a study had 0 events in 1 group, we calculated risk differences (RD). We compared continuous data using mean differences (MD) between interventions. Adjusted analyses were preferentially extracted over unadjusted (crude) comparisons. We assessed the certainty of evidence following the GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach.[30] We compiled key study findings in evidence profiles, which provide the basis for determination of certainty of evidence and summarize conclusions for outcomes. Within each outcome, we considered the study design, the number of studies and participants, methodological limitations, directness of the evidence, precision of the findings, consistency across studies, and other issues. Single group studies without pre and post data were excluded from our GRADE assessments. For outcomes with insufficient evidence, the summary finding for that outcome is "no conclusion."

RESULTS

LITERATURE FLOW DIAGRAM

The literature flow diagram summarizes the results of the study selection process. Of 654 records screened, 52 were accepted for full-text review, of which 19 primary studies were eligible and included. Reasons for exclusion included not reporting comparison or outcomes of interest ($N = 7$), publication type not of interest ($N = 4$), no intervention of interest ($N = 3$), wrong population ($N = 3$), ineligible study design ($N = 2$), wrong setting ($N = 1$), or duplicate citations ($N = 14$). A full list of excluded studies is provided in Appendix B.



OVERVIEW OF INCLUDED STUDIES

Four studies evaluated the effect or association of engaging Veterans experiencing housing insecurity in primary care (*ie,* yes or no primary care), and 15 studies compared outcomes for Veterans experiencing housing insecurity in homeless-tailored primary care to standard or usual primary care (*eg,* HPACT vs PACT). Table 2 shows the study design and summary characteristics of the eligible studies. Appendix D presents study design details, and Appendix E presents baseline characteristics. The studies were published between 2006 and 2021; they included 115,844 participants (range = 123 to 51,886). There were 12 NRCSs and 7 studies evaluated as a single group design; no RCTs compared interventions of interest. Across the 19 studies, most participants were men (85% to 97%), and most participants were on average between 45 and 64 years of age.

Homeless-tailored primary care was labeled differently in the literature (*eg,* HPACT, homeless oriented primary care, and integrated primary care) but typically consisted of a combination of physical health care, mental health care, substance use treatment, and social services for Veterans experiencing housing insecurity. When studies did not specifically use the term HPACT, we used the term homeless-tailored primary care for consistency and clarity. Three studies used data from the Patient-Centered Medical Home-Survey of Healthcare Experiences of Patients (PCMH-SHEP), which is an ongoing survey of Veteran primary care experiences conducted by the VHA.[31] Two of these studies used data from the 2014-2015 survey, though they included different comparison groups.[32,33] The remaining studies used data from VA electronic medical records. One study exclusively included Veterans enrolled in a named VA homeless program (HUD-VASH),[34] and 18 studies included Veterans experiencing housing insecurity regardless of enrollment in a named VA homeless program. The 19 studies used different methods to identify Veterans experiencing housing insecurity. This included identifying Veterans experiencing housing insecurity through a combination of ICD codes and VA homeless service use ($N = 8$), enrollment in HPACT or specialized primary care ($N = 5$), though the McKinney–Vento Act or Stewart B. McKinney Homeless Assistance Act criteria ($N = 3$), ICD codes only ($N = 1$), several of these definitions ($N = 1$), and enrollment in a named VA homeless program only ($N = 1$) (Appendix F).

Table 2. Summary Characteristics of Eligible Studies (*N* = 19)[a]

Characteristics	
Design	*Number of Studies*
NRCS[b,c]	12
Single group[d]	7
Sample Source	*Number of Studies*
Medical center	7
National	9
VISN	1
Other	2
Method of Homelessness Identification	
Combination of ICD codes and VA homeless service use	8
Enrollment in HPACT or specialized primary care	5
McKinney–Vento Act or Stewart B. McKinney Homeless Assistance Act criteria	3
ICD codes only	1

Characteristics	
Enrollment in a named VA homeless program	1
Multi-criteria definition	1
Risk of Bias	
Low	5
Moderate	8
High	6
Baseline Details	
Sample size range (*N* = 19)	123 to 51,886
Male % range (*N* = 18)	84.6 to 97%
Age	
Mean age range (*N* = 12)	48.4 to 59.5
Age range (*N* = 5)	18-65+ (Majority aged 45-64)
Age not reported (*N* = 2)	-
Race (% range)	
Studies reporting majority of patients White (*N* = 14)	37.7 to 80.8%
Studies reporting majority of patients Black (*N* = 3)	51.6 to 66.7%
Studies not reporting race information (*N* = 2)	-

Notes. [a]Data only includes homeless group study arms; [b]One post hoc analysis of an RCT was analyzed as an NRCS; [c]One NRCS was evaluated as a single group study and as an NRCS for different questions of interest; [d] Four NRCS were evaluated as single group studies since the comparator groups were not of interest (Chang, 2020; Jones, 2017; O'Toole, 2013; Trivedi, 2018).

Abbreviations. NRCS=nonrandomized comparative study; HPACT=homeless patient aligned care teams; ICD=international classification of disease; VISN=Veterans Integrated Service Networks.

EFFECT OF ENGAGING VETERANS EXPERIENCING HOUSING INSECURITY IN PRIMARY CARE

Four studies (2 NRCSs with 1 RCT evaluated as an NRCS, 2 single group with 1 NRCS evaluated as a single group) that were conducted in the VA between 2006 and 2017 involved 14,967 participants and evaluated outcomes for Veterans experiencing housing insecurity engaged in primary care (*ie,* yes or no primary care).[29,34-36] Two studies evaluated care in Veterans experiencing housing insecurity new to primary care. That is, Veterans who were not established or engaged in primary care prior to enrolling in specialized homeless primary care. Specifically, 1 study compared Veterans before and after enrollment in homeless-oriented primary care, and also compared these individuals to a historic sample of Veterans experiencing housing insecurity that received care from a general VA internal medicine clinic.[36] Of note, in this section we only report results from this study for the within-group changes for Veterans before and after enrollment in homeless-oriented primary care (*ie,* evaluated as a single group study). In the next section (homeless-tailored primary care versus usual primary care), we report this study as an NRCS.

Another study compared Veterans across 33 VHA medical centers before and after HPACT enrollment.[29] The remaining 2 studies compared Veterans experiencing housing insecurity that did and did not access primary care during the period of observation.[34, 35] One of these 2 studies was a post-hoc

analysis of individuals in an RCT (randomized to receive a brief personalized health assessment, a clinic/health system orientation, or a combination of the 2 versus usual care),[37] which we evaluated as an NRCS (*ie,* yes or no primary care). Only 1 study exclusively analyzed participants in a named VA homeless program (HUD-VASH).[34] The studies evaluated outcomes over different time periods. One study compared outcomes 7 to 12 months after enrollment in homeless-tailored primary care to outcomes during the first 6 months of enrollment,[36] 1 study compared outcomes 6 months before and after enrollment in HPACT,[29] 1 study compared Veterans who accessed primary care within 1 month of study enrollment compared to those who did not,[35] and 1 study compared Veterans who accessed primary care over a 1 year period to those who did not.[34]

In 2 studies, the majority of participants were White (62.0% and 80.8%),[19, 35, 36] 1 study reported that the majority of participants were Black (57.2%),[34] and 1 study did not report information about race. Mean age in the 4 studies ranged from 48.4 to 52.9 years old, and most participants were male (93.6% to 95.9%). The 4 studies reported multiple comorbidities. In 1 study, 15.2% of Veteran had ≥1 mental health diagnosis.[34] In 2 studies, approximately 55% had depression, and 33.3% and 46.5% had anxiety.[35, 36] One study reported that 31.0% of participants had posttraumatic stress disorder,[35] and 1 study reported that 19.2% had bipolar disorder and 7.3% had schizophrenia.[36] In 1 study, 6.3% had at least 1 substance use disorder,[34] and 2 studies reported alcohol use (67.6% and 64.4%), marijuana (33.1% and 12.9%), cocaine (13.4% and 28.8%) and heroin (7.9%) use disorders. The single group study did not report information on mental health or substance use services at baseline. One study also reported that 11.8% of Veterans had diabetes, 44.1% had hypertension, and 42.4% had hyperlipidemia.[36] The other 3 studies did not report data on these chronic conditions.

One NRCS reported results from an unadjusted analysis (therefore, moderate risk of bias).[35, 36] Three studies had no methodological concerns (therefore, low risk of bias).[29, 34, 36] Appendix C shows the full risk of bias assessments.

In summary (Table 3), available studies found that engaging Veterans experiencing housing insecurity in primary care may reduce emergency department visits and hospitalizations (moderate confidence). Primary care visits of those newly established in primary care may be high at first and then decrease over time (low confidence). Studies provided insufficient evidence for the impact of establishing Veterans experiencing housing insecurity in primary care on housing and community integration outcomes (no conclusion). No study reported data on specialty/other care, patient experiences, satisfaction, cost or return on investment, or disease-specific outcomes at different time points.

Table 3. Summary of Findings for the Effect of Engaging Veterans Experiencing Housing Insecurity in Primary Care

Outcome	Studies (Patients); Design	Methodological Limitations	Indirectness	Imprecision	Inconsistency	Other Issues	Summary	Overall Confidence
Primary Care[36]	1 (177); NRCS[a]	Low[c]	Direct	Precise	NA[b]	Single study	Primary care use may be high at first and then decrease over time.	Low
Emergency Care[29, 36]	2 (14265); 1 NRCS[a] 1 Single group	Low[c]	Direct	Precise	Inconsistent[d]	None	Establishing primary care may reduce emergency department visits.	Moderate
Inpatient Care[29, 36]	2 (14265); 1 NRCS[a] 1 Single group	Low[c]	Direct	Precise	Inconsistent[e]	None	Establishing primary care may reduce hospitalizations	Moderate
Specialty/Other Care	NR	NR	NR	NR	NR	NR	NA	No evidence
Cost and Return on Investment	NR	NR	NR	NR	NR	NR	NA	No evidence
Housing and Community Integration and Food Insecurity[34,35]	2 (702); 2 NRCSs	Moderate[f]	Direct	Precise	Inconsistent[e]	NR	No conclusion[g]	Insufficient
Patient Experience/ Satisfaction	NR	NR	NR	NR	NR	NR	NA	No evidence
Disease-Specific Outcomes	NR	NR	NR	NR	NR	NR	NA	No evidence

Notes. [a]NRCS evaluated as a single group study for this question; [b]Single study; [c]As a single group, this study was rated as low risk of bias; [d]One study reported a reduction in overall visits from before to after enrollment, and another study reported mixed results for change in visits from the first 6 months of enrollment to 7-12 months after enrollment for both overall emergency department visits and appropriateness of visits; [e]Assessment of different outcome definitions; [f]One study was rated as moderate risk of bias for using a crude analysis; [g]One study reported no difference in all outcomes between groups, and 1 study reported no difference in most outcomes but favored primary care group for 1 outcome.

Abbreviations. N/A=not applicable; NR=not reported; NRCS=non-randomized comparative study.

Primary Care

Two single group studies reported the number of primary care visits for housing-insecure Veterans who received primary care. One NRCS evaluated as a single group study found significantly fewer primary care visits per Veteran 7 to 12 months after enrollment homeless-tailored primary care compared to the first 6 months of enrollment (MD = -3.95, 95% CI [-2.73, -5.17], $p < 0.01$).[36] The study did not report the change in primary care encounters for Veterans before and after enrolling in homeless-oriented primary care. A second single group study did not report baseline data but observed an average of 3.4 primary care visits over 12 months for Veterans enrolled in HPACT.[29]

Emergency Department Utilization

All-Cause Emergency Department Utilization

Two single group studies reported emergency department utilization for Veterans experiencing housing insecurity who received primary care.[29, 36] One single group analysis (of a larger NRCS) of Veterans enrolled in homeless-tailored primary care found a significant decrease in the proportion of Veterans with an emergency department visit for any cause from 0 to 6 months after enrollment to 7 to 12 months after enrollment (55.3% to 36.8%, $p < 0.01$). The average number of emergency department visits per Veteran did not significantly decrease between periods (MD = -0.55, 95% CI [-1.32, 0.22]). The study did not report data on emergency department utilization before enrollment in homeless-tailored primary care.

Another single group study reported a 19% reduction in emergency department visits in the 6 months after compared to before HPACT enrollment (significance not reported).[29]

Appropriate Emergency Department Utilization and Cause-Specific Emergency Department Utilization

One single group of Veterans enrolled in homeless-tailored primary care found a significant decrease in the proportion of Veterans using emergency department care for non-emergencies from 0 to 6 months after enrollment to 7 to 12 months after enrollment (22.4% to 13.2%, $p < 0.02$).[36] However, the proportion of all emergency department visits that were for non-emergency care did not significantly decrease between periods (23.6% of visits to 18.5%, $p = 0.39$). The average number of non-emergency emergency department visits per Veteran also did not significantly decrease between periods (MD = -0.18, 95% CI [-0.46, 0.10]), nor did the average number of substance abuse-related emergency department visits per Veteran (MD = -0.03, 95% CI [-0.49, 0.43]).[36]

Inpatient Hospitalizations

Two studies reported hospitalization outcomes.[29, 36] A single group found no significant difference in the mean number of all-cause hospitalizations 7 to 12 months after enrollment in homeless-tailored primary care compared to 0 to 6 months after enrollment (MD = 0.01, 95% CI [0.32, 0.34]). In contrast, the proportion of hospitalizations not related to drug or alcohol use or mental health significantly decreased between periods (28.6% to 10.8%, $p < 0.01$).[36]

A single group study found a 34.7% decrease in hospitalizations in the 6 months after compared to before HPACT enrollment (significance not reported).[29]

Specialty/Other Care Utilization

One single group study reported Veterans had an average of 1.5 specialty care clinic visits over 12 months of enrollment in HPACT (standard deviation and significance not reported). This study did not report specialty care utilization prior to enrollment in HPACT.[29]

Cost, Return on Investment, and Satisfaction

No study reported cost, return on investment, or Veteran satisfaction with care.

Housing and Community Integration and Food Insecurity

Two NRCSs reported housing or community integration outcomes for Veterans who received primary care. One NRCS that analyzed Veterans enrolled in HUD-VASH reported no significant differences in community adjustment (aOR = 1.01, 95% CI [0.98, 1.04]), housing stability (aOR = 1.00, 95% CI [0.95, 1.05]), or employment (aOR = 0.96, 95% CI [0.88, 1.06]) between Veterans who did and did not access primary care.[34] One NRCS (which was a post hoc analysis of individuals included in an RCT) found a significantly lower odds of living in unstable housing or moving into unstable housing for Veterans experiencing housing insecurity who accessed primary care within 1 month of study enrollment compared to those who did not access primary care (OR = 0.38, 95% CI [0.16, 0.95]).[35] Veterans who accessed primary care appeared to have higher odds of moving to stable housing, but this difference was nonsignificant (OR = 2.03, 95% CI [0.91, 4.54]). The odds of remaining in stable housing were similar between groups (OR = 1.03, 95% CI [0.52, 2.01]).

Disease-Specific Outcomes

One single group study evaluated as a single group study found that most Veterans achieved their target blood pressure goal (78.8%), diabetes care goal (57.1%) and lipid management goal (65.4%) 6 months after enrolling in homeless-oriented primary care.[36]

EFFECT OF HOMELESS-TAILORED PRIMARY CARE VERSUS USUAL PRIMARY CARE

Sixteen studies (10 NRCSs and 6 single group studies) compared homeless-tailored primary care to usual primary care.[14,15,31-33,36,38-47] Studies were conducted between 2011 and 2021 and involved 114,965 participants. All but 1 study explicitly included Veterans with a history of being established or engaged in primary care prior to enrolling in the homeless-tailored primary care.[14,15,31-33,36,38-40,42-47] Comparisons varied across the 10 NRCSs. Six compared Veterans in homeless-tailored primary care to standard primary care.[15,39,40,43,44,47] One NRCS compared Veterans from the first 6 months of enrollment in homeless-tailored primary care to 7 to 12 months after enrollment in primary care and to a historical sample of seasonally matching Veterans experiencing housing insecurity that received care from a general VA internal medicine clinic.[36] Two NRCS compared Veterans in HPACT to similar Veterans in the same medical center but not enrolled in HPACT (but assumed to be participating in primary care), and also to similar Veterans enrolled in standard primary care at medical centers without HPACT.[14, 32] Finally, 1 NRCS compared Veterans in medical centers with HPACT to medical centers without HPACT. In this study, it was unclear whether the Veterans in medical centers with HPACT were enrolled in HPACT.[41]

Six studies were evaluated as a single group design.[31,33,38, 42,45,46] Of these, 4 included a comparison group that did not meet the review criteria.[35,38,45,46] Two single group studies included Veterans before

and after enrollment in HPACT[42] or other homeless-tailored primary care.[33] In these 2 studies, Veterans were enrolled or participated in usual primary care prior to enrollment in homeless-tailored primary care.

In 13 studies, most participants were White (range =38%–80.8%),[15,26,31-33,36,39-43,45-47] while 2 studies reported that most participants were Black (range = 52%–67%),[14, 44] and 1 study did not report information on race.[38] In 9 studies, the mean age was between 49.1 to 59.5 years,[14,15,36,40,43-47] and in 5 studies most participants were between 45 and 64 years of age (range = 18–65+).[31-33,39,41] Two studies did not report the age of participants.[38, 42]

Thirteen studies reported a wide range of mental health diagnoses or use of psychiatric medication at baseline (range = 8%–97%). [15,31-33,36,39-43,45-47] The same 13 studies reported substance use disorder from a low of 2% for sedative/hypnotic use or treatment[42] to a high of 74.8% for any reported substance use disorder.[33] Five studies reported hypertension ranged from 19% to 51%[15,36,39,45,46] and 4 studies reported diabetes ranged from 8% to 25%.[36,39,45,46]

Five studies comparing homeless-tailored primary care to usual care had high risk of bias. Four of these were single group studies that only reported follow-up data without baseline data [31,38,45,46] One NRCS was considered at high risk of bias due to concerns about the comparator representativeness and unclear reporting or discrepancies in the study.[14] Eight studies (all NRCS) had moderate risk of bias. Five of these studies used self-reported outcomes where participants were not blinded to the intervention[15,32,39,41,43]; 1 study had unclear reporting, incomplete outcome data, and concerns about the comparator representativeness[47]; 1 conducted unadjusted analyses[44]; and 1 study had concerns about the comparator representativeness.[36] Three studies had no concerns and were judged to be at low risk of bias.[33,40,42]

In summary (Table 4), available studies provided insufficient evidence (no conclusion) on the effect of homeless-tailored primary care on primary care utilization or overall specialty care utilization compared with usual primary care. Homeless-tailored primary care may reduce inpatient hospitalizations and emergency department visits and increase appropriate use of emergency care (low confidence). Homeless-tailored primary care may reduce mental health and substance use visits (low confidence). Homeless-tailored primary care may increase primary care costs and reduce emergency department and overall costs (low confidence). There is no evidence for a difference in disease-specific outcomes for patients in homeless-tailored primary care compared to usual care (low confidence). Veterans experiencing housing insecurity in tailored primary care rate their experience better than those in usual care (low confidence). Available studies did not evaluate housing and community integration outcomes.

Table 4. Summary of Findings for the Effect of Homeless-Tailored Primary Care versus Usual Primary Care[a]

Outcome	Studies (Patients); Design	Methodological Limitations	Indirectness	Imprecision	Inconsistency	Other Issues	Summary	Overall Confidence
Primary Care[14,15,36,42]	4 (52508); 3 NRCS and 1 single group	Moderate[b]	Direct	Precise	Inconsistent[c]	None	No conclusion	Insufficient
Emergency Care[14,15,33,36, 2]	5 (52631); 3 NRCS and 2 single group	Moderate[d]	Direct	Precise	Inconsistent[e]	None	Homeless-tailored primary care may reduce emergency department use and lead to more appropriate emergency department use.	Low
Inpatient Care[15,33,36,42]	4 (745); 2 NRCS and 2 single group	Moderate[f]	Direct	Precise	Inconsistent[g]	None	Homeless-tailored primary care may reduce hospitalizations.	Low
Specialty/ Other Care[14,15,33,40,42]	5 (55297); 3 NRCS and 2 single group	Moderate[h]	Direct	Precise	Inconsistent[i]	None	No conclusion for effect of homeless-tailored primary care on specialty visits, but homeless-tailored primacy care may reduce mental health and substance care (potentially because these services are embedded in tailored primary care).	Low
Cost and Return on Investment[15]	1 (266); NRCS	Moderate	Direct	Precise	N/A[j]	Single Study	Homeless-tailored primary care may increase primary care costs and reduce emergency department and overall costs.	Low
Housing and Community Integration and Food Insecurity	NR	NR	NR	NR	NR	NR	NA	No evidence
Patient Experience/Satisfaction[15,32,39,41,43,44]	6 (31434); NRCS	Moderate[k]	Direct	Precise	Inconsistent[l]	None	Higher patient experience for homeless-tailored primary care.	Low
Disease-Specific Outcomes[36,47]	2 (19782); NRCS	Moderate[m]	Direct	Precise	Inconsistent[n]	None	No evidence of a difference.	Low

Notes. [a]We did not GRADE data from 4 single group studies without baseline and follow-up data; [b]One study was high risk of bias due to unclear reporting and concerns about comparator representativeness, 2 studies had moderate risk of bias due to concerns about comparator representativeness and blinding, and 1 study was low risk of bias; [c]Mixed findings: 1 study reported more visits in HPACT versus PACT to primary care providers but not primary care teams, another study reported more visits in the last 6 months compared to a general internal medicine clinic, 1 study reported an increase in primary care visits after PHACT enrollment, and 1 study reported a decrease in visits from before to after enrollment, but that change was smaller than those not enrolled in HPACT at HPACT sites and not different from those in usual care, and the time points of these outcomes differed; [d]One study was high risk of bias due to unclear reporting and concerns about comparator representativeness, 2 studies were moderate risk of bias due to concerns about comparator representativeness and blinding, and 2 were low risk of bias; [e]Mixed results for both within- and between-group changes (either a decrease or no difference in emergency department visits), and outcomes included all-cause visits and appropriateness of visits; [f]Two studies were moderate risk of bias due to concerns about comparator representativeness and blinding, and 2 were low risk of bias; [g]Two studies reported a reduction in hospitalization from before to after enrollment. Two studies reported mixed results; [h]One study was high risk of bias due to unclear reporting and concerns about comparator representativeness, 1 had moderate risk of bias due to concerns about blinding, and 3 were low risk of bias; [i]The definition for specialty care varies across studies, and outcomes across these were mixed; [j]Single study; [k]Five studies were moderate risk of bias due to concerns about blinding and 1 study had moderate risk for conducting a crude analysis; [l]Four of 6 studies reported more positive patient experiences in at least 1 assessed domain related to care, and 2 other studies reported no differences

between groups; [m]Both studies rated as moderate risk of bias due to concerns about comparison group or unclear blinding of outcome assessor and incomplete outcome data; [n]One study reported no difference in overdose outcomes in homeless-tailored primary care versus other primary care and another study found no difference in the proportion of patients meeting blood pressure, diabetes, or lipid management goals, and time points of these comparisons differed.

Abbreviations. N/A=not applicable; NRCS=non-randomized comparative study.

Primary Care

Six studies (3 NRCS and 3 single group) reported on primary care use among Veterans experiencing housing insecurity participating in homeless-tailored primary care compared to similar Veterans in usual primary care. One NRCS found significantly more primary care physician encounters over 2 years among Veterans enrolled in HPACT compared to PACT (MD = 1.5, 95% CI [0.5, 2.5], p = 0.001).[15] The overall number of combined primary care physician and nursing visits also appeared to differ between groups, but this difference was not statistically significant (MD = 1.7, 95% CI [-0.10, 3.50], p = 0.06).[15]

One NRCS found more primary care visits 7 to 12 months after enrollment in HPACT compared to a historical group of similar Veterans enrolled in non-tailored general internal medicine.[36] The study reported this difference to be significant (p = 0.05) but the calculated confidence interval did not show significance (MD = 0.7, 95% CI [-0.01, 1.46]).

The third NRCS reported the change in primary care visits 6 months before and after enrollment in HPACT among Veterans experiencing housing insecurity with 2 or more emergency department visits during the baseline period.[14] The study also compared the change in primary care visits from the 6 months to the second 6 months of 2012 in 2 other groups. The first was Veterans at the same medical center who were not enrolled in HPACT. The second comparison group was Veterans in medical centers that did not have HPACT. [14] There was a significant reduction in the number of primary care visits 6 months after compared to before HPACT enrollment (MD = -0.012, p = 0.015). This change was significantly different than the change in the number of primary care visits for Veterans in medical centers with HPACT but not enrolled in HPACT (difference-in-differences = -0.012, p < 0.001) but not significantly different than change in visits for Veterans in medical centers without HPACT (difference-in-differences = -0.02, p = 0.23).[14]

One single group study found a large significant increase in the odds of having a primary care encounter both 0 to 6 months and 7 to 12 months after HPACT enrollment compared to the 6 months prior to enrollment, with greater odds during the 0 to 6 month period (0 to 6 months aOR = 4.91, 95% CI [2.94, 8.20]; 7 to 12 months aOR = 2.30, 95% CI [1.42, 3.72]).[42] The same study found a significant increase in the number of primary care visits 12 months after HPACT enrollment compared to 12 months before enrollment (MD = 1.13, 95% CI [0.57, 1.69], p < 0.001).[42]

Two single group studies reported Veteran primary care utilization after enrollment in HPACT or homeless-tailored primary care without data on utilization prior to enrollment.[38, 45] On average, Veterans in HPACT or homeless-tailored primary care had between 7.7 and 8.4 primary care visits (12 months follow-up in 1 study and 6 months follow-up in 1 study).

Emergency Department Utilization

All-Cause Emergency Department Utilization

Three NRCSs and 4 single group studies reported all-cause emergency department utilization. One NRCS found no significant difference in the odds of having an all-cause emergency department visit between Veterans in HPACT and PACT from June 2012 to January 2014 (OR = 0.83, 95% CI [0.48, 1.42]).[15] This study also found no significant difference in the mean number of emergency department visits between Veterans in HPACT and PACT (MD = -0.3, 95% CI [-1.4, 0.8], p = 0.57).

One NRCS compared the change in emergency and urgent care visits 6 months before and after enrollment in HPACT among Veterans experiencing housing insecurity with 2 or more emergency department visits during the baseline period.[14] The study also compared this change to the change in emergency and urgent care from the first 6 months to the second 6 months of 2012 in similar Veterans at the same medical center who were not enrolled in HPACT, and also to a group of similar Veterans in medical centers that did not have HPACT. There were significantly fewer emergency department visits per Veteran per month in the 6 months after HPACT enrollment compared to the 6 months before enrollment (MD = -0.061, $p < 0.001$). However, this change was not significantly different from the change in emergency department visits for similar Veterans at HPACT sites who were not enrolled in HPACT (difference-in-differences = -0.02, $p = 0.27$) or similar Veterans at medical centers without HPACT (difference-in-differences = -0.09, $p = 0.89$).

One NRCS found no significant difference in the proportion of Veterans with an emergency department visit 7 to 12 months after enrollment in homeless-tailored primary care compared to a historical comparison of homeless Veterans who used non-tailored general internal medicine during the last 6 months of 2012 (OR = 0.84, 95% CI [0.46, 1.55]).[36] The same study found no significant difference in the number of emergency department visits per Veteran 7 to 12 months after enrollment in homeless-tailored primary care compared to a historical comparison of homeless Veterans who used general internal medicine (MD = 0.32, 95% CI [-0.22, 0.86]).

One single group study reported significantly lower adjusted odds of emergency department visits in Veterans 0 to 6 months and 7 to 12 months after HPACT enrollment compared to the 0 to 6 months before HPACT enrollment (0 to 6 months aOR = 0.57, 95% CI [0.34, 0.94] and 7 to 12 months aOR = 0.55, 95% CI [0.33, 0.91]).[42] In an unadjusted analysis, the study found no significant difference in the mean number of emergency department visits in the 12 months after HPACT enrollment compared to 12 months before enrollment (MD = 0.15, 95% CI [-0.28, 0.58]).

Another single group study compared emergency department utilization in the 4 quarters before and after enrollment in an integrated primary care clinic, which addressed factors related to social determinants of health and substance use prevention, assessment, and treatment.[33] In a subgroup of Veterans with homeless experiences, there was a significant decrease in emergency department use after enrollment in integrated primary care (31% decrease in emergency department visits from the pre- to post-enrollment periods, $p < 0.001$).

Two single group studies reported emergency department utilization after enrollment in homeless-tailored primary care without data on utilization prior to enrollment. One single group study found that, on average, Veterans had 1 emergency department visit during the first 6 months of HPACT.[45] During this same period, 48% of the study population had an emergency department visit. Another single group study reported an average of 2.2 emergency department visits over 12 months for Veterans experiencing housing insecurity enrolled in homeless-tailored primary care.[38]

Appropriate Emergency Department Utilization

Three NRCSs and 1 single group studies reported a measure of appropriate emergency department use. One NRCS found a small but significant difference in ambulatory-care-sensitive condition emergency department visits from June 2012 to January 2014, with Veterans enrolled in HPACT having fewer visits compared to PACT (MD = -0.2, 95% CI [-0.3, -0.1], $p = 0.04$).[15] This same study reported fewer acute care visits, which included all-cause and ambulatory-care-sensitive emergency department visits and hospitalizations, for those in the HPACT group (aOR= 0.41, 95% CI [0.21, 0.80]).

One NRCS reported whether Veterans accessed the emergency department for non-emergency care, which was defined as "conditions that could have been treated in a primary care clinic."[36] The study found a lower odds of non-emergency emergency department utilization 7 to 12 months after enrollment in homeless-tailored primary care, but this was not significantly different from a historical group of similar Veterans in non-tailored general internal medicine (OR = 0.50, 95% CI [0.22, 1.13]).[36] However, when examining the distribution of emergency department visits (unit of observation emergency department visits), there were significantly fewer non-emergency emergency department visits in the homeless-tailored primary care group compared to the general internal medicine group during the last 6 months of the study period (OR = 0.46, 95% CI [0.22, 0.93]). There was also no difference in number of non-emergency emergency department visits per Veteran 7 to 12 months after enrollment in homeless-tailored primary care to Veterans in a general internal medicine groups (MD = -0.09, 95% CI [-0.27, 0.09]). The study also reported significantly lower odds of emergency department visits for non-acute conditions over 12 months in the homeless-tailored primary care group compared to Veterans enrolled in general internal medicine (aOR = 0.4, 95% CI [0.2, 0.80]).

One NRCS used the New York University algorithm to determine the appropriateness of emergency department visits.[14] The NRCS compared the proportion of emergency department and urgent care visits that were "appropriate" 6 months before and after enrollment in HPACT among Veterans experiencing housing insecurity.[14] The study also reported the change in the proportion of appropriate emergency department and urgent care visits from the first 6 months to the second 6 months of 2012 in 2 other groups. The first was Veterans experiencing housing insecurity in the same medical center but not enrolled in HPACT. The second comparison group was Veterans experiencing housing insecurity in medical centers that did not have HPACT. This study did not compare the change in the proportion of emergency department visits that were appropriate between groups. Significantly more emergency and urgent care visits were classified as not preventable/avoidable in the 6 months after HPACT enrollment compared to 6 months before enrollment (8.7% vs 10.0%, $p = 0.01$). There was a small but significant increase in not preventable or avoidable emergency department visits for Veterans experiencing housing insecurity at sites without HPACT (8.4% vs 9.1%, $p = 0.01$) but not in Veterans at sites where HPACT was available but who were not enrolled in HPACT (5.6% vs 5.8%, $p = 0.39$). More visits classified as non-emergent were found in the 6 months after HPACT enrollment compared to the 6 months prior to enrollment (22.3% vs 24.4%, $p = 0.004$). Slight increases in non-emergent visits were also observed for Veterans at medical centers with HPACT but not enrolled (24% vs 25.9%, $p < 0.001$) but not for Veterans at medical centers without HPACT (26.5% vs 26.5%, $p = 1.00$). There was a significant decrease in the number of unclassified emergency and urgent care visits before and after HPACT enrollment (51.1% vs 47.5%, $p < 0.001$) and for Veterans at medical centers with HPACT but not enrolled in HPACT (54.8% vs 51.6%, $p < 0.001$) and Veterans at medical centers with usual primary care (47.7% vs 46.3%, $p = 0.01$). There was no difference in the proportion of emergent/primary care treatable visits before and after enrollment in HPACT (12.9% vs 12.8%, $p = 0.92$). However, there was a small but significant increase from the first 6 months to the second 6 months of 2012 for Veterans at medical centers with HPACT but not enrolled in HPACT (12% vs 12.9%, $p = 0.002$) and in those who received usual care at non-HPACT sites (13.4% vs 14.1%, $p = 0.04$). There was no significant difference in any group for changes in emergency and urgent care visits that were preventable/avoidable.

The same NRCS conducted an analysis in a subgroup of high emergency department utilizers, which was defined as those with ≥2 emergency department visits in a 6-month period.[14] This study only reported within-group differences. There were no differences in visits that were categorized as not preventable or avoidable for Veterans before and after HPACT enrollment (9.0% vs 8.9%, $p = 0.91$) or

at HPACT sites for individuals not enrolled in HPACT when comparing the first and second 6 months of data in the 2012 calendar year (5.0% vs 5.5%, $p = 0.60$). However, there were significant increases in emergency department visits classified as not preventable or avoidable at non-HPACT sites when comparing the first and second 6 months of data in the 2012 calendar year (8.5% vs 9.5%, $p = 0.03$). Similarly, there was no significant difference in unclassified emergency department visits from before to after HPACT enrollment (51.7% vs 49.8%, $p = 0.13$) or at HPACT sites for individuals not enrolled in HPACT when comparing the first and second 6 months of data in the 2012 calendar year (59.6% vs 58.3%, $p = 0.46$). There was a significant increase in unclassified emergency department visits in usual care at non-HPACT sites when comparing the first and second 6 months of data in the 2012 calendar year (46.3% vs 44.2%, $p = 0.02$). There was a significant increase in non-emergency visits in the HPACT group (20.6% vs 24.4%, $p < 0.001$) but not for Veterans in the HPACT non-enrolled group (21.2% vs 21.6%, $p = 0.80$) or at medical centers without HPACT (26.8% vs 26.3%, $p = 0.48$). No differences were seen in any group for changes in emergency and urgent care visits that were preventable or avoidable or emergent but treatable in primary care.

Additionally, the same study reported changes in mean emergency and urgent care visits for patients based on emergency department utilization during the baseline period (the pre-enrollment period for the HPACT group and the first 6 months of study data for those non-enrolled or in usual care). There was a significant increase in emergency department visits after HPACT enrollment for Veterans with 0 emergency department visits before HPACT compared to Veterans at medical centers without HPACT (adjusted difference-in-differences = 0.44, $p < 0.05$). However, those enrolled in HPACT had a significant decrease in visits compared to those receiving usual care at non-PACT sites for those with 1 emergency department visit (adjusted difference-in-differences = -1.13, $p < 0.05$) or 2+ emergency department visits during the baseline period (adjusted difference-in-differences= -4.43, $p < 0.05$). Similar patterns were seen when comparing those enrolled in HPACT to those at HPACT sites who were not enrolled, with increases in those with 0 emergency department visits during the baseline period (adjusted difference-in-differences= 0.29 , $p < 0.05$), but significant decreases in those with 1 emergency department visit (adjusted difference-in-differences= -0.20, $p < 0.05$) and 2+ emergency department visits during the baseline period (adjusted difference-in-differences= -0.29, $p < 0.05$). Overall, there were significantly fewer mean emergency and urgent care visits per Veteran per month from before to after enrollment for those enrolled in HPACT (mean = 0.12 [NR)] vs 0.059 [NR], $p < 0.001$) but this change did not differ significantly when compared to changes in the HPACT non-enrolled group (difference-in-differences = -0.02 [-0.05, 0.02], $p = 0.27$) or those in usual care at sites without HPACT (difference-in-differences = -0.09 [-1.37, 1.19], $p = 0.89$).[14]

One single group study reported no difference in the mean number of inappropriate emergency department visits in the 12 months after compared to 12 months before HPACT enrollment (MD = -0.08, 95% CI [-0.32, 0.16]).[42]

Cause-Specific Emergency Department Utilization

Two NRCSs reported cause-specific emergency department use. One NRCS found no significant difference in the number of substance abuse-related emergency department visits per Veteran 7 to 12 months after enrollment in homeless-tailored primary care compared to similar a historical comparison of homeless Veterans who used non-tailored general internal medicine (MD = 0.32, 95% CI [-0.04, 0.68]).[36] Another NRCS reported significantly lower odds of having mental health-related emergency department visits from June 2012 to January 2014 for Veterans in HPACT compared to PACT (OR = 0.58, 95% CI [0.34, 0.98]).[15]

Inpatient Hospitalizations

Five studies (2 NRCSs and 3 single group) reported inpatient hospitalizations for Veterans experiencing housing insecurity enrolled in primary care. The studies did not consistently indicate the reason for hospitalization. One NRCS found no significant difference in the mean number of hospitalizations (unclear whether VA only or VA and community combined) or community hospitalizations from June 2012 to January 2014 between Veterans enrolled in HPACT compared to PACT (MD = -0.2, 95% CI [-0.5, 0.1] and MD = -0.1, 95% CI [-1.5, 1.3]).[15] This same study reported a significantly lower odds of having a hospitalization for Veterans in HPACT compared to PACT (OR = 0.55, 95% CI [0.31, 0.98]).

Another NRCS reported significantly more all-cause hospitalizations 7 to 12 months after enrollment in the homeless-tailored primary care group compared to the historic non-tailored general internal medicine group (MD = 0.32, 95% CI [0.04, 0.60], $p = 0.02$).[36] The study reported more hospitalizations over a 12 month period in the homeless-tailored primary care group compared to the general internal medicine group (72% vs 47%, $p = 0.02$). The study also found a significantly lower odds of being hospitalized for non-drug or non-alcohol use or mental health 7 to 12 months after enrollment in homeless-tailored primary care compared to similar Veterans in a historic general internal medicine group (OR = 0.15, 95% CI [0.04, 0.61]).[36]

One single group study reported a significantly lower odds of having an inpatient hospitalization 0 to 6 months and 7 to 12 months after HPACT enrollment compared to 6 months prior to enrollment (0 to 6 months aOR = 0.43, 95% CI [0.25, 0.76] and 7 to 12 months aOR = 0.45, 95% CI [0.26, 0.80]).[42] The same study also observed no differences in inpatient hospitalizations in the 12 months after compared to 12 months before HPACT enrollment in an unadjusted analysis (MD = -0.04, 95% CI [-0.35, 0.28]).

A subgroup analysis of Veterans with homeless experiences in integrated primary care found a 34% reduction in the rate of hospitalizations in the 4 quarters after compared to the 4 quarters before enrollment in integrated primary care ($p = 0.04$).[33]

A third single group study of Veterans enrolled in HPACT who received >90% of their care in the VA reported the adjusted mean number of Medicare acute hospitalizations and VA acute hospitalizations over 12 months (0.71, 95% CI [0.60, 0.82] and 0.55, 95% CI [0.39, 0.71]). This study did not report data on utilization prior to enrollment in HPACT. In a subanalysis, the adjusted mean number of Medicare acute hospitalizations over 12 months increased by the annual number of outpatient visits (0 to 22 outpatient visits annually = 0.21 hospitalizations, 95% CI [0.12, 0.31], 23 to 55 outpatient visits annually = 0.64 hospitalizations, 95% CI [0.51, 0.78] and >55 visits outpatient visits = 1.31 hospitalizations, 95% CI [1.04, 1.58]). Similarly, the adjusted mean number of VA acute hospitalization increased by intensity (0 to 22 outpatient visits = 0.27 hospitalizations , 95% CI [0.11, 0.43]; 23 to 55 outpatient visits = 0.50, 95% CI [0.26, 0.73]; >55 outpatient visits = 1.17 hospitalizations, 95% CI [(0.70, 1.63]).[46] The study also reported the total VA- and Medicare-financed acute care hospitalizations (adjusted mean = 1.49, 95% CI [1.26, 1.71]), VA-financed acute care hospitalizations (adjusted mean = 0.63, 95% CI [0.48, 0.78]), and Medicare-financed acute care hospitalizations (adjusted mean= 0.85, 95% CI [0.72, 0.98]) over the 12-month period.

Specialty/Other Care Utilization

Specialty Care (General)

Five studies (2 NRCSs and 3 single group) reported specialty care utilization without specifying the specialties.[14,15,38,42,45] One NRCS compared the change in specialty care utilization 6 months before and after enrollment in HPACT among Veterans experiencing housing insecurity with 2 or more emergency department visits during the baseline period. The study also compared this change to the change in specialty care from the first 6 months to the second 6 months of 2012 in 2 other groups. The first was Veterans experiencing housing insecurity in the same medical center but not enrolled in HPACT. The second comparison group was Veterans experiencing housing insecurity in medical centers that did not have HPACT.

There was no significant change in the number of medical specialty visits per month before and after HPACT enrollment (MD = -0.007, 95% CI [-0.019, 0.005], $p = 0.24$). Nor was there a significant difference in change in specialty visits per month between Veterans in HPACT and similar Veterans receiving primary care at medical centers without HPACT (difference-in-differences = -0.016, $p = 0.42$). However, there was a significant difference in the change in specialty care visits between Veterans at medical centers with HPACT but not enrolled in HPACT and Veterans enrolled in HPACT (difference-in-differences = 0.002, $p = 0.0022$).[14]

One NRCS reported no significant difference in the mean number of specialty care visits over 2 years for Veterans enrolled in HPACT compared to PACT (MD = -0.5, 95% CI [-1.8, 0.8], $p = 0.41$).[15]

One single group study found significantly more medical specialist visits 12-months after compared to 12-months before HPACT enrollment (MD = 1.44, 95% CI [0.31, 2.56], $p = 0.012$).[42]

One single group study reported 12-month specialty care utilization for Veterans in homeless-tailored primary care (mean = 2.6 [SD 4.0]).[38] This study did not report data on utilization prior to enrollment in homeless specialized primary care.

One single group study without baseline utilization data reported that 86.6% of Veterans in HPACT used specialty care during the first 6 months of primary care enrollment.[45]

Mental Health

Seven studies (3 NRCSs and 4 single group) reported mental health care utilization.[14,15,33,38,40,42,45] One NRCS compared the change in mental health visits among Veterans experiencing housing insecurity with 2 or more emergency department visits during the baseline period. This study compared the change in visits 6 months before and after enrollment in HPACT to the change in mental health visits during the first 6 months of 2012 compared to the second 6 months of 2012 for Veterans experiencing housing insecurity in the same medical center but not enrolled in HPACT and Veterans experiencing housing insecurity in medical centers that did not have HPACT.[14] The NRCS reported a significant reduction in the number of mental health care visits in 6 months after compared to the 6 months before HPACT enrollment (MD = -0.04, $p = 0.0031$). This change was not significantly different than the change in the number of mental health care visits for Veterans in HPACT sites but not enrolled in HPACT from the first 6 months to the second 6 months of 2012 (difference-in-differences = 0, $p = 0.22$), or the change for Veterans in medical centers without HPACT (difference-in-differences = -0.066, $p = 0.88$).

One NRCS reported significantly fewer mental health care visits over 2 years for Veterans enrolled in HPACT compared to PACT (MD = -4.6, 95% CI [-7.9, -1.3], $p = 0.01$).[15] Additionally, there was a significantly lower odds of accessing group therapy over 2 years for Veterans in the HPACT compared to PACT (OR = 0.59, 95% CI [0.35, 0.99]). There was no significant difference in the odds of Veterans accessing psychiatry or psychology care between Veterans in HPACT and PACT (OR = 0.75, 95% CI [0.44, 1.28] and OR = 0.76, 95% CI [0.44, 1.30]).

Another NRCS found significantly greater odds of receiving treatment for depression within 84 and 180 days following a positive Patient Health Questionnaire (PHQ-2) screen between those in HPACT compared to PACT (aOR = 1.61, 95% CI [1.21, 2.15] and aOR = 1.51, 95% CI [1.15, 1.99]).[40] The NRCS also found Veterans in HPACT compared to PACT had significantly greater odds for a composite measure of receiving ≥60 day supply of antidepressant prescriptions, ≥4 mental health specialist visits, or ≥3 psychotherapy visits for Veterans in HPACT compared to PACT(aOR = 1.58, 95% CI [1.15, 2.16]).

One single group study found no significant differences in the mean number of mental health encounters in the 12 months after compared to the 12 months before HPACT enrollment (MD = 0.14, 95% CI [-0.98, 1.25], $p = 0.805$).[42] This study also found no significant difference in the odds of a mental health visit 0 to 6 months after HPACT enrollment compared to 6 months before enrollment (aOR= 0.90, 95% CI [0.53, 1.51]). However, there were significantly lower odds of mental health specialist visits 7 to 12 months after HPACT enrollment compared to 6 months before enrollment (aOR = 0.35, 95% CI [0.20, 0.60]).

Another single group study reported a non-significant reduction in mental health clinic utilization in the 4 quarters after compared to the 4 quarters before enrollment in integrated primary care (-30%, $p = 0.10$).[33]

Two single group studies did not report data on utilization prior to enrollment in homeless-oriented primary care. A single group study reported the 12-month average number of mental health care encounters for Veterans in homeless specialized primary care (mean = 34.9 [SD 39.1]).[38] This study also reported that 2.8% of Veterans in homeless-specialized primary care received intensive mental health case management over 12 months. Another single group study found that 88.2% of Veterans had a mental health care visit during the first 6 months of HPACT enrollment.[45]

Substance Use

One NRCS and 3 single group studies reported treatment of substance use for Veterans enrolled in homeless-tailored primary care. One NRCS reported no significant change in substance abuse visits from before to after HPACT enrollment (MD = -0.05, $p = 0.72$) among Veterans experiencing housing insecurity with 2 or more emergency department visits during the baseline period. This change was not significantly different than the change in substance abuse visits over a similar period for Veterans experiencing housing insecurity at the same medical center not enrolled in HPACT (difference-in-differences = 0, $p = 0.47$) or Veterans in medical centers without HPACT (difference-in-differences = -0.068, $p = 0.14$).[14]

One single group study reported no significant differences in the number of addiction specialist visits in the 12 months after HPACT enrollment compared to the 12 months before (MD = -0.07, 95% CI [-0.22, 0.08], $p = 0.35$). Nor were there significant differences in the odds of an addiction specialist visit 0 to 6 months after HPACT enrollment compared to 0 to 6 months prior (aOR = 0.51, 95% CI

[0.24, 1.06]). However, there were significantly lower odds of an addiction specialist visit 7 to 12 months after HPACT enrollment compared to the 6 months before enrollment (aOR = 0.39, 95% CI [0.18, 0.84]).[42]

Another single group study reported a significant reduction in specialty substance disorder clinic visits from the 4 quarters before and after enrollment in integrated primary care (-40%, $p < 0.001$).[33]

A single group study without baseline utilization data reported that 37.8% of Veterans utilized substance abuse treatment services during the first 6 months of HPACT enrollment.[45]

Other Specialty Care

One NRCS compared the change in specialty care among Veterans experiencing housing insecurity with 2 or more emergency department visits during the baseline period. This study compared visits 6 months before and after enrollment in HPACT to the change in primary care visits during the first 6 months of 2012 compared to the second 6 months of 2012 for Veterans experiencing housing insecurity in the same medical center but not enrolled in HPACT and Veterans experiencing housing insecurity in medical centers that did not have HPACT. This study reported small but significant reductions in the mean number of monthly visits for laboratory and imaging (MD = -0.05, $p = 0.039$), rehabilitation (MD = -0.014, $p = 0.0068$), social work (MD = -0.012, $p = 0.008$), and surgery (MD = -0.0032, $p = 0.019$) in the 6 months after HPACT enrollment compared to the 6 months before enrollment.[14] There was no significant difference in social work visits for Veterans in HPACT compared to similar Veterans at medical centers with HPACT but not enrolled in HPACT, or Veterans in medical centers without HPACT. There was a small increase in homeless care visits from before to after enrollment in HPACT (MD = 0.02, $p < 0.001$). This change was significantly different from the change for Veterans at medical centers with HPACT but not enrolled in HPACT (difference-in-differences = 0.03, $p < 0.001$) and Veterans at medical centers without HPACT (difference-in-differences = -0.004, $p < 0.001$).[14] There was a significant difference in rehabilitation and diagnostic (laboratory and imaging) visits for Veterans in enrolled in HPACT compared to similar Veterans at medical centers with HPACT but not enrolled in HPACT, but the direction of this relationship was unclear based on the reported data. There was no significant difference in rehabilitation visits and diagnostic (laboratory and imaging) visits for Veterans enrolled in HPACT compared to similar Veterans at medical centers without HPACT.

The same study reported no change in dental visits before to after enrollment in HPACT (MD = 0.001, $p = 0.97$), but this change was significantly different from the change in Veterans at sites with HPACT who were not enrolled ($p = 0.0059$). There was no significant difference in change in dental visits for Veterans in the HPACT group compared to similar Veterans in medical centers without HPACT ($p = 0.056$). There was no change in surgical specialty visits before to after enrollment in HPACT (MD = -0.009, $p = 0.76$), nor were there significant differences in change when compared to Veterans at medical centers with HPACT but not enrolled or Veterans at medical centers without HPACT.[14]

One NRCS reported significantly more social work visits over a 2-year period for Veterans enrolled in HPACT compared to PACT (MD = 1.9, 95% CI [1.0, 2.8], $p = 0.001$). The same study found a large difference in 30-day prescription drug fills, with Veterans enrolled in HPACT having significantly fewer drug fills compared to PACT (MD = -18.3, 95% CI [-29.9, -6.7], $p = 0.001$).[15]

One single group study without data on utilization prior to enrollment in homeless specialized primary care reported the 12-month average number of encounters for other care (15.4, SD [18.9]).[38] This study

also found that 4.5% of Veterans received telehealth services and 1.7% received palliative care or hospice services.

Cost and Return on Investment

One NRCS found significantly lower total VA annual cost for Veterans enrolled in HPACT compared to similar Veterans in PACT (MD = -$9,352, 95% CI [-$17,281, -$1,422]).[15] The study analyzed Veterans between 2012 to 2014, and it was unclear whether dollars were indexed to a common year. The same study reported lower mental health-related substance abuse treatment costs and slightly higher primary care costs for those in HPACT compared to similar Veterans in PACT (MD = -$1,392, 95% CI [-$2,658, -$125] and MD = $681, 95% CI [$45, $1,316]). The study reported no significant difference in costs for specialty care, emergency department care, emergency department care for ambulatory care-sensitive conditions, VA sponsored community-based care, hospitalizations, or prescription drugs between groups.

No study reported return on investment or cost-effectiveness.

Satisfaction

Seven studies (6 NRCSs and 1 single group) reported on Veteran satisfaction. Five NRCSs compared HPACT to PACT and 1 NRCS compared homeless-tailored care to mainstream care. One NRCS used the Primary Care Quality-Homeless (PCQ-H) questionnaire and found a greater odds of reporting favorable outcomes on multiple domains for Veterans in HPACT compared to PACT: accessibility and coordination (aOR = 2.2, 95% CI [1.6, 3.1]), patient-clinician relationship (aOR = 1.9, 95% CI [1.4, 2.6]), perceived cooperation among clinician (aOR = 1.9, 95% CI [1.4, 2.6]), and homeless-specific needs (aOR = 2.1, 95% CI [1.5, 2.9]).[39]

Two NRCSs by the same researchers used the 2014–2015 PCMH-SHEP. One of these NRCSs found significantly higher positive experiences for Veterans at medical centers with HPACT compared to medical centers without HPACT for outcomes related to access (adjusted % = 45.5 vs 42.2, p = NR), communication (adjusted % = 65.8 vs 58.9, p = NR), office staff helpfulness/courtesy (adjusted % = 60.0 vs 58.8, p = NR), overall provider rating (adjusted % = 53.7 vs 48.0, p = NR), comprehensiveness (adjusted % = 48.4 vs 44.0, p = NR), care coordination (adjusted % = 59.9 vs 55.6, p = NR), shared decision-making (adjusted % = 42.3 vs 37.9, p = NR), and self-management (adjusted % = 52.6 vs 45.0, p = NR).[41] The other NRCS by these researchers found significantly higher positive experiences relating to access (aRD = 21.1, 95% CI [11.2, 31.0]), communication (aRD = 13.1, 95% CI [4.5, 21.7]), office staff helpfulness/courtesy (aRD = 12.3, 95% CI [3.5, 21.0]), and provider rating (aRD = 11.9, 95% CI [2.4, 21.4]) for Veterans enrolled in HPACT compared to similar Veterans at HPACT facilities who were not enrolled.[32] There was no significant difference in measures of comprehensiveness, coordination, self-management support, or shared decision-making between groups. The same study found slightly higher positive experiences relating to communication (aRD = 4.7, 95% CI [0.9, 8.4]) and self-management support (aRD = 4.6, 95% CI [0.7, 8.5]) for Veterans receiving primary care at HPACT facilities who were not enrolled in HPACT compared to Veterans receiving care at facilities without HPACT. There were no other significant differences between these groups.

One NRCS used PCQ-H to assess experiences of Veterans experiencing housing insecurity enrolled in HPACT to similar Veterans in PACT.[43] Veterans in HPACT compared to PACT had significantly lower unfavorable experience (indicating positive responses) weighted and adjusted scores (and

predicted percentages) for all domains, which included relationship, cooperation, access/coordination, and homeless-specific needs ($p < 0.001$ for all).

Another NRCS reported no significant differences in scores for domains of relationship (MD = -0.13, 95% CI [-0.44, 0.18]), cooperation (MD = -0.10, 95% CI [-0.46, 0.26]), access/coordination (MD = -0.04, 95% CI [-0.34, 0.26]), or homeless-specific needs (MD = -0.19, 95% CI [-0.45, 0.07]) for Veterans in homeless-tailored primary care compared to Veterans in usual primary care.[44]

One NRCS assessed multiple domains of satisfaction using a Likert scale (score 1-5, with 1 being strongly agree) for Veterans experiencing housing insecurity in HPACT and PACT.[15] The NRCS found no significant difference in domains relating to staff, care, contextual factors (such as cost and wait times), and perceived treatment between Veterans enrolled in HPACT and similar Veterans in PACT.

One single group study used the 2013 PCMH-SHEP to report experiences of care for Veterans experiencing housing insecurity enrolled in primary care.[31] This study found that more Veterans experiencing housing insecurity reported positive versus negative experiences with access (22.7% vs 16.0%, p = NR), communication (56.8% vs 13.0%, p = NR), office staff helpfulness/courtesy (55.0% vs 10.1%, p = NR), overall provider rating (45.6% vs 10.4%, p = NR), comprehensiveness (53.1% vs 18.8%, p = NR), care coordination (53.3% vs 12.6%, p = NR), mediation decision-making (41.3% vs 12.1%, p = NR), and self-management support (45.7% vs 31.4%, p = NR). Of note, the survey response options also included a moderate option (data omitted), and the study did not report data on experiences prior to enrollment in primary care.

Housing, Community Integration, and Food Insecurity

One single group study reported that 53.3% of Veterans receiving homeless-specialized primary care also received housing services.[38]

No study reported data on food insecurity.

Disease-Specific Outcomes

One NRCS reported no significant differences in any overdose outcomes (aOR = 1.09, 95% CI [0.92, 1.28]), drug-related overdose outcomes (aOR = 1.12, 95% CI [0.91, 1.38]), or alcohol-related overdose outcomes (aOR = 1.21, 95% CI [0.96, 1.53]) over 3 years for Veterans enrolled in HPACT compared to usual primary care.[47]

A second NRCS observed that significantly more Veterans achieved their target goal for lipid management in the homeless-oriented primary care group compared to non-tailored general internal medicine group (65.4% vs 45.5%, $p < 0.01$). However, the calculated odds ratio was not statistically significant (OR = 2.27, 95% CI [0.83, 6.18]). Finally, there were no significant differences in the odds of Veterans being at their target goal for overall blood pressure (OR = 1.24, 95% CI [0.41, 3.72]) or diabetes care (OR = 1.14, 95% CI [0.18, 7.28]).[36]

DISCUSSION

Establishing and engaging Veterans experiencing housing insecurity with primary care provides an opportunity to manage the complex medical and social needs of these Veterans. The present review synthesized available evidence on the benefits of primary care and homeless-tailored primary care for Veterans experiencing housing insecurity across a range of health care utilization and disease outcomes. We identified 4 studies that examined the effect of receiving primary care compared with not receiving primary care and 16 studies that compared homeless-tailored primary care to usual primary care. All the studies enrolled Veterans experiencing housing insecurity, but only 1 study analyzed Veterans exclusively from a named homeless program (HUD-VASH). The most frequently evaluated outcomes were emergency department use, satisfaction, inpatient, and special care use. Key findings include:

Effect of Engaging Veterans Experiencing Housing Insecurity in Primary Care

- Engaging Veterans experiencing housing insecurity in any primary care may significantly reduce hospitalizations and emergency department visits (moderate confidence).
- Among Veterans experiencing housing insecurity, primary care visits may be high after initial engagement in primary care and then decrease over time (low confidence).
- Studies provided insufficient evidence (no conclusion) for housing or community integration outcomes for housing-insecure Veterans who are versus are not established in primary care.
- The studies did not evaluate specialty care utilization, cost and return on investment, Veteran experience or satisfaction, or disease-specific outcomes.

Effect of Homeless-Tailored Primary Care versus Usual Primary Care

- Homeless-tailored primary care may reduce inpatient hospitalizations and emergency department visits and increase appropriate use of emergency care (low confidence).
- Studies provided insufficient evidence (no conclusion) on the effect of homeless-tailored compared to usual primary care on primary care utilization or overall specialty care utilization.
- Homeless-tailored primary care may reduce mental health and substance use visits (low confidence).
- Patient experiences may be better for housing-insecure Veterans in homeless-tailored primary care compared to usual primary care (low confidence).
- Homeless-tailored primary care may increase primary care costs and reduce emergency department and overall health care costs (low confidence).
- There is no evidence for a difference in disease-specific outcomes for Veterans in homeless-tailored primary care compared to usual care (low confidence).
- The studies did not evaluate housing and community integration outcomes.

Only 4 studies evaluated the effect (or association) of primary care (*ie,* yes or no primary care) on outcomes for Veterans experiencing housing insecurity. Two of the 4 studies included Veterans who were previously not established with primary care and 2 studies compared Veterans who did or did not

use primary care. Importantly, 2 of these studies were not originally designed to investigate the effect of primary care on outcomes. The studies identified fewer emergency department visits, as well as fewer inpatient admissions for Veterans experiencing housing insecurity engaged in primary care compared to those without primary care engagement. This finding is consistent with the broader literature that has concluded that increased access to primary care is generally associated with less use of acute care.[48, 49] Establishing and engaging Veterans in primary care likely prevents some acute events through better chronic disease management and diverting patients with low health needs that can be treated in primary care rather than the emergency deparment.[48, 50] Although the 4 studies did not evaluate cost, the findings of reduced acute care may translate into cost savings and a positive return on investment for engaging Veterans experiencing housing insecurity in primary care. One study found that for Veterans newly established in primary care, primary care use was initially high and then decreased over time. Although the study did not provide an explanation for this result, this finding may point to a high number of unmet health care needs in the population. These needs may be addressed during the initial primary care visits and then stabilize over time. Furthermore, studies provided insufficient evidence to determine the effect of engaging in primary care on housing or community integration outcomes, and no studies examined the effect of primary care on specialty care use or chronic disease management for Veterans experiencing housing insecurity.

More studies compared homeless-tailored primary care (either HPACT or a model of homeless-tailored primary care) to general or usual primary care. Studies likely focused on this comparison because VA providers (at the national and medical center levels) have implemented multiple models of homeless-tailored primary care, which can be compared to usual primary care. Models of homeless-tailored primary care have been labeled differently in the literature, but generally consist of high staff-to-patient ratios, traditional primary care services, non-medical social services, and outreach.[51] Homeless-tailored primary care may reduce inpatient hospitalizations and emergency department visits and increase appropriate use of emergency care. Of note, the studies did not consistently report whether hospitalizations or emergency department visits were for a specific cause or represented all-cause utilization. The reductions in acute care occurred despite insufficient evidence for primary care utilization or overall specialty care utilization for Veterans in homeless-tailored primary care compared to usual primary care. One study found that primary care costs were higher for those in HPACT compared to PACT, but emergency department and overall costs were lower. Again, studies were not designed nor reported data to fully understand the mechanism through which homeless-tailored primary care affects outcomes. Importantly, Veterans in homeless-tailored primary care had higher experience or satisfaction scores indicating that they rated the added services or attitudes typically provided with tailored care higher than usual care. Studies of the general population have demonstrated that satisfaction with health care is important and associated with better patient outcomes.[52] We concluded that tailored primary care may reduce mental health and substance use services. This may be because homeless-tailored primary care includes these services as part of their model of care. However, an alternative explanation is that Veterans in HPACT may not receive the same referrals for services as non-HPACT Veterans.

STRENGTHS AND LIMITATIONS OF THE EVIDENCE BASE

The overall evidence base has important methodological limitations. First, the studies varied considerably in design and aims, precluding simple summarization across studies or meta-analysis. Second, the studies used different terms to define the population of Veterans experiencing housing insecurity. Some studies labeled the population as homeless, while others used terms such as patients with homeless experiences, homeless-experienced, and people who have experienced homelessness.

Sometimes when the term "homeless" was used, it was unclear whether this meant homelessness at the time of inclusion into the study or a history of (prior) homelessness. Moving forward, there should be an eye towards consistent language to describe the population of "homeless" Veterans.

Third, the studies varied in their method of identifying relevant Veterans, with most studies using a combination of ICD codes and VA homeless service use or enrollment in HPACT or specialized primary care. In some cases, simply relying on ICD codes and homeless service use may not provide a full count of Veterans experiencing housing insecurity.[53] Moreover, the studies used different lookback periods when defining their inclusion criteria. Longer lookback periods will include more Veterans with a history of homelessness, but comparing someone who was homeless 3 years ago versus within the last year may not be comparable. Using program enrollment data is a strong approach but, in some cases, can still leave challenges with identifying a comparable comparison group.

Fourth, studies did not examine whether the benefits of primary care were consistent across important subpopulations of Veterans, many of which are disproportionately impacted by homelessness. Individuals experiencing homelessness may already face barriers to accessing appropriate health care, and those who are racial or ethnic minorities may encounter additional cultural or systemic barriers to appropriate health care utilization.[54] In addition, female Veterans may be more likely to experience housing insecurity and have more health and social unmet needs.[3, 4] Furthermore, the intersectionality between race and gender (and sexual and gender identity) may have important implications for these subpopulations. Subgroup analyses by race and ethnicity, gender, sexual identity, and other sociodemographic factors could provide a better understanding of how primary care access or tailored primary care use may differentially affect these groups.

Fifth, although of importance to operational partners, studies were inconsistent in whether they reported cost, return on investment, disease-specific outcomes, and housing outcomes.

Lastly, the evidence on the effect of establishing Veterans experiencing housing insecurity in primary care has additional unique challenges. It is typically not practical, and may not be ethical, to randomize Veterans to receive or not receive primary care. Thus, investigators must rely on observational data (mostly VA electronic medical records) to compare Veterans who do and do not engage in care. Even when controlling for confounders with robust VA data, the potential for selection bias is still likely to be high when investigating primary care as an exposure. Factors such as degree of treatment readiness and treatment engagement, history of stigmatization, contributing impacts of other social drivers of health, and co-occurring conditions can impact Veterans' engagement in primary care. Because of this, it may be challenging to draw conclusion from the current evidence without the need for several caveats to these results. Importantly, 2 of the 4 studies examining the effect of primary care exposure were designed to investigate a different question but reported sufficient data to allow us to extract relevant data for the purposes of this review.[34, 35]

Challenges for addressing selection bias persist for studies evaluating the effect of homeless-tailored primary care versus usual primary care. In multiple studies, there were concerns related to the representativeness of the comparator group or the use of crude unadjusted analyses. To address selection bias, some studies made use of natural variation in time and/or location of implementation of homeless-tailored primary care. For example, 1 study compared Veterans in homeless-tailored primary care to a historical comparison group,[36] and 4 studies compared Veterans in medical centers that did or did not offer HPACT.[14,32,36,41] However, in these studies there were still challenges with finding a comparable exposure time for the comparison group.

IMPLICATIONS FOR VA POLICY AND PRACTICE

There is a VHA priority to support Veterans' whole health. For Veterans experiencing housing insecurity, this includes primary care, housing, and treatment of medical and mental health conditions. We found that establishing and engaging Veterans experiencing housing insecurity in primary care was associated with lower emergency department use, including inappropriate emergency department use and fewer hospitalizations. In addition, Veterans enrolled in a homeless-tailored primary care felt more "satisfied" or had more positive experiences with their care. Because of the reduction in emergency and inpatient visits and efficient use of outpatient care, there is clear value in establishing Veterans experiencing housing insecurity in primary care. Although homeless-tailored primary care has some additional benefits over usual primary care, it is commonly accepted that any primary care is better than none.

Engaging and retaining Veterans experiencing housing insecurity in VA care is important because this population has housing, social, and medical needs that may be difficult to address outside the VA in a community setting. In comparison, the VA is uniquely able to provide these Veterans with comprehensive supports to address housing, social, and medical needs. The VA is positioned to enroll Veterans experiencing housing insecurity in primary care. The multiple VA programs to end Veteran homelessness typically have formal intake assessments, enrollments in programming, and multiple contacts with staff. During intake or other contacts with homeless program staff, there is an opportunity to refer Veterans to primary care. VA decision-makers should consider developing a formal protocol that facilitates referrals between homeless program staff and primary care staff. Any formal protocol should be evaluated using rigorous implementation science methods. Evaluating efforts to strengthen connections between programs may require adding additional questions or items to homeless program intake assessments, but adding items to program intake will need to be balanced against staff time and burden.

STRENGTHS AND LIMITATIONS OF THE SYSTEMATIC REVIEW PROCESS

Our review represents the most up-to-date report evaluating the effect of establishing Veterans experiencing housing insecurity in primary care and the effect of tailored primary care compared to usual primary care. We used a custom search and uniform screening protocol to identify studies relevant to the key questions of this review, and the review team included individuals with both methodological and topic expertise. We did not differentiate between different tailored primary care programs and instead evaluated them as a single group. In addition, we did not differentiate between the types of usual primary care, which consisted of programs described as PACT and general internal medicine primary care. Care provided across these programs (both intervention and usual care) may be different, making it challenging to understand what aspects of tailored primary care affect outcomes. Further, because many of these studies utilized the same VA data (medical centers with HPACT) or national Veteran surveys, the same Veterans may be included in more than one of the identified studies. Lastly, many studies were not designed to directly investigate the effect of primary care. As a result, it was necessary to exclude information from some comparison groups (such as from studies that compared Veterans experiencing housing insecurity to stably housed Veterans) and to evaluate some NRCSs as single group studies. Related, we may have missed some studies where the effect of primary care for Veterans experiencing housing insecurity was not the aim of the study and instead the study only used primary care as a covariate in a regression model.

FUTURE RESEARCH

The evidence base regarding the effect of establishing Veterans experiencing housing insecurity in primary care is small. Although it is not practical or ethical to randomize Veterans to primary care, there are opportunities for qualitative research to understand barriers and facilitators to accessing care and the perceived benefits of primary care.

Investigating homeless-tailored primary care compared to usual primary care may be an ideal scenario for site-level randomization (*ie,* randomized at the Medical Center level),[55, 56] such as that used in VA's Partnered Evidence-Based Policy Resource Center random program evaluation model. Cluster or site-level randomized trials may allow for higher quality studies while reducing the ethical considerations surrounding randomizing Veterans to homeless-tailored primary care or usual primary care. Future studies evaluating homeless-tailored primary care should also focus on describing the specific features of the tailored primary care model and understanding the aspects of tailored primary care that create value. For example, Multiphase Optimization Strategy (MOST) framework is one approach to understand the different features of homeless-tailored primary care that are most effective. Further, there was limited information for several outcomes of interest, including data on costs and disease-specific outcomes. Additional cost and cost-effectiveness data would be particularly powerful to help understand the resources required to deliver homeless-tailored primary care. For studies conducted in the VA, cost data may be relatively easy to evaluate (obtained from routinely captured VA data) and would not increase participant burden with surveys.

Additionally, there have also been several adaptations to HPACT, including the use of Mobile Medical Units, which may increase access to care for underserved communities.[57] Future studies should explore the impact of these HPACT adaptations. There is also a need for future studies to consider the contextual factors that influence care, such as neighborhood factors and transportation access.[58] Identified studies were too dissimilar to permit meta-analyses. While future studies should build on existing evidence, they should also be designed to be comparable to each other. VA researchers and staff should consider prospectively planning studies together or develop consensus about the best study designs to use and most actionable outcomes to assess.

CONCLUSIONS

Findings from this review highlight the potential value of establishing and engaging Veterans experiencing housing insecurity in primary care and more specifically homeless-tailored primary care. Benefits of primary care for Veterans experiencing housing insecurity include reducing hospitalizations and emergency department visits. Although these studies did not evaluate cost, the reductions in acute care may translate to cost savings and a return on investment. In addition, homeless-tailored primary care may provide some additional benefits over usual primary care for Veterans experiencing housing insecurity, including reduced inpatient hospitalizations and emergency department visits and increased appropriate use of emergency care, overall cost savings, and better experiences with care. Homeless-tailored primary care may reduce the use of mental health and substance treatment, but this could be because homeless-tailored primary care includes these services in its model of care or because referral practices differ for Veterans who are versus are not enrolled in HPACT. Additional data are needed on the effect of engagement in primary care on disease and community integration outcomes, and on cost and return on investment of homeless-tailored primary care. Future studies should also aim to understand the specific features of homeless-tailored primary care and how they affect outcomes.

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