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RESEARCH ARTICLE

Unmet mental health and substance use treatment needs among older homeless adults: Results from the HOPE HOME Study

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Abstract

Aims: To examine the prevalence of and factors associated with unmet need for mental health and substance use treatment in older homeless adults.

Methods: Among 350 homeless adults aged ≥ 50 , we examined prevalence of mental health and substance use problems and treatment. Using logistic regression, we examined factors associated with unmet treatment need.

Results: Among those with a mental health problem, being aged ≥ 65 was associated with an increased odds, while having a regular healthcare provider and case manager were associated with a decreased odds of having unmet need for mental health treatment. A first homelessness episode at age ≥ 50 was associated with increased, while spending time in jail/prison or having a case manager was associated with decreased odds of unmet needs for substance use treatment.

Conclusion: Older homeless adults have a high prevalence of unmet behavioral health treatment need. There is a need for targeted services for this population.

KEYWORDS

aging, depressive symptoms, homelessness, mental health, outpatient care, substance abuse, suicidal ideation

1 | INTRODUCTION

The homeless population is aging (Culhane, Metraux, Byrne, Stino, & Bainbridge, 2013). People born in the second half of the “baby-boom” have an elevated risk of homelessness (Culhane et al., 2013). Homeless adults develop aging-related conditions, including functional impairment, earlier than individuals in the general population. For this reason, homeless adults aged 50 and older are considered “older” despite their relatively young age (Brown, Kiely, Bharel, & Mitchell, 2012; Cohen, 1999; Gelberg, Linn, & Mayer-Oakes, 1990).

The homeless population has a higher prevalence of mental health and substance use problems than the general population (Fazel, Khosla, Doll, & Geddes, 2008; Kessler et al., 2010; Lapp, Agbokou, & Ferreri, 2011; Spinelli et al., 2017; Walker, Cummings, Hockenberry, & Druss, 2015). Individuals experiencing homelessness report barriers to mental health services, due to lack of insurance coverage, high cost of care, and inability to identify sources of care (Baggett, O’connell, Singer, & Rigotti, 2010; Lebrun-Harris et al., 2013; Zur & Jones, 2014). These barriers can prevent their using services to treat mental health and substance use problems, such as outpatient counseling, prescription medication, and community-based substance use treatment. Without these, homeless populations may experience more severe behavioral health problems and rely on acute care to address these chronic conditions. Homeless individuals have higher rates of Emergency Department (ED) use for mental health and substance use concerns (Bharel et al., 2013), and are more likely to use psychiatric inpatient or ED services and less likely to use outpatient treatment than those who are housed (Folsom et al., 2005).

Homeless adults with substance use disorders face multiple barriers to engaging in substance use treatment. Competing needs (i.e., finding shelter, food, or other necessities), financial concerns, lack of knowledge about or connection to available services, and lack of insurance are barriers to substance use treatment among homeless adults (Koegel, Sullivan, Burnam, Morton, & Wenzel, 1999; Krausz et al., 2013; O’Toole, Pollini, Ford, & Bigelow, 2008; Wenzel et al., 2001; Zur & Jones, 2014). Older adults face additional barriers to mental health or substance use treatment due to cognitive and functional impairment, such as difficulty navigating and traveling to healthcare systems (Kuerbis, Sacco, Blazer, & Moore, 2014; Wuthrich & Frei, 2015). However, there is little known about older adults experiencing homelessness.

According to Gelberg and Anderson’s Behavioral Model for Vulnerable Populations, predisposing factors, enabling factors, and need, shape health care utilization (Gelberg, Andersen, & Leake, 2000). Although prior research has used this model for homeless populations, this work has not included older homeless adults (Stein, Andersen, & Gelberg, 2007). Little is known about the prevalence of mental health or substance use problems in older homeless adults, the level of unmet need for services, or the factors associated with that need. To understand the factors associated with unmet need for mental health and substance use treatment in older homeless adults, in a population-based sample of homeless adults age 50 and older, we identified those with a need for mental health and substance use services. Then, we applied the Gelberg and Anderson model to examine predisposing and enabling factors associated with unmet need, which we defined as not receiving mental health and substance use treatment among participants with mental health or substance use problems (Gelberg et al., 2000).

2 | METHODS

2.1 | Study overview

The Health Outcomes of People Experiencing Homelessness in Older Middle Age (HOPE HOME) Study is a longitudinal study of physical and mental health, life course events, and functional status among older homeless adults. The University of California, San Francisco Institutional Review Board approved all study activities.

2.2 | Sample and recruitment

From July 2013 to June 2014, we used population-based sampling to recruit 350 homeless individuals age 50 and older in Oakland, California (Burnam & Koegel, 1988; Lee, Ponath, Tieu, Riley, & Kushel, 2016) (Figure 1). We recruited participants from all overnight homeless shelters serving single adults over age 25 ($n = 5$), all low-cost meal programs serving at least three meals per week ($n = 5$), one recycling center, and places where unsheltered homeless individuals stayed. We constructed our sampling frame to approximate the source population; we randomly selected potential participants at each recruitment site (Henry, Watt, Rosenthal, & Shivji, 2017; Lee et al., 2016).

Eligibility criteria included the ability to communicate in English, age 50 or older, currently homeless as defined in the Homeless Emergency Assistance and Rapid Transition to Housing Act of (2009, 2009), and ability to give written informed consent as determined using a teach-back method (Dunn & Jeste, 2001). After informed consent, study staff conducted an in-depth structured baseline interview. They entered responses into electronic data capture software. Individuals received a \$25 gift card to a major retailer for completing the eligibility screen and baseline interview.

2.3 | Measures

2.3.1 | Predisposing factors

Predisposing factors are demographic, social-structural, and attitudinal-belief factors that make it more likely that individuals will use health services. (Andersen, 2008; Andersen & Newman, 1973; Gelberg et al., 2000). We included demographic, educational, housing, involvement with the criminal justice system, and physical health factors as predisposing factors.

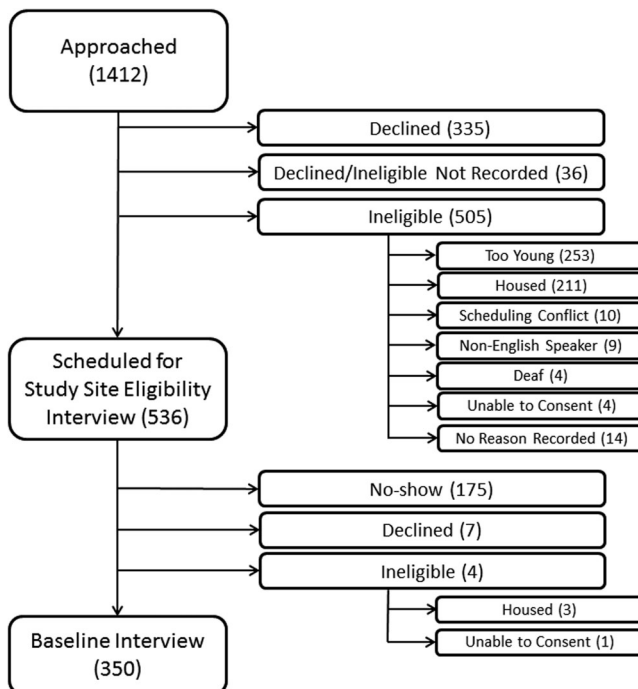


FIGURE 1 Recruitment flow chart. The figure shows the number of individuals enrolled at baseline

Demographics

Participants reported their age, gender, race/ethnicity, and marital status.

Education

We asked participants to report their highest level of education (i.e., less than high school, high school or General Educational Development (GED) degree, or any college).

We used the validated health literacy question "How confident are you filling out medical forms by yourself?" (not at all, a little bit, somewhat, quite a bit, extremely) (Chew, Bradley, & Boyko, 2004). We categorized somewhat or less confident as inadequate health literacy.

Housing history

Participants reported their duration of homelessness in each of three age ranges: 18-25, 26-49, and ≥ 50 . We combined these responses to calculate total years homeless as an adult. We assessed when participants had their first episode of homelessness, dichotomizing responses to ≥ 50 years versus younger than 50 years.

Involvement with the criminal justice system

Consistent with prior research, we included incarceration as a predisposing factor (Stein et al., 2007). To assess if participants had spent time in jail or prison, we asked if they had (a) spent a night in a city or county jail and/or (b) served any time in state or federal prison during the last 6 months.

Physical health status

To assess general health status, we asked participants to rate their health (fair or poor vs. good, very good, or excellent) (Ware, Kosinski, & Keller, 1996). To assess functional status, we asked participants if they had difficulty performing any of five activities of daily living (ADLs; bathing, dressing, eating, transferring, toileting) (Katz, 1983). We defined ADL impairment as self-reported difficulty performing at least one ADL. We assessed cognition using the Modified Mini-Mental State Exam (3MS). We categorized scores below the 7th percentile (1.5 standard deviations below a reference cohort mean) as cognitive impairment (Bland & Newman, 2001; Bravo & Hebert, 1997).

2.3.2 | Enabling factors

Enabling factors are conditions that allow individuals to access healthcare, or conditions that allow systems to make these services available (Andersen, 2008; Andersen & Newman, 1973; Gelberg et al., 2000). We included measures of access to physical healthcare, veteran status, and social support as enabling factors.

Usual source of care

We assessed whether participants had a usual source of care for physical health problems using items adapted from the National Health and Nutrition Examination Survey (Centers for Disease Control and Prevention, 2009). We asked participants if they had a usual place of care, defined as a place they usually go when sick or in need of health advice, excluding emergency departments. If participants identified a usual place of care, we asked if they had a primary care provider (i.e., physician, nurse practitioner, or physician's assistant). As a separate measure, we asked whether participants had a case manager, defined as someone working at an agency who talked about services or helped them to get services, in the past 6 months.

Veteran status

Because veterans may have access to additional services through the Veterans Affairs Medical Centers, we considered being a veteran to be an enabling factor. To assess veteran status, we asked participants if they had ever been on active duty in the Armed Forces, military reserves, or National Guard.

Social support

To assess social support, we asked participants to report how many close friends or family members they had to confide in (Gielen, McDonnell, Wu, O'Campo, & Faden, 2001). We categorized responses as having 0, 1-5, or at least six members in their social network.

2.3.3 | Need for behavioral healthcare

Andersen defined need as illness level, which includes an individual's perceived illness (Andersen & Newman, 1973; Gelberg et al., 2000). We assessed need using validated screening tools, examining mental health and substance use needs separately.

Need for mental health treatment

We defined having a need for mental health treatment by having a positive screen for depressive symptoms or posttraumatic stress disorder (PTSD) symptoms or reporting symptoms of other mental health problems, including anxiety, hallucinations, thoughts of suicide, or attempted suicide in the past 6 months. To assess current depressive symptoms, we used the Center for Epidemiologic Studies Depression Scale (CES-D), considering a score of ≥ 22 to be evidence of depressive symptoms (Cheng & Chan, 2005; Haringsma, Engels, Beekman, & Spinhoven, 2004; Radloff, 1977). We evaluated current PTSD symptoms using the Primary Care PTSD Screen (PC-PTSD), which asks participants to report whether they experienced any of four symptoms in the previous month due to a past experience: nightmares, avoidance of situations that reminded them of it, hypervigilance, or emotional numbing to their surroundings (Prins et al., 2003). We considered a score of four to be consistent with PTSD symptoms. To assess additional mental health problems (i.e., anxiety, hallucinations, thoughts of suicide, or attempted suicide), we used questions from the National Survey of Homeless Assistance Providers and Clients (NSHAPC), as adapted from the Addiction Severity Index (ASI) (Burt et al., 1999; McLellan et al., 1992) and considered a report of any of those symptoms to be evidence of other mental health problems. We considered anyone who met criteria for depressive symptoms, PTSD symptoms or other mental health problems to have a mental health need.

Need for substance use treatment

We assessed for alcohol use problems using the Alcohol Use Disorders Identification Test (AUDIT; Babor & Higgins-Biddle, 2002) and considered a score of ≥ 8 to indicate need for treatment. We assessed for problems with cannabis, cocaine, amphetamines, or opioids on the World Health Organization's (WHO) Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST). We considered a score of ≥ 4 for any of the substances to indicate the need for treatment (Humenuik, Henry-Edwards, Ali, Poznyak, & Monteiro, 2010). We considered anyone who met criteria for either alcohol or substance use problems to have a substance use need.

2.3.4 | Receipt of mental health or substance use treatment

To assess receipt of mental health treatment in the prior 6 months, we asked participants whether they had received outpatient care or whether a health care provider had prescribed medication(s) for an emotional or mental health problem in the prior 6 months. To define receipt of substance use treatment, we asked participants whether they had received treatment for an alcohol problem or been treated for a drug problem in the prior 6 months.

2.3.5 | Dependent variables

Unmet need for mental health treatment

To define unmet need for mental health treatment, we restricted the sample to those who met criteria for having a mental health need using the criteria above. We defined not having received treatment as not having received outpatient mental health treatment or not having been prescribed a medication for an emotional or mental health problem.

Unmet need for substance use treatment

To define unmet need for substance use treatment, we restricted the overall sample to those with an identified substance use need as defined above. We assessed the proportion of participants within this subsample who did not report having received any alcohol or drug use treatment in the prior 6 months.

2.4 | Statistical analysis

Drawing on Gelberg and Anderson's model, we examined factors associated with not having received mental health treatment among those with a mental health need (Gelberg et al., 2000). We included the factors listed above, which we identified a priori. In the model with unmet need for mental health services, we examined whether having an alcohol or drug use problem was associated with unmet need, considering them to be need factors (Koegel et al., 1999; Wenzel et al., 2001). We conducted a separate analysis to examine factors associated with not having received substance use treatment amongst those with an identified need; we again used the Gelberg and Anderson model and used factors listed above, which we identified factors a priori. In the substance use model, we tested whether having depressive symptoms, PTSD symptoms, or additional mental health problems, conceptualized as need factors, were associated (Koegel et al., 1999; Wenzel et al., 2001). We used logistic regression in these analyses.

To construct our models, we included only hypothesized variables with a bivariate p value of <0.20 in the full multivariate model. To define our reduced model, we conducted backward elimination, retaining independent variables with $p \leq .05$. Due to a skip pattern error, we incorrectly assessed 33 individuals using the AUDIT. To correct for this, we used multiple imputation to estimate the relationship between the treatment variables and the total AUDIT scores. We conducted multiple imputation analysis in STATA 14.2 (StataCorp, 2015). We used SAS 9.4 (SAS Institute Inc, 2013) to conduct our descriptive and logistic regression analyses.

3 | RESULTS

3.1 | Predisposing factors

We enrolled 350 participants, of whom 77.1% were men and 79.7% were Black American (Table 1). The median age was 58 (range: 50-80). Five percent (4.9%) of the sample was married or partnered. Seventy-four percent of participants obtained, at minimum, a GED or high school diploma. Less than half (41.6%) reported inadequate health literacy. The cohort had a median duration of years homeless as an adult of 2.2 years (interquartile range [IQR] = 0.8-8.0) and 43.4% had their first episode of homelessness after age 50. Ten percent (10.6%) of participants had spent time in jail or prison within the past 6 months.

Half of participants (55.7%) rated their health as fair or poor. Over one-third (38.9%) had at least one ADL impairment. A quarter (25.8%) screened positive for cognitive impairment below the 7th percentile.

TABLE 1 Baseline characteristics of homeless adults, aged 50 and older in Oakland, CA ($n = 350$)

Characteristic	All participants ($n = 350$)	Positive mental health screen ^a ($n = 195$)	Positive substance use screen ^b ($n = 254$)
	n or Median, (% or interquartile range (IQR))	n or Median, (% or interquartile range (IQR))	n or Median, (% or interquartile range (IQR))
<i>Predisposing factors</i>			
Demographics			
Age			
50–54	102 (29.1)	66 (33.8)	86 (33.9)
55–59	117 (33.4)	71 (36.4)	81 (31.9)
60–64	89 (25.4)	43 (22.1)	61 (24.0)
≥ 65	42 (12.0)	15 (7.7)	26 (10.2)
Gender			
Men	270 (77.1)	146 (74.9)	206 (81.1)
Race/ethnicity			
Black American	279 (79.7)	147 (75.4)	205 (80.7)
White	38 (10.9)	27 (13.8)	27 (10.6)
Hispanic/Latino	16 (4.6)	10 (5.1)	11 (4.3)
Asian American	3 (0.9)	2 (1.0)	1 (0.4)
Mixed/Other	14 (4.0)	9 (4.6)	10 (3.9)
Marital status			
Never married/ partnered	145 (41.4)	89 (45.6)	108 (42.5)
Separated/divorced	150 (42.9)	73 (37.4)	105 (41.3)
Widowed	38 (10.9)	23 (11.8)	29 (11.4)
Married/partnered	17 (4.9)	10 (5.1)	12 (4.7)
Education			
Less than high school	90 (25.7)	52 (26.7)	70 (27.6)
High school diploma/ GED	75 (21.4)	42 (21.5)	53 (20.9)
Some college or more	185 (52.9)	101 (51.8)	131 (51.6)
Inadequate health literacy	144 (41.6)	94 (48.7)	117 (46.4)
Housing history			
Total years homeless as adult	2.2 (0.8–8.0)	3.04 (0.71, 9.00)	3.00 (0.92, 8.75)
Age first homeless ≥ 50 years	152 (43.4)	69 (35.4)	99 (39.0)
Jail or prison in past 6 months	37 (10.6)	24 (12.3)	33 (13.0)
Health status			
Fair or poor health status	195 (55.7)	129 (66.2)	143 (56.3)
>1 ADL impairment ^c	136 (38.9)	92 (47.2)	100 (39.4)
Cognitive Impairment ^d	90 (25.8)	49 (25.3)	67 (26.5)
<i>Enabling factors</i>			
Social support			
0 Friends/family members	113 (32.5)	66 (34.0)	76 (30.0)
1–5 Friends/family members	205 (58.9)	115 (59.3)	156 (61.7)
≥ 6 Friends/family members	30 (8.6)	13 (6.7)	21 (8.3)
Usual place for healthcare	252 (72.0)	142 (72.8)	181 (71.3)

(Continues)

TABLE 1 (Continued)

Characteristic	All participants (n = 350)	Positive mental health screen ^a (n = 195)	Positive substance use screen ^b (n = 254)
	n or Median, (% or interquartile range (IQR))	n or Median, (% or interquartile range (IQR))	n or Median, (% or interquartile range (IQR))
Identified a primary care provider	184 (52.6)	100 (51.3)	131 (51.6)
Case manager	134 (38.3)	80 (41.0)	95 (37.4)
Veteran	76 (21.7)	37 (19.0)	54 (21.3)

^aCenter for Epidemiologic Studies Scare (CES-D) score ≥ 22, Primary Care Post Traumatic Stress Disorder screen (PC-PTSD) score ≥ 4, or Addiction Severity Index (ASI) severe anxiety, hallucinations, thoughts of suicide, or attempted suicide in past 6 months.

^bAlcohol Use Disorders Identification Test (AUDIT) score ≥ 8 or Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) score ≥ 4.

^cActivities of Daily Living (ADLs); bathing, dressing, eating, transferring, toileting.

^dCognitive impairment defined as a modified mini-mental state examination score below the 7th percentile (i.e., 1.5 standard deviations below the demographically-adjusted cohort mean).

3.2 | Enabling factors

Most participants (67.5%) reported at least one friend/family member. Most participants (72.0%) identified a usual place of care, half (52.6%) had a primary care provider, and 38.3% had a case manager (Table 1). One-fifth (21.7%) of participants had served in the military.

3.3 | Need for mental health treatment

One-third (38.3%) screened positive for depression (CES-D ≥ 22). (Table 2) Approximately one-fifth (17.7%) of the sample screened positive for posttraumatic symptoms (PC-PTSD ≥ 4). During the past 6 months, 39.0% experienced anxiety, and 14.5% experienced visual or auditory hallucinations (Table 2). Twenty-seven individuals (7.8%) endorsed experiencing suicidal ideation, two of whom reported making a suicide attempt within the past 6 months. More than half of the cohort (55.7%) met criteria for having a mental health need, by having a positive screen for any of these conditions (Tables 3-5).

3.4 | Need for substance use treatment

Approximately one-fifth (26.9%) had an alcohol problem; 64.6% met criteria for an illicit drug use problem. Cocaine was the most prevalent substance (43.1%), followed by cannabis (39.1%), opioids (12.9%), and amphetamine (8.0%). Almost three-quarters (72.6%) met criteria for substance use need.

3.5 | Receipt of mental health and substance use treatment

In the past 6 months, 25.1% received outpatient treatment/counseling or prescription medication. Fewer than one-fifth (16.0%) received outpatient mental health treatment and 22.0% had been prescribed prescription medication. Ten percent (10.3%) received any substance use treatment: less than five percent (4.6%) had received alcohol treatment and 7.1% had received illicit drug treatment.

Among those with mental health need, 38.5% received either outpatient or medication treatment: 24.6% received outpatient treatment and 34.4% had been prescribed medication. Among those with substance use need,

TABLE 2 Mental health and substance use problems (n = 350)

	n or Mean	% or Standard deviation (SD)
<i>Current symptoms (past 6 months)</i>		
CES-D ≥ 22	133	38.3
PC-PTSD		
Nightmares	104	29.7
Avoidance	158	45.1
Hypervigilance	155	44.3
Emotional numbing	135	38.6
PC-PTSD ≥ 4	62	17.7
ASI mental health questions		
Anxiety	134	39.0
Hallucinations	50	14.5
Thoughts of suicide	27	7.8
Suicide attempt	2	0.6
Any mental health problem ^a	195	45.4
AUDIT ≥ 8	94	26.9
ASSIST ≥ 4	226	64.6
Cocaine	151	43.1
Cannabis	137	39.1
Amphetamine	28	8.0
Opioids	45	12.9
Any substance use problem ^{b,c}	254	72.6

Abbreviations: ASI, Addiction Severity Index; ASSIST, Alcohol, Smoking, and Substance Involvement Screening Test; AUDIT, Alcohol Use Disorders Identification Test; CES-D, Center for Epidemiologic Studies Score; PC-PTSD, Primary Care Post Traumatic Stress Disorder screen.

^aCenter for Epidemiologic Studies Scale (CES-D) score ≥ 22 , Primary Care Post Traumatic Stress Disorder screen (PC-PTSD) score ≥ 4 , or Addiction Severity Index (ASI) severe anxiety, hallucinations, thoughts of suicide, or attempted suicide.

^bTen participants who had low use of illicit drugs were incorrectly assessed with the AUDIT but were included in the denominator.

^cAlcohol Use Disorders Identification Test (AUDIT) score ≥ 8 or Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) score ≥ 4 in past 6 months.

TABLE 3 Receipt of mental health and substance use treatment in the past 6 months

	All participants		Mental health problem ^a		Substance use problem ^b	
	n = 350		n = 195		n = 254	
	n	%	n	%	n	%
Mental health						
Outpatient treatment/counseling	56	16.0	48	24.6	44	17.3
Prescribed medicine for psychological/ emotional problem	77	22.0	67	34.4	62	24.4
Outpatient treatment/counseling and/ or prescription	88	25.1	75	38.5	70	27.6
Substance use						
Alcohol treatment	16	4.6	9	4.6	13	5.1
Illicit drug treatment	25	7.1	19	9.7	24	9.5
Alcohol treatment or illicit drug treatment	36	10.3	25	12.8	32	12.6

^aCenter for Epidemiologic Studies Score (CES-D) score ≥ 22 , Primary Care Post Traumatic Stress Disorder screen (PC-PTSD) score ≥ 4 , or Addiction Severity Index (ASI) severe anxiety, hallucinations, thoughts of suicide, or attempted suicide in past 6 months.

^bAlcohol Use Disorders Identification Test (AUDIT) score ≥ 8 or Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) score ≥ 4 .

TABLE 4 Unmet need for outpatient mental health treatment among those with mental health problems, $n = 195^{a,b}$

	Bivariable Models ^c		Reduced Multivariable Model	
	Odds ratio	95% confidence interval	Adjusted odds ratio	95% confidence interval
<i>Predisposing factors</i>				
Age				
≥65 years	4.4	1.0–20.5	9.6	2.0–47.1
50–64 years	Referent		Referent	
Gender				
Men	2.2	1.1–4.3	–	–
Women	Referent			
Illicit drug use problem ^d	0.6	0.3–1.0	–	–
Jail or prison in past 6 months	0.5	0.2–1.2	–	–
<i>Enabling factors</i>				
Regular healthcare location	0.3	0.1–0.6	–	–
Regular healthcare provider	0.3	0.1–0.5	0.2	0.1–0.5
Case manager	0.4	0.2–0.8	0.4	0.2–0.8

^aCenter for Epidemiologic Studies Score (CES-D) score ≥ 22 , Primary Care Post Traumatic Stress Disorder screen (PC-PTSD) score ≥ 4 , or Addiction Severity Index (ASI) severe anxiety, hallucinations, thoughts of suicide, or attempted suicide in past 6 months.

^bSeven cases were not included in the reduced multivariable model due to missing data.

^cWe present bivariable $p < .20$ in the unadjusted models.

^dAlcohol, Smoking, and Substance Involvement Screening Test (ASSIST) score ≥ 4 for amphetamines, cocaine, and opioids.

TABLE 5 Factors associated with unmet need for substance use treatment among those with substance use problems, $n = 254^{a,b}$

	Bivariable models ^c		Reduced multivariate model	
	Odds ratio	95% confidence interval	Adjusted odds ratio	95% confidence interval
<i>Predisposing factors</i>				
Age first homeless				
≥50 years	2.5	1.0–6.2	2.6	1.1–6.5
<50 years	Referent	–	Referent	–
CES-D $\geq 22^d$	0.5	0.2–1.1	–	–
Additional mental health problems ^e	0.4	0.2–0.8	–	–
Jail or prison in past 6 months	0.4	0.2–1.0	0.1	0.1–0.8
<i>Enabling factors</i>				
Case manager	0.4	0.2–0.9	0.4	0.2–0.8
Veteran status	2.9	0.8–10.0	–	–

^aAlcohol Use Disorders Identification Test (AUDIT) score ≥ 8 or Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) score ≥ 4 .

^bFive cases were not included in the reduced multivariable model due to missing data.

^cWe present bivariable $p < .20$ in the unadjusted models.

^dCenter for Epidemiologic Studies Score (CES-D).

^eAddiction Severity Index (ASI) severe anxiety, hallucinations, thoughts of suicide, or attempted suicide in past 6 months.

12.6% received alcohol or illicit drug treatment: 5.1% received alcohol treatment and 9.5% received illicit drug treatment.

3.6 | Factors associated with unmet mental health treatment need

In multivariable models assessing factors associated with unmet need for mental health care, we found that older age was associated with unmet need. Participants ages ≥ 65 years had a ninefold increased odds (adjusted odds ratio [AOR] = 9.6; 95% confidence interval [CI], 2.0-47.1) of having unmet need. Having a regular healthcare provider (AOR = 0.2; 95% CI, 0.1-0.5) and having a case manager (AOR = 0.4; 95% CI, 0.2-0.8) were associated with a decreased odds of unmet need. Being a woman, having substance use problems, having a regular healthcare location, and spending time in jail/ prison were associated with lower odds of unmet need in unadjusted models but did not retain significance in multivariable analysis.

3.7 | Factors associated with unmet substance use treatment need

In multivariable models assessing factors associated with unmet need for substance use care, we found that experiencing a first episode of homelessness at age 50 or older was associated with unmet need (AOR = 2.6; 95% CI, 1.1-6.5). Having a case manager (AOR = 0.4; 95% CI, 0.2-0.8) and spending time in jail/prison (AOR = 0.1; 95% CI, 0.1-0.8) were associated with decreased odds of unmet need. Depressive symptoms, additional mental health problems, and veteran status were associated with decreased odds of having unmet need but did not retain significance in multivariable models.

4 | DISCUSSION

In a population-based sample of older adults experiencing homelessness, we found a high prevalence of unmet need for mental health and substance use treatment. While the majority of participants had mental health and substance use problems, few received treatment. One-third of those with mental health need received mental health care. Fewer than 13% of those with substance use need received substance use treatment.

We identified predisposing and enabling factors associated with unmet treatment need. Adults aged 65 and over (compared to those aged 50-64) had a higher odds of unmet need for mental health treatment. Older adults are more likely to have competing demands, including higher physical health needs, which can interfere with receiving behavioral healthcare (Kuerbis et al., 2014; Wuthrich & Frei, 2015). Due to a shortage of geriatric psychiatrists and geriatric mental health care services, older adults may not have access to treatment when they seek care (Avari & Meyers, 2017; Kirwin et al., 2016). The homeless population age 65 and older is expected to triple by the year 2020 (Culhane et al., 2019). Thus, there is a need to design care that meets the needs of this growing, but underserved, population.

We found that having a regular healthcare provider was associated with less unmet need. Having a regular provider can increase engagement because primary care providers may help identify needs and refer to care. In safety-net systems, such as the ones in which our participants receive care, primary care providers may be the primary source of mental health treatment, by prescribing psychotropic medication. Primary care providers are responsible for an increasing proportion of prescriptions for psychotropic medication (Barkil-Oteo, 2013; Frank, Conti, & Goldman, 2005). In addition to prescribing medication for mental health conditions, primary care providers can refer patients to outpatient mental health counseling and treatment with specialist staff or providers. In some safety-net settings, mental health services may be colocated with physical health services via collaborative care models.

Collaborative care models (CCMs) can enhance information sharing and treatment plan collaboration and reduce barriers to care (Camacho et al., 2018; Chwastiak et al., 2018; Goodrich, Kilbourne, Nord, & Bauer, 2013; Watkins et al., 2017; Woltmann et al., 2012). CCMs are effective at reducing depressive symptoms and suicidal ideation among older adults (Bruce et al., 2004; Unutzer et al., 2002). CCMs are cost-efficient and can increase the capacity of resource-constrained settings to provide care for patients with complex needs (Katon et al., 2012; Woltmann et al., 2012). Federally Qualified Health Centers (FQHC) can bill for both a medical and mental health visit on the same day (Centers for Medicare & Medicaid Services, 2017), and recent changes to FQHC payment codes (Centers for Medicare & Medicaid Services, 2018) allow billing for behavioral health care management services in addition to the FQHC billable visit. Pay-for-performance programs link public hospitals' payments to care coordination and mental health treatment metrics (California Department of Health Care Services, 2018). It is possible that participants in our study were obtaining care in safety-net primary care settings with CCMs.

Alternatively, the reduced odds of unmet need amongst those who had regular care providers could reflect other factors that we did not measure. For example, having a regular care provider may be a marker for increased system engagement and reduced barriers to any type of care. Those who seek primary care may be more organized, knowledgeable about safety-net service availability, and have more access to transportation and other enabling resources. (Zur & Jones, 2014).

Having a case manager was associated with less mental health and substance use treatment need. In the case management brokerage model, case managers help people navigate care systems and provide a linkage to services. In the clinical case management model, case managers serve as care providers and may provide both mental health and substance use services directly (Mueser, Bond, Drake, & Resnick, 1998). In some models, such as intensive case management, case managers provide both brokerage and direct services (Hangan, 2006; Mueser et al., 1998). It is possible that the association between having a case manager and decreased odds of unmet need for both mental health and substance use services is a result of reverse causality; treatment programs may assign a case manager.

We found that participants who first became homeless at age 50 or older had a higher odds (compared to those with a first episode before age 50) of unmet substance use treatment need. Those with late onset homelessness had led more "typical" lives, with a higher likelihood of having been continuously employed and having been married or partnered (Brown et al., 2016). They were less likely to have had early onset of substance use problems, thus, they may have developed substance use problems more recently. These individuals may have been less aware of safety-net resources in general or resources for substance use treatment in particular.

Spending time in jail/prison in the past 6 months was associated with reduced unmet substance use treatment need. It is possible that participants initiated substance use treatment while incarcerated. However, most incarceration settings do not provide adequate treatment services. (Safran et al., 2009; Wilper et al., 2009) Alternatively, as a condition of release, participants may have been required to engage in substance use treatment. Our findings indicate there is a lack of community-based pathways into substance use care. By giving medication-assisted treatments, such as buprenorphine for opioid use disorder (Connery, 2015; Hser et al., 2016) and naltrexone for alcohol use disorder (Jonas et al., 2014) in primary care settings, primary care providers can begin to address this unmet need (Korthuis et al., 2017; O'Malley et al., 2003; Yeates & Thompson, 2008). However, there is a need for greatly expanded substance use services.

Our study has several limitations. We did not use a full psychiatric diagnostic interview. However, screening measures are important empirical tools for the referral of individuals to mental health treatment, especially when integrated care is available (Pignone et al., 2002). We did not ask participants where they received mental health services, thus we cannot determine whether they received care colocated with primary care, or treatment in mental health specific settings.

5 | CONCLUSION

Older homeless adults have a high prevalence of mental health and substance use problems. Despite their need for treatment, few participants accessed mental health or substance use treatment. Homeless adults age 65 and older

and those who become homeless later in life may need services tailored to their specific needs. Interventions that increase engagement with primary care, and integrate behavioral health care within primary care, could increase utilization of mental health and substance use treatment among older homeless adults.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

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