Title: Trends and Challenges in Rural Homeless Populations

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Discussion Points:

1. There is a need for a better understanding of the health care needs and barriers faced by homeless individuals living in rural areas in the United States.
2. Veterans are at a greater risk for homelessness than the general population.
3. Homeless veterans may have unique health care needs such as higher rates of mental illness, delayed medical disease presentation, and more substance misuse than the general population.
4. Further research is needed to guide efforts to meet the health care needs of homeless veterans.
5. Telehealth and other tools, such as web-based or mobile apps, may help improve health care access for rural homeless individuals by allowing patients to access health information or to record and monitor their own health-related data.

ABSTRACT.

Background: Homelessness is a significant public health issue in the United States. Living in rural locations has been associated with an increase in poverty. Additionally, it has been found that veterans are at greater risk for homelessness than the general population. The aim of this research was to characterize rural homeless veterans and non-veterans living in Nebraska, United States.

Methods: A cross-sectional study was conducted comprising 50 veterans and 64 non-veterans recruited from rural locations in Nebraska. Fully structured interviews were conducted by the research staff that consisted of questions regarding participant sociodemographics, housing, clinical characteristics, psychosocial factors, and utilization of health care and social services.

Results: In comparison to non-veterans, rural homeless veterans were found to be older, more qualified, and more likely to have ever been married. Veterans spent fewer nights in a shelter and more nights in a halfway house. Regarding clinical features, veterans were more likely to report posttraumatic stress disorder and alcohol misuse. Veterans also reported shorter travel times to reach health care services and used them more often compared to non-veterans.

Conclusion: These findings suggest that homeless veterans and non-veterans within rural settings have unique needs to be addressed when it comes to providing health care and social services, as well as in attempts to eliminating homelessness. Further research will help in the development of improved methods to support rural veterans and non-veterans.

Key Words: Homeless Persons, Veterans, Rural Health (Source: MeSH-NLM).

INTRODUCTION.

Homelessness has long been a major public health issue in the United States (U.S.). An estimated 552,830 individuals were homeless on a single night in 2018. Approximately 65% of these individuals were sleeping in sheltered locations and 35% were in unhospitable locations, including abandoned buildings, streets, and other places unsuitable for habitation.[1] Homelessness in the U.S. is predominantly in urban areas. As a result, urban homelessness has received more attention and is more widely studied than homelessness in rural areas of the U.S. Homelessness in the rural U.S. is currently under-recognized, poorly understood, and underrepresented in the available literature, making it more difficult to understand and adequately meet the needs of this population.[2] Approximately 19% of people in the U.S. live in rural locations, which cover 97% of the country's land surface area.[3] Rural areas have disproportionally more poverty; counties with persistent poverty are overwhelmingly rural with 95% of them being non-metropolitan.[4] Rural areas have also been found to rank poorly on 21 out of 23 population health indicators with higher levels of premature mortality, morbidity, and health degrading activities such as smoking.[5-6] The uneven distribution of health care resources may contribute to these disparities in conjunction with unique cultural factors that may reinforce negative health behaviors.[7] It has been historically difficult to identify and find homeless individuals in rural areas.[2] Therefore, there has been limited data on homelessness amongst veterans living in rural areas.

There is evidence that veterans are at a greater risk for homelessness than the general population.[8] A veteran is an individual who has served in active military service and was not dishonorably discharged. In contrast, a civilian has not participated in the armed forces. There are approximately 22 million veterans living in the U.S., compared to 900,000 in the United Kingdom, 415,000 in Australia, and 220,000 in Canada.[9] Given the size of its veteran population, there has been a much greater emphasis on veteran-focused health care and research in the U.S. than in other countries. Veterans are a unique subset of the homeless population due to their military service and access to government resources not available to civilians. Despite this, veterans have been reported to have a higher incidence of mental and physical illness than non-veterans, which may increase their risk of becoming homeless.[8,10-11] Although the number of veterans who are homeless has decreased since 2009, they continue to be overrepresented in the U.S. homeless population. Veterans account for approximately 7% of the U.S. population (328 million) but represent an estimated 8.6% of the homeless adults in the U.S.[1,12] Several studies have found that homeless veterans tend to be older, Caucasian, married, and more educated when compared to non-veterans.[10-11,13-14] Previous studies also suggest that veterans are more likely than non-veterans to report alcohol abuse or dependence, albeit another two large studies have reported that no such differences exist.[13,15] Moreover, there are mixed research findings available with regards to how homeless veterans and non-veterans compare with regard to clinical characteristics, as well as their utilization of housing, health care, and other supportive services.[11,13-15]

It is estimated that 5.3 of the 22 million veterans in the U.S. live in rural areas.[16] Further studies on homeless veterans in the rural population can help towards the mission to end veteran homelessness in the U.S. The goal of this study was to compare homeless veterans and non-veterans in rural Nebraska on sociodemographics, housing, clinical characteristics, psychosocial factors, as well as the use of health care and social services. The objective was to compare findings from this study with those from notable studies on homelessness to reveal similarities and/or unique differences in rural homelessness persons. This will help elucidate any existing

barriers to the mental and physical health of these understudied populations so that effective actions can be taken to better serve their needs.

MATERIALS OR PATIENTS AND METHODS.

Participants and Procedures

The study used a convenience sample consisting of 50 veterans and 64 non-veterans. Out of the 50 rural veterans, 39 were recruited between 2011 and 2014 by the Veterans Affairs (VA) Nebraska-Western Iowa Health Care System using flyers, referrals, and community outreach in multiple locations, including three shelters, one Veterans Health Administration (VHA) facility, one transitional housing facility, and a community center where a VHA-sponsored "Stand Down" event was held.[11] The 11 other rural veterans and all 64 of the rural non-veterans were recruited by Creighton University in 2016 via staff referrals and announcements made within homeless shelters. Inclusion criteria for an individual to participate in this study consisted of being greater than or equal to 19 years old and lacking a consistent, safe, and appropriate nighttime sheltered residence. Data was gathered by research staff who conducted structured interviews that lasted about 45-60 minutes. A $15 gift card was given to all participants. Ethical approval to conduct this study was obtained from the Institutional Review Boards of Creighton University and the VA Nebraska-Western Iowa Health Care System.

Study Sites and Descriptions

Homeless rural veterans were recruited by the VA from Nebraska micropolitan cities, namely Grand Island (n=37) and Hastings (n=2) from June 2011 to June 2014. In 2011, Grand Island had approximately 49,398 citizens and a total area of 29 square miles. A city was classified as micropolitan if it had a population of less than 50,000.[3] Grand Island's social services include a shelter and housing assistance; medical facilities include one hospital, one VHA facility, and outpatient clinics. During the sample recruitment period, Grand Island was classified as a micropolitan area but it is now defined as a metropolitan area due to an increased estimated population of 51,578 citizens in 2018.[12] Hastings covers 14 square miles and had a population of approximately 24,961 citizens in 2011.[17] Hastings has one hospital, several outpatient clinics, one shelter, housing assistance, and other supportive services.

The other homeless rural veterans and non-veterans were recruited by Creighton University from shelters in the Nebraska cities of North Platte (n=25), Kearney (n=23), and Hastings (n=27). Hastings has been previously discussed. When data were collected, North Platte had a population of 24,194 with an area of 13.9 square miles.[18] Kearney has a population of 33,021 citizens and an area of 12.77 square miles.[19] Medical facilities at both North Platte and Kearney include one hospital and outpatient facilities. There is one shelter with support services in each city.

Measures

The interview consisted of questions regarding sociodemographics (i.e. age, race, education, marital status, non-adult children, income), housing, clinical characteristics, use of health care and social services as well as psychosocial characteristics. In relation to their income, the participants were also asked if they had used any food stamps, state or local general assistance benefits, Social Security Disability (SSDI), Supplemental Security Income (SSI), SSI Drug Abuse and Alcohol (DA&A), or Temporary Assistance to Needy Families (TANF). Veterans were also asked if they had VA pension or VA service disability. Interview questions were standardized

to allow responses to be coded for analysis. Previous testing of validity and reliability of individual scales that comprised the structured interview have been reported previously.[20]

Housing

To assess the living conditions, participants were asked questions on where they resided the previous night and how many years they had been homeless in total. Transience was evaluated by asking the participants about how many cities they had lived in the past 5 years as well as how much time they had spent in their current area. They were also asked how many days that they had lived in a total of nine pre-defined settings, in the past 3 months. These settings included their own or another person's residence, a transitional site (halfway house, hotel, transitional housing, institution (prison, hospital), or actually homeless (shelter, outdoors). A 20-item scale by the Substance Abuse and Mental Health Services Administration Supported Housing Initiative was used to rate participants' satisfaction with their current living conditions.

Clinical Characteristics

To evaluate their physical health, the participants were asked a series of questions about 24 different medical conditions to comprise a medical severity score. To assess their mental health, participants self-reported substance use and mental health diagnoses. Specific to substance abuse, they were asked to self-report any alcohol or illicit drug use in the past 30 days. The Three Brief Symptom Inventory (BSI) subscales were used to measure distress relating to depression, anxiety, and psychoticism. The BSI includes 16 symptoms that are each rated on a scale from 0 to 4 (0=Never, 1=Almost never, 2=Sometimes, 3=Fairly often, 4=Very often). An observed psychotic behavior scale was also used to measure psychosis. This scale includes 10 behaviors that were evaluated based on observations of research staff during the interview. The ratings ranged from 0 to 3 (0=Not at all, 1=A little, 2=Some, 3=A lot); an average across all the ratings was also calculated to comprise the total scale score.

Psychosocial Characteristics

To measure social support, the participants identified categories of people (e.g. a spouse, adult child, parent, friend, or neighbor) who would help them in three proposed situations: transportation to an appointment, a short-term $100 loan, and someone to speak to if they were suicidal. The sum of the number of types of people ranged from 0-10. Participants were asked to rate their current quality of life from 1 to 7 (1=Terrible, 2=Unhappy, 3=Most dissatisfied, 4=Mixed, 5=Mostly satisfied, 6=Pleased, 7=Delighted).

Community integration of the participants was assessed by asking them about participation in 16 activities (e.g. visits with close friends/relatives/neighbours, visits to a grocery store) over the past 2 weeks. Number of activities ranged from 0 to 16, with higher scores demonstrating an increased community integration.

Religiosity was assessed using two items previously used in another published study on chronic homelessness.[20] Participants were asked about the importance of their religious beliefs in their lives and how helpful these beliefs have been in handling personal issues in the past 3 months. The scores ranged from 0 to 3 (0=Not at all, 1=Slightly, 2=Somewhat, 3=Extremely) and were averaged to form a total score.

Use of Healthcare and Other Services

Participants were asked if they had a physical health care provider, dental provider, mental health provider, a substance abuse treatment provider, and how much time was needed to travel to each provider. They were asked about utilization of inpatient overnight treatment, emergency room (ER) treatment, and ER or inpatient treatment for a mental health issue. Non-inpatient services were reported on, such as day hospital or program treatment, outpatient treatment, drop-in center, consumer support program services, and crisis intervention services. Related to substance use, they were asked if they had used the ER, inpatient and outpatient treatment for substance abuse; they reported on using Alcoholics Anonymous (AA), Narcotics Anonymous (NA) or another self-help group, and if they had received treatment in a residential/sober living program. Participants were asked how many months they had health insurance coverage over the past year. With regards to social service use, they were asked if they had met with someone to help with finding a job, to find housing, to help with a legal problem, and to help with public benefits or services. They were also asked if they had received educational classes or childcare services.

Data Analysis

The Chi-square and the Fisher's exact tests were used to compare survey questions by rural veteran status. Continuous variables were compared using the independent sample t-test. P-values less than 0.05 were statistically significant. Logistic regression was used to compare the odds of dichotomous outcome for rural veterans to rural non-veterans while controlling for age, gender, and education. ANCOVA models were used for continuous outcomes controlling for age, gender, and education. The Hosmer and Lemeshow goodness-of-fit statistic was calculated to assess model fit of the logistic regression models. The R-squared measure was used to assess the fit of the ANCOVA models. Non-veterans are the reference category for β coefficients. SAS software version 9.4 (SAS Institute, Cary, NC) was used for analysis.

RESULTS.

Sociodemographics

The homeless rural veteran and non-veteran groups were both majorly Caucasian. Veterans were found to be significantly older (p=0.0094). Additionally, veterans were found to have more education and were more likely to have ever been married than non-veterans. In addition, the rural non-veteran group included more female participants (31.2%, n=20) than the veteran group (4%, n=2). All participants' sociodemographic details are reported in **Table 1** below.

Housing

Veterans and non-veterans did not differ significantly in the total amount of time they had been homeless. Veterans were found to spend fewer nights in shelters over the past 3 months and were less likely to have been in the area they were surveyed for more than one year. Additionally, veterans stayed more nights in a halfway house or transitional housing than non-veterans. Multivariate analysis results for housing are shown in **Table 2**. After controlling for age, gender, and years of education, statistical significance was maintained in the findings tabulated above ($p<0.01$) excluding the sole finding that veterans spent more days in transitional housing ($p=0.1852$).

Clinical and Psychosocial Characteristics

Clinically, a significantly greater proportion of veterans reported posttraumatic stress disorder (PTSD) (42.0%, n=21) than non-veterans (18.7%, n=12). Regarding substance misuse, the veteran group reported higher alcohol abuse or dependence and alcohol use in the past 30 days. In addition, a greater proportion of veterans were observed to exhibit psychotic behaviors during their interviews. Results of multivariate analyses for clinical and psychosocial results are reported in **Table 2**. All of the above findings remained significant after controlling for age, gender, and education ($p<0.05$). Regarding psychosocial characteristics, the groups did not differ significantly in terms of average social support, subjective quality of life, community integration, or religiosity ($p>0.1$).

Use of Healthcare and Other Services

Veterans were found to have significantly shorter travel times to various health care providers including mental health providers and substance abuse treaters ($p<0.0001$). A larger proportion of veterans were also found to have received overnight inpatient medical treatment (26%, n=13), outpatient medical treatment (42%, n=21), and dental care (28%, n=14) in the past 3 months. For mental health treatment, a greater proportion of veterans reported using the services of a day hospital or treatment program (8%, n=4) or a drop-in center (8%, n=4). Substance abuse treatment was overwhelmingly used by veterans which included treatment through the emergency room (18%, n=9), inpatient stays (50%, n=25), as well as residential or sober living programs (38%, n=19). Results of multivariate analyses for health care and other service use can be found in **Table 3**. After controlling for age, education, and gender, the mental health treatment findings were no longer significant ($p>0.1$), but all other group differences remained significant ($p<0.01$). No group differences were observed for other service use in the past 3 months.

DISCUSSION.

This study aimed to compare homeless rural veterans and non-veterans on sociodemographics, housing, clinical characteristics, and psychosocial factors, as well as the utilization of health care and other services. A better understanding of these populations can elucidate ways on how to effectively improve the conditions of homeless veterans and civilians living in a rural setting. This study has concluded that both groups have many similarities, yet distinct differences were also observed between them. To summarize the key findings, (1) veterans were found to be older, more educated, and were more likely to have ever been married; (2) veterans stayed fewer nights in a shelter and more nights in a halfway house; (3) veterans were more likely to report PTSD and alcohol misuse; and (4) veterans had shorter travel times to health care services and used them more overall than the non-veterans. Multivariate analyses showed that most findings remained significant after controlling for age, gender, and education, suggesting that they are unlikely due to sociodemographic differences between groups.

The main study findings concerning sociodemographics were that homeless rural veterans were older, had more years of education, and were more likely to have been married, which is in-keeping with similar previous findings.[10-11] Three national studies have also similarly reported veterans to be older and have more educational years completed.[13-15] Two of the studies found that veterans were more likely to have been married than non-veterans.[13-14] Contrastingly, in this study, no racial differences were observed between the two groups.

Regarding housing, the two groups did not significantly differ in their total amount of time being homeless. To address transience, veterans were less likely to have been in their area for more than a year. Homeless individuals have been thought of as a highly mobile population.[21] This mobility can act as a barrier to accessing health care. Yet, the homeless, veterans and non-veterans, may not be as transient as once thought to be due to conflicting evidence, which gives reason for rural areas to provide more outpatient care and programs for the homeless population.[22] Veterans in this study also reported spending more time in halfway houses. This correlates with previous findings in that homeless veterans reside in a greater number of housing types and spend more time in transitional settings.[11,20] These transitional settings can serve as a pillar of support and community. Veterans may have greater accessibility through benefits and disability to these additional housing options than non-veterans. Previous studies suggest that rural homeless individuals tend to rely on social networks for housing.[23] It is possible that homeless individuals who rely on social connections were not captured in this study's sample, since participants were interviewed in shelters.

Clinically, veterans were not reporting more physical illnesses than non-veterans which contrasts with some reports.[10,20,24] Nevertheless, differences in their mental health were noted. A greater proportion of veterans reported having PTSD, more alcohol abuse/dependence as well as more alcohol use in the last month. The National Comorbidity Survey Replication estimated U.S. lifetime prevalence of PTSD to be 6.8%.[25] The lifetime prevalence of PTSD amongst all veterans varies based on when they served in the military but appears to be overall higher than in non-veterans.[26] Our results might be a reflection of the disproportionately higher prevalence of PTSD in veterans across the U.S. Homeless veterans in the urban setting have also reported

higher rates of PTSD than non-veterans.[11] Veterans may be more likely to develop PTSD due to experiencing combat and may also be more likely to self-report PTSD due to decreasing stigma of this diagnosis.

One of the most interesting findings in this study was that veterans reported greater alcohol use, dependence, and abuse, despite utilizing more substance abuse treatment than non-veterans. Higher alcohol use in homeless veterans versus non-veterans has been previously linked.[14] Similarly, other reports have also agreed that homeless veterans exhibit higher substance use.[10,24] This higher rate of substance use is especially concerning as it can act as a barrier to exiting homelessness. On the other hand, two national studies did not find any differences in reported substance use between veterans and non-veterans.[13,15] The higher rate of substance abuse treatment in veterans might reflect their access to VA services. The Housing and Urban Development-Veterans Affairs Supported Housing (HUD-VASH) program has housed many veterans with substance misuse disorders. This program has an active case management with clinicians who are trained to provide motivational interviewing for substance misuse disorders, yet other services may need to be provided to further address these disorders. Non-veterans may have a greater barrier to accessing health care providers in the rural setting. As a result, their substance misuse disorders may be underdiagnosed or simply might be that they have less need for these services. Data supports that a “Housing First” approach that places homeless individuals directly into housing versus a multistage continuum of care approach reduces substance misuse.[27] This could be a more effective approach to treating substance misuse disorders in the rural homeless populations.

Regarding the use of health care and other services, we found that veterans used more health services overall and were in closer proximity to various health care providers. This is in line with previous evidence that homeless veterans may have greater mental health and medical needs and may use certain health services more than homeless civilians.[10,15] Also, the greater utilization of acute care services by veterans may indicate that management of their chronic health conditions or psychosocial needs was not adequate.[28] Of note, it has been found that 8.5% of veterans have reported homelessness in their adult life, yet only 17.2% of those reported using VA homeless services; additionally, veterans who were Caucasian or living in rural locations were less likely to use VA resources for the homeless.[29]

This study has several limitations which need to be addressed. First, most data were self-reported by the participants which could introduce bias into the study, and different results might have been obtained if more objective measures had been used. Second, most veterans were recruited by the VA across a wider range of recruitment settings that included VA facilities, while non-veterans were all recruited by Creighton University using staff referrals and announcements at shelters. As a result, some of the results (e.g., use of housing, access to healthcare) may reflect selection bias. Also, as participants through the VA and Creighton University were not all recruited from the same cities, we cannot rule out the possibility of sampling bias. Third, we acknowledge that the use of multiple interviewers and the difference in when data were collected by the VA and Creighton University likely increased variability in our results. Fourth, as data were collected from a small, cross-sectional sample in rural Nebraska, the findings may not be generalizable to other geographical areas. Moreover, Nebraska is 88.3% Caucasian with less racial diversity than other states.[12] Additional studies in more diverse rural areas can help clarify if significant racial differences exist between homeless veterans and civilians.

Furthermore, the study sample was limited to individuals with access to shelters and may not be representative of rural homelessness in less accessible areas outside of shelters. Finally, the study sample was predominantly male, so the results may not generalize to women.

In conclusion, this study has reported on the characteristics of homeless veterans and non-veterans living in rural Nebraska. These results add further information to the available literature suggesting that these two homeless populations have unique needs. The VA has made strides tackling the needs of the veteran homeless population by greatly investing in telehealth. It has been found that health information technologies tools can support in-home care management for veterans who have been recently housed.[30] The implementation of VA Homeless Patient Aligned Care Teams (H-PACT) has also shown promising results in tailoring health care to the needs of homeless veterans.[31] Health care access among the homeless may also be enhanced through the use of web-based and mobile phone apps. Such tools can facilitate the delivery of health-related information and interventions, as well as allow individuals to record and monitor their own health data.[32] Further studies on homelessness in other rural locations in the U.S. are needed to further elucidate the barriers that these individuals are facing so that one may learn how to overcome them. Additionally, to better understand transience, surveys need to be conducted outside of shelters in rural areas.

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FIGURES AND TABLES.

Table 1. Sociodemographics of Rural Homeless Veterans and Non-Veterans

	Non-veteran (n = 64)	Veteran (n = 50)	Test of difference *t* or X^2 (df)	P value
Age, mean (SD, range)	41.80 (12.06, 20-66)	48.12 (13.63, 23-91)	-2.62 (112)	0.0094
Gender			13.38 (1)	0.0003
Male	44 (68.7%)	48 (96%)		
Female	20 (31.2%)	2 (4%)		
Race			1.74 (2)	0.42
White	51 (79.6%)	43 (86.0%)		
Black	4 (6.2%)	4 (8.0%)		
Other	2 (3%)	0 (0%)		
Years of education	11.56 (2.00)	12.86 (1.63)	-3.72 (112)	0.0003
Marital status			5.15 (1)	0.023
Never married	27 (42.1%)	11 (22%)		
Ever married	37 (57.6%)	39 (78%)		
Any children under 18	16 (34.8%)	24 (38.7%)	0.17 (1)	0.68
Worked for pay in past 30 days	34 (53.1%)	21 (42%)	1.39 (1)	0.24
Ever received income from				
SSI	9 (14%)	4 (8.0%)	1.01 (1)	0.32
SSDI	9 (14.0%)	6 (12.0%)	0.10 (1)	0.75
TANF	3 (4.6%)	1 (2.0%)	0.54 (1)	0.46
Aid to family with dep. child	4 (6.2%)	5 (4.3%)	1.12 (1)	0.29
State or local assistance	4 (6.2%)	4 (8.0%)	0.12 (1)	0.72
Food stamps	43 (67.1%)	26 (52.0%)	2.33 (1)	0.13
VA pension	0 (0%)	4 (8.0%)	5.42 (1)	0.020
VA service-connected disability	0 (0%)	16 (32%)	12.34 (1)	<0.0001

SSI: Supplemental Security Income; SSDI: Social Security Disability; TANF: Temporary Assistance to Needy Families; VA: Department of Veterans Affairs

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2 ***Table 2***. Housing, Clinical, and Psychosocial Factors of Rural Homeless Veterans and Non-Veterans

	Non-veteran (n = 64)	Veteran (n = 50)	Multivariate test β^ or OR* (95% CI)	Goodness of fit**	P value
Housing					
Lifetime months homeless	4.06 (8.19)	4.66 (7.46)	-0.1016 (-0.3741, 0.1709)	0.1155	0.4615
Housing in past 3 months					
Nights in own residence	9.95 (21.55)	14.00 (25.64)	3.3279 (-7.0104, 13.6662)	0.0122	0.5247
Nights in another residence	7.36 (16.41)	15.07 (26.88)	11.1481 (1.8657, 20.4305)	0.0675	0.0191
Nights in hotel	2.41 (12.43)	5.55 (14.95)	4.6574 (-1.3144, 10.6291)	0.0457	0.125
Nights in halfway house	2.19 (9.43)	16.22 (22.96)	14.0171 (6.7554, 21.2788)	0.1676	0.0002
Nights in transitional housing	1.17 (9.38)	10.32 (26.12)	5.3214 (-2.5905, 13.2333)	0.1277	0.1852
Nights in an institution	0.77 (3.17)	2.34 (8.35)	1.7291 (-0.886, 4.3442)	0.0291	0.1927
Nights in jail or prison	5.64 (18.04)	7.42 (19.30)	3.5456 (-4.6317, 11.7229)	0.0304	0.3919
Nights in a shelter	57.45 (33.18)	17.81 (28.59)	-41.8091 (-55.5693, -28.049)	0.2969	<0.0001
Nights outdoors, abandoned building, vehicle	2.11 (6.36)	8.73 (23.55)	4.9533 (-2.0873, 11.9938)	0.0557	0.1659
Nights in another place	0.39 (2.33)	1.46 (8.06)	0.9591 (-2.3809, 4.2991)	0.0366	0.5687
Length of time in area >1 year	29 (45.31%)	7 (14.0%)	0.234 (0.084, 0.657)		0.0058
# cities lived in past 5 years	2.88 (3.45)	3.72 (4.62)	0.1726 (-1.5834, 1.9285)	0.0520	0.8459
Satisfaction - current residence	7.43 (2.25)	7.86 (1.80)	0.1638 (-0.7136, 1.0412)	0.0692	0.7121
Satisfaction - current neighborhood	8.21 (2.06)	8.06 (2.55)	-0.04029 (-1.0303, 0.9497)	0.0291	0.9359
Clinical					
Mental Health					
Schizophrenia	11 (17.1%)	5 (10.0%)	0.724 (0.199, 2.637)	0.8907	0.6241
Bipolar disorder	16 (25%)	14 (28%)	1.226 (0.467, 3.221)	0.9552	0.6786
Major depression	36 (56.2%)	24 (48.0%)	0.896 (0.38, 2.112)	0.6622	0.8011
Posttraumatic stress disorder	12 (18.7%)	21 (42.0%)	3.988 (1.405, 11.321)	0.3805	0.0094
Adjustment reaction disorder	4 (6.2%)	2 (4.0%)	0.772 (0.124, 4.804)	0.4460	0.7816
Anxiety disorder	30 (46.8%)	24 (48.0%)	1.669 (0.668, 4.173)	0.5733	0.2732
Other mental health problem	3 (4.6%)	1 (2.0%)	0.948 (0.112, 8.027)	0.8066	0.9612
Substance Abuse					

Alcohol abuse/dependence	26 (40.6%)	36 (72.0%)	2.977 (1.214, 7.301)	0.3217	0.0171
Drug abuse/dependence	27 (42.1%)	22 (44.0%)	1.333 (0.559, 3.181)	0.4802	0.5172
Days of alcohol use in past 30 days	0.95 (3.43)	3.29 (6.94)	2.3455 (0.072, 4.6191)	0.0604	0.0433
Drug use in past 30 days	54 (84.3%)	40 (80.0%)	0.732 (0.235, 2.283)	0.7345	0.5906
Medical severity score	3.63 (2.70)	4.48 (4.39)	1.3029 (-0.1541, 2.76)	0.1224	0.0791
Observed psychotic behavior	0.05 (0.10)	0.17 (0.27)	0.1251 (0.04215, 0.2081)	0.1092	0.0035
Brief Symptom Inventory	1.21 (0.73)	1.21 (0.96)	0.1521 (-0.2053, 0.5096)	0.0437	0.4007
Psychosocial					
Community integration	5.98 (2.65)	5.20 (3.14)	-0.8158 (-2.0647, 0.4331)	0.0256	0.1982
Social support	1.92 (1.21)	2.19 (1.94)	0.3039 (-0.3763, 0.984)	0.0205	0.3778
Subjective quality of life	4.54 (1.39)	4.33 (1.29)	-0.08454 (-0.6888, 0.5197)	0.0237	0.782
Religiosity	3.02 (1.14)	3.11 (1.11)	0.04321 (-0.4435, 0.5299)	0.0219	0.8607

^ ANCOVA models with β coefficients and 95% confidence intervals corrected for age, gender, and education. Non-veterans are the reference category for β coefficients.

* Logistic regression with odds ratio (OR) and 95% confidence intervals corrected for age, gender, and education.

** R-squared values are reported for ANCOVA models. Hosmer and Lemeshow test p-values are reported for logistic regression models.

1 ***Table 3***. Health Care and Other Service Use of Rural Homeless Veterans and Non-Veterans

	Non-veteran (n = 64)	Veteran (n = 50)	Multivariate test β^ or OR* (95% CI)	Goodness of fit**	P value
Health service use					
Travel time to services (minutes)					
Physical health provider	45.75 (42.64)	20.87 (53.78)	-31.2748 (-51.9759, -10.5736)	0.0924	0.0034
Dental provider	87.63 (30.39)	26.02 (41.44)	-61.169 (-76.4355, -45.9025)	0.4529	<0.0001
Mental health provider	64.06 (44.12)	28.65 (43.03)	-43.6849 (-62.2695, -25.1002)	0.1906	<0.0001
Substance abuse treater	82.77 (35.15)	24.76 (40.67)	-56.0613 (-72.5107, -39.6119)	0.3768	<0.0001
Medical services, past 3 months					
ER treatment	18 (28.1%)	17 (34.0%)	2.235 (0.826, 6.052)	0.3366	0.1134
Inpatient treatment	4 (6.2%)	13 (26.0%)	7.098 (1.695, 29.726)	0.0043	0.0073
Outpatient treatment	15 (23.4%)	21 (42.0%)	2.821 (1.062, 7.49)	0.4150	0.0374
Dental treatment	4 (6.2%)	14 (28.0%)	4.631 (1.257, 17.056)	0.2802	0.0212
Mental health services, past 3 months					
ER treatment	2 (3.1%)	5 (10.0%)	2.053 (0.422, 9.98)	0.5386	0.3726
Inpatient treatment	4 (6.2%)	6 (12.0%)	1.534 (0.384, 6.126)	0.9271	0.5449
Outpatient treatment	26 (40.6%)	15 (30%)	0.635 (0.257, 1.567)	0.5650	0.3244
Day hospital or program treatment	0 (0%)	4 (8.0%)	7.08 (0.54, 92.911)	0.8989	0.1362
Drop-in center	0 (0%)	4 (8%)	6.584 (0.467, 92.898)	0.9713	0.1629
Consumer support program	0 (0%)	2 (4%)	6.533 (0.393, 108.644)	0.9652	0.1907
Substance abuse services, past 3 months					
ER treatment	0 (0%)	9 (18.0%)	55.225 (2.692, >999.999)	0.9844	0.0093
Inpatient treatment	3 (4.6%)	25 (50.0%)	15.643 (4.127, 59.292)	0.5922	<0.0001
Outpatient treatment	3 (4.6%)	7 (14.0%)	3.422 (0.728, 16.093)	0.0783	0.1194
Residential/sober living program	2 (3.1%)	19 (38.0%)	14.037 (3.157, 62.41)	0.7305	0.0005
AA, NA, or other self-help group	22 (34.3%)	26 (52.0%)	2.194 (0.895, 5.38)	0.2650	0.0858
Other service use in past 3 months					
Vocational	27 (42.1%)	19 (38.0%)	0.823 (0.343, 1.979)	0.8042	0.664
Housing	20 (31.2%)	19 (38.0%)	1.542 (0.617, 3.85)	0.7851	0.3538
Legal	10 (15.6%)	14 (28.0%)	2.474 (0.837, 7.311)	0.6629	0.1014
Help with public benefits or services	13 (20.3%)	16 (32.0%)	2.459 (0.886, 6.827)	0.1968	0.0841
Educational classes	5 (7.8%)	5 (10.0%)	2.445 (0.519, 11.517)	0.1150	0.2581
Crisis intervention services	3 (4.6%)	5 (10.0%)	1.811 (0.381, 8.614)	0.4395	0.4553

Child care services	1 (1.5%)	1 (2.0%)	2.56 (0.188, 34.903)	0.9715	0.4806

^ ANCOVA models with β coefficients and 95% confidence intervals corrected for age, gender, and education. Non-veterans are the reference category for β coefficients.

* Logistic regression with odds ratio (OR) and 95% confidence intervals corrected for age, gender, and education.

** R-squared values are reported for ANCOVA models. Hosmer and Lemeshow test p-values are reported for logistic regression models.

ER: Emergency room; AA: Alcoholics Anonymous; NA: Narcotics Anonymous