

A Comparison of Homeless Male Veterans in Metropolitan and Micropolitan Areas in Nebraska: A Methodological Caveat

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Abstract This study explored differences between homeless male veterans in metropolitan and micropolitan cities in Nebraska on sociodemographic, housing, clinical, and psychosocial characteristics as well as health service use. A convenience sample of 151 homeless male veterans (112 metropolitan, 39 micropolitan) were recruited from Veterans Affairs facilities and area shelters in Omaha, Lincoln, Grand Island, and Hastings in Nebraska. Research staff conducted structured interviews with homeless veterans. Results showed that compared to homeless veterans in metropolitan areas, those in micropolitans were more likely to be White, unmarried, living in transitional settings, and were far more transient but reported greater social support and housing satisfaction. Veterans in micropolitans also reported more medical problems, diagnoses of anxiety and personality disorders, and unexpectedly, were more likely to report using various health services and less travel time for services. Together, these findings suggest access to homeless and health services for veterans in micropolitan

areas may be facilitated through Veterans Affairs facilities and community providers that work in close proximity to one another. Many homeless veterans in these areas are transient, making them a difficult population to study and serve. Innovative ways to provide outreach to homeless veterans in micropolitan and more rural areas are needed.

Keywords Homelessness · Rural health · Veterans · Health services research

Introduction

Public concern about homelessness in the U.S. arose in the 1980s as the prevalence of homelessness increased and became more visible in metropolitan cities around the country (Breakey 1997; Burt 1992). The majority of homelessness in the U.S. has and continues to be centered in urban areas. As a result, most research has been limited to urban areas, and homelessness in rural America is a problem that has not been well-recognized or understood, and only minimally studied (Fitchen 1992; National Health Care for the Homeless Council 2013). As researchers have pointed out “urban homelessness may be more visible and receive more attention, but its rural counterpart remains far from trivial in magnitude” (p. 9; Lee and Price-Spratlen 2004).

According to the Federal Office of Rural and Health Policy and the Office of Management and Budget, rural areas are defined as areas located outside a Metropolitan Statistical Area, i.e., a city with a population of less than 50,000 (U.S. Department of Health and Human Services, n.d.). This definition of rural includes micropolitan cities (which have a population of at least 10,000 but <50,000) and other unclassified areas.

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About 19 % of the U.S. population live in rural areas, which covers 97 % of the land area in the country (U.S. Census Bureau 2010). Poverty in the U.S. is disproportionately rural with 17.7 % of people in non-metropolitan areas being poor while only 14.5 % in metropolitan areas are poor (DeNavas-Walt et al. 2013). Housing costs are often lower in rural areas, but so too are incomes. Income opportunities are limited in rural areas due to lower levels of educational attainment, less competition for workers, and fewer high-skill jobs (Aron 2006; Glasmeier 2014). Not surprisingly then, health disparities are found in rural compared to urban areas, including higher rates of premature mortality, morbidity, and chronic health conditions, and higher prevalence of risk factors such as smoking (Bennett et al. 2008; Eberhardt and Pamuk 2004). These disparities in rural areas may be due to uneven distribution of healthcare resources and services (Ricketts 1999; Wagenfeld 1990) as well as other unique environmental and cultural factors that affect health behavior and health (Hartley 2004). As a result of these, homelessness remains a problem in rural areas. The extent and prevalence of rural homelessness has been difficult to estimate given barriers in finding and identifying homeless adults in rural settings (National Health Care for the Homeless Council 2013; Toomey et al. 1993).

Homelessness among U.S. military veterans is of special concern given their service to the country and the amount of government resources dedicated to their healthcare and well-being. The Veterans Health Administration (VHA) is committed to preventing and ending veteran homelessness (O'Toole et al. 2013), but there has been little study of rural homeless veterans. An estimated 5.3 of the 22 million U.S. veterans live in rural areas of the country (VHA Office of Rural Health 2014). We conducted a literature search and could not find any published studies examining differences in sociodemographic characteristics and clinical needs between rural and urban homeless veterans. Rural health and homelessness are two distinct VHA priorities, but addressing the needs of rural homeless veterans, at the intersection of these two priorities, has yet to be examined.

In the current study, we had two aims: (1) to explore differences in sociodemographic, housing, clinical, and psychosocial characteristics of homeless male veterans in metropolitan and micropolitan areas; and (2) observe their use of a comprehensive array of health services. Based on the extant literature on rural health, we hypothesized that homeless male veterans in micropolitans would have lower socioeconomic status, greater noninsurance, and use fewer health services as well as experience greater difficulty accessing services than those in metropolitans.

Methods

Study Sites

Homeless veterans were recruited from VHA facilities and area shelters in metropolitan cities Omaha and Lincoln, and micropolitan cities Grand Island and Hastings in Nebraska from June 2011 to June 2014 (but only three veterans were recruited in 2014). For this study, homelessness was defined as any current use of VHA homeless services or stay at a shelter or transitional housing facility. In Omaha and Lincoln, individuals were recruited from one VHA facility, 4 shelters, 2 transitional housing facilities, and one community center used for the annual VHA-sponsored "Stand Down" event. In Grand Island and Hastings, individuals were recruited from one VHA facility and one shelter. All of the shelters were non-VHA sites, however some of them had contracts with VHA to fund transitional housing arrangements.

Site Descriptions

There were considerable differences in the population size, geography, and availability of local medical and social services in each of the four cities in the study. Omaha is the largest city in Nebraska with a population of approximately 423,133 in 2011 (U.S. Census Bureau 2015), covering a total area of 131 square miles. There were various medical facilities in the Omaha metropolitan area including 14 hospitals, outpatient clinics, and one VHA facility, along with various comprehensive social services. Lincoln is the second largest city in Nebraska with a population of approximately 262,156 in 2011 (U.S. Census Bureau 2015), covering a total area of 92 square miles. Medical facilities in Lincoln include four hospitals, outpatient clinics, and one VHA facilities along various shelters, housing assistance, and other supportive services.

Grand Island had a population of approximately 49,398 in 2011 (U.S. Census Bureau 2015), covering a total area of 29 square miles. Grand Island was considered a micropolitan area during the majority of the study, but is now considered a metropolitan area. Medical facilities in Grand Island included one hospital, outpatient clinics, and one VHA facility. Social services include one shelter, housing assistance, and other supportive services. Hastings had a population of approximately 24,961 in 2011 (U.S. Census Bureau 2015), covering a total area of 14 square miles. Medical facilities in Hastings included one hospital and outpatient clinics. Social services included one shelter, housing assistance, and other supportive services.

Consistent with the definition used by the Federal Office of Rural and Health Policy and the Office of Management

and Budget, Omaha and Lincoln were considered urban areas because they were Metropolitan Statistical Areas with populations 50,000 or greater (U.S. Department of Health and Human Services, n.d.), while Grand Island and Hastings were considered micropolitan or rural areas because they had smaller populations. This definition is one of two definitions of “rural” used by the federal government. It may be notable that the other definition used by the U.S. Census Bureau definition would classify Grand Island and Hastings as “urban clusters” rather than rural areas (U.S. Department of Health and Human Services, n.d.).

Participants and Procedures

The study sample consisted of a total of 151 homeless male veterans, 112 from metropolitans (97 from Omaha and 15 from Lincoln) and 39 from micropolitans (36 from Grand Island and 3 from Hastings). Participants were recruited using flyers displayed at VA and non-VA facilities (e.g., shelters, transitional housing units) and other prominent public locations, as well as through staff referral and community outreach (e.g., VA “Stand Down” event). A total of 90 veterans were recruited from VA facilities compared to 61 veterans from non-VA facilities. Participants completed structured interviews with research staff, which typically took 45–60 min and they were compensated for their participation with a \$15 gift card. No veterans refused to participate, but two veterans who provided informed consent did not complete the survey and their data were not utilized. All veterans who participated were men, except for two female veterans who were inadvertently enrolled in the study. Data from female veterans and three veterans who did not report their gender were excluded from this study.

Measures

Research staff conducted structured interviews with participants beginning with sociodemographic information, which included age, race, education, marital status, any non-adult children, and income. Income was divided into employment income, public support income (e.g., social security, food stamps, disability compensation), and other income (e.g., pension, panhandling).

Housing

Participants were asked the number of nights during the previous 3 months in which they stayed in each of nine settings, which were collapsed into five categories: their own place (own apartment, room, or house), someone else’s place (someone else’s apartment, room, or house), transitional setting (hotel, half way house, residential

program, or transitional housing), institution (hospital or prison), and literally homeless (shelter, outdoors, in vehicles, or abandoned buildings). Participants were also asked which of these settings they stayed in the previous night. Residential transience was evaluated through questions concerning how long they planned to stay in the local area, the number of different cities they have lived in the previous 5 years, and how long they had been homeless and incarcerated (if at all) in their lifetimes. These assessments methods have been shown to be appropriate and reliable in other studies of homeless adults (Rickards et al. 2010; Tsai et al. 2012).

Participants rated their level of satisfaction with their current living arrangement using a 20-item housing satisfaction scale developed by the Substance Abuse and Mental Health Services Administration Supported Housing Initiative (Center for Mental Health Services 2001; Tsemberis et al. 2003). This scale showed excellent consistency in this study ($\alpha = .90$) and has been field tested in a variety of housing settings and shown factorial and discriminant validity along with good test–retest reliability (Tsemberis et al. 2003).

Clinical Characteristics

Mental health and substance use disorder diagnoses were self-reported by participants and symptoms were assessed with several validated measures. Three subscales of the Brief Symptom Inventory (BSI; Derogatis and Melisaratos 1983) were selected to measure the major domains of subjective distress: psychoticism, depression, and anxiety. Participants rated 16 items like “nervousness or shakiness inside” and “the idea that someone else can control your thoughts” on a scale from 0 (never experience symptom) to 4 (very often experience symptom). The BSI has shown high convergent and construct validity, as well as good test–retest reliability and internal consistency (Derogatis and Melisaratos 1983). In this study, the BSI showed excellent internal consistency ($\alpha = .94$) and the BSI score presented is the mean value of the three subscales.

An observed psychotic behavior rating scale (Dohrenwend 1982) consisting of 10 types of behaviors (e.g., hallucinations, delusions, inappropriate behavior or speech) were rated by research staff based on their observations during interviews. Each of these behaviors was coded 0 (not at all) to 3 (a lot) based on staff observations, and the total scale score was computed as the average score across items. The internal consistency of the scale was marginally acceptable ($\alpha = .60$) and may be due to different staff rating the scale but unfortunately coder data were not collected so inter-rater reliability could not be evaluated.

Alcohol and drug use were assessed with two items from the Addiction Severity Index (ASI; McLellan et al.

1980) that asked participants about the number of days they drank alcohol at all in the previous 30 days and whether they used any drugs in the previous 30 days out of a list (e.g., heroin, cocaine, amphetamines, cannabis, hallucinogens).

Participants were asked about 24 different medical conditions, which were summed to form a medical severity score. The Short Form-12 Health Survey (SF12; Ware et al. 1998) was used to assess overall level of physical and mental functioning. The SF-12 consists of 12 items which were used to compute norm-based scores for physical and mental health subscales, which both ranged from 0 to 100, with a score of 50 representing the mean level of functioning in the general population and each 10-point interval representing one standard deviation. The SF12 has been shown to be a reliable and valid outcome measure for adults who have severe mental illness and/or are homeless (Larson 2002; Salyers et al. 2000).

Psychosocial Characteristics

To evaluate whether participants were integrated into their communities, participants were asked whether they had participated in each of 16 common activities (e.g., visit with close friends/relatives/neighbors, visit a grocery store, go to a restaurant) during the previous 2 weeks (Katz 1963). The number of activities reported was summed for a score ranging from 0 to 16 with higher scores indicating greater participation in community activities.

Social support was assessed by asking participants the number of types of persons who would be available to help participants regarding three different types of assistance: a short-term loan of \$100, a ride to an appointment, or someone to talk with if they felt suicidal (Vaux and Athanassopoulou 1987). The total mean number of types of persons was calculated with scores ranging from 0 to 10.

Religiosity was assessed with 2 items used in a previous study of chronically homeless adults (Tsai and Rosenheck 2011) that asked participants how important their religious belief/faith has been in their life and how helpful their religious belief/faith has been in dealing with personal problems in the previous 3 months on a 4-point scale from 0 (Not at all) to 3 (Extremely). Responses were averaged for a total score. Participants' subjective quality of life was assessed with one item (Lehman 1988) asking participants to rate their current life on a 7-point scale from 1 (terrible) to 7 (delighted).

Health Service Use

Participants were asked about health insurance coverage in the previous year and how long it took them to travel from their home to several providers, including their primary

care, dental, mental health, and substance abuse treatment providers. Participants were then asked detailed questions about use of various medical, dental, mental health, and substance abuse services in the previous 3 months, including emergency, outpatient, and other forms of these respective services. Specific use of VHA medical, mental health, substance abuse, and dental services in the previous 3 months were also assessed.

Data Analysis

A preliminary power analysis was conducted using G*Power software (Faul et al. 2009). With our unequal sample sizes, two-tailed tests with an alpha of .05, and an expected medium effect size ($d = .6$), we found statistical power for our analyses to be .89 which is an acceptable level of power for most analyses (Cohen 1977).

Bivariate analyses were conducted using t tests and Chi square tests to compare homeless male veterans in metro and micropolitan areas on sociodemographic, housing, clinical, and psychosocial characteristics, and health service use. Homogeneity of variance was tested with Levene's test and appropriate adjustments were made for t -tests when unequal variances could not be assumed. Several groups of variables including income, housing in past 3 months, and lifetime homelessness and incarceration showed non-normal distributions so these data were transformed using the equation $(X + 1)^{-1}$ to normalize the data before data analyses; all other variables were not transformed.

Because a large number of analyses were conducted which increased type I error, we mostly focused on findings that were statistically significant at the .01 level (which is an approximate Bonferonni correction to a .05 familywise error rate with sociodemographic, housing, clinical, and psychosocial characteristics each considered a separate family of variables). Effect sizes were also calculated to give estimates of the magnitude of effect rather than solely relying on statistical significance. Cohen's d or partial eta squared (η_p^2) was calculated for continuous variables and Cramer's V or Odds Ratios (ORs) for categorical variables. Confidence intervals were generated for Cohen's d using the noncentral t distribution (Wuensch 2012).

Multivariable analyses were conducted using analysis of covariance (ANCOVA) or logistic regressions to compare homeless veterans in metro and micropolitan areas on housing, clinical, and psychosocial characteristics controlling for sociodemographic differences. ANCOVAs and logistic regressions were also used for comparisons of service use patterns, controlling for sociodemographic and clinical differences. One multiple analysis of covariance (MANCOVA) was used to compare time traveled for services.

Supplementary analyses were conducted on only veterans who reported 1 year or more of lifetime homelessness ($n = 87$ in metropolitans and $n = 25$ in micropolitans) and the main findings of the study remained the same so only results of the full sample are presented below.

Results

Sociodemographics, Housing, and Health

Table 1 shows bivariate comparisons between homeless male veterans in metro and micropolitan areas. Veterans in micropolitans were significantly more likely to report being White and ever married than those in metropolitans. On housing, veterans in micropolitans reported staying more nights in transitional settings and institutions in the previous 3 months than those in metropolitans, but reported fewer nights literally homeless in the past 3 months and less lifetime incarceration. Veterans in micropolitans were much more transient than their metropolitan counterparts as evidenced by their reporting a shorter duration of time living in the local area and a more extensive history of living in multiple cities in the previous 5 years.

On measures of health status, veterans in micropolitans were more likely to report receiving a clinical diagnosis of posttraumatic stress disorder, other anxiety disorders, personality disorders, and alcohol use disorders than those in metropolitans. They also reported a greater number of medical problems and had higher observed psychotic behavior ratings, although the level of psychotic symptoms was low in both groups. On measures of psychosocial status, veterans in micropolitans nevertheless reported greater social support and satisfaction with their housing than those in metropolitans.

When multivariable analyses were conducted adjusting for sociodemographic differences (race and marital status), all bivariate differences remained significant except that there was no longer significant group differences on nights literally homeless ($d = .35$, $p = .08$) and major depression (adjusted OR 1.39, $p = .41$). Veterans in micropolitans still reported more nights in transitional settings ($d = -.76$, $p < .001$); more nights in institutions ($d = -.82$, $p < .001$); higher housing satisfaction ($d = 1.00$, $p < .001$); were less likely to have lived more than 6 months in the current area (adjusted OR .09, $p < .001$); reported living in more cities in the past 5 years ($d = .53$, $p < .01$); a greater number of medical problems ($d = .48$, $p < .01$); higher observed psychotic behavior ratings ($d = .46$, $p < .01$); and greater social support ($d = .55$, $p < .01$). They were also still more likely to report being diagnosed with posttraumatic stress disorder (adjusted OR

2.66, $p < .05$), other anxiety disorders (adjusted OR 3.75, $p < .01$), personality disorders (adjusted OR 4.81, $p < .05$), and alcohol use disorders (adjusted OR 4.81, $p < .05$) than veterans in metropolitans.

Repeated multivariable analyses on housing satisfaction and social support additionally controlling for differences in housing revealed that veterans in micropolitans still reported greater housing satisfaction ($d = .98$, $p < .001$) and social support ($d = .53$, $p < .01$) than those in metropolitans.

Health Service Use

Table 2 shows bivariate comparisons on health service use between homeless veterans in metro and micropolitans. Veterans in micropolitans reported spending less time traveling to receive health services, and reported using more of nearly all types of medical, mental health, and substance abuse services than those in metropolitans in the previous 3 months. Veterans in micropolitans were also more likely to report having used legal services in the previous 3 months than those in metropolitans.

Specific examination of reported use of VHA healthcare showed that there was no significant difference between homeless veterans in metro and micropolitans on use of VHA medical care (73.7 and 63.3 %, respectively; $X^2 = 1.35$, $p = .25$; $V = .10$), but those in micropolitans were more likely to report having used VHA mental health services (68.4 vs. 39.8 %; $X^2 = 9.23$, $p < .01$; $V = .25$), substance abuse treatment services (76.3 vs. 28.0 %; $X^2 = 27.08$, $p < .001$; $V = .43$), and dental services (43.2 vs. 12.5 %; $X^2 = 15.79$, $p < .001$; $V = .34$) than veterans in metropolitans.

Controlling for differences in sociodemographic and clinical characteristics, veterans in micropolitans continue to report shorter transportation time to health providers, less use of medical outpatient services, greater use of dental services, greater use of mental health and substance abuse inpatient services, and greater use of residential/sober living programs (shown in right-most column of Table 2). Veterans in micropolitans also continued to be more likely to report using VHA substance abuse treatment (OR 6.12, $p < .01$), and dental services (OR 5.34, $p < .01$) than those in metropolitans.

Analysis of rates of treatment across psychiatric diagnoses found no significant group differences, except for substance use disorders. Among those with alcohol use disorders, 28 of 31 (90.3 %) homeless veterans from micropolitans and 30 of 56 (53.6 %) homeless veterans from the metropolitans received treatment for alcohol use disorders in the previous 3 months, $X^2 = 12.13$, $p < .001$. Among those with a drug abuse/dependency, 16 (84.2 %) from the micropolitans and 27 (56.2 %) from metropolitans

Table 1 Sociodemographic, housing, clinical, and psychosocial characteristics of homeless veterans in metro and micropolitan areas

	Micropolitan (n = 39)	Metropolitan (n = 112)	Test of difference	Effect size cohen's d or cramer's V
Sociodemographics				
Age	48.1 (14.0)	51.3 (8.0)	t = 1.35	d = .32 (−.04 to .69)
Race- white	32 (84.2 %)	60 (54.1 %)	X ² = 10.90**	V = .27
Years of education	13.0 (1.6)	12.8 (1.8)	t = −.57	d = .11 (−.26 to .47)
Marital status- never married	7 (17.9 %)	40 (35.7 %)	X ² = 4.26*	V = .17
Any children under 18	12 (33.3 %)	23 (21.7 %)	X ² = 1.96	V = .12
Monthly income				
Employment income ^a	\$48.1 (176.1)	\$29.73 (137.0)	t = .85	d = .12 (−.24 to .49)
Public support income	\$195.8 (286.4)	\$162.3 (264.8)	t = −.69	d = .24 (−.12 to .61)
Other income	\$9.9 (59.7)	\$50.5 (181.5)	t = −1.84	d = .34 (−.02 to .71)
Housing				
Housing in past 3 months				
Nights in own place ^b	18.0 (28.2)	8.9 (24.5)	t = 2.28*	d = .34 (−.02 to .71)
Nights in someone else's place	13.6 (24.2)	14.6 (29.4)	t = 1.31	d = .04 (−.33 to .40)
Nights in transitional setting	40.5 (31.4)	15.7 (31.8)	t = 9.55***	d = .75 (.38 to 1.12)
Nights in an institution	8.9 (16.1)	1.5 (10.3)	t = 3.72**	d = .59 (.22 to .96)
Nights literally homeless	18.4 (27.8)	50.4 (40.1)	t = −2.59*	d = .82 (.45 to 1.20)
Current residence				
Own place	1 (2.6 %)	9 (8.2 %)	X ² = 42.77***	V = .54
Someone else's place	0 (0.0 %)	9 (8.2 %)		
Transitional setting	29 (76.3 %)	23 (20.9 %)		
Institution	1 (2.6 %)	0 (0.0 %)		
Homeless	7 (18.4 %)	69 (62.7 %)		
Housing satisfaction	4.2 (.5)	3.5 (.7)	t = −6.69***	d = 1.03 (.64 to 1.40)
Length of time in the area				
<1 month	18 (46.2 %)	4 (3.6 %)	X ² = 53.40***	V = .60
1–6 months	11 (28.2 %)	15 (13.6 %)		
>6 months	9 (23.1 %)	64 (58.2 %)		
Entire life	1 (2.6 %)	27 (24.5 %)		
# cities lived in past 5 years	3.2 (4.2)	1.1 (2.3)	t = −2.87**	d = .62
Lifetime months homeless ^c	47.1 (61.1)	58.4 (79.5)	t = .47	d = .14 (−.23 to .50)
Lifetime months incarcerated	10.1 (19.3)	26.8 (51.5)	t = −2.55*	d = .30 (−.07 to .66)
Clinical				
Mental health diagnosis^d				
Schizophrenia	1 (2.6 %)	8 (7.1 %)	X ² = 1.08	V = .09
Bipolar disorder	12 (30.8 %)	27 (24.3 %)	X ² = .62	V = .06
Major depression	20 (51.3 %)	38 (33.9 %)	X ² = 3.68	V = .16
Posttraumatic stress disorder	17 (43.6 %)	19 (17.0 %)	X ² = 11.29**	V = .27
Other anxiety disorder	21 (53.8 %)	21 (18.9 %)	X ² = 17.46***	V = .34
Personality disorder	7 (17.9 %)	4 (3.6 %)	X ² = 8.74**	V = .24
Substance abuse				
Alcohol abuse/dependence	31 (79.5 %)	56 (50.0 %)	X ² = 10.30**	V = .26
Drug abuse/dependence	19 (48.7 %)	48 (42.9 %)	X ² = .40	V = .05
# of medical problems	4.1 (3.7)	2.4 (2.4)	t = −2.69*	d = .61 (.23 to .98)
SF12- Physical health subscale	45.2 (11.2)	45.2 (11.8)	t = .01	d = .00 (−.08 to .08)
SF12- Mental health subscale	40.8 (7.4)	41.3 (7.3)	t = .40	d = .07 (−.29 to .44)

Table 1 continued

	Micropolitan (n = 39)	Metropolitan (n = 112)	Test of difference	Effect size cohen's d or cramer's V
Brief Symptom Inventory	1.2 (1.0)	1.2 (1.09)	t = −.09	d = .02 (−.35 to .38)
Observed psychotic behavior rating	.2 (.3)	.1 (.2)	t = −2.22*	d = .55 (.18 to .92)
Days of alcohol use, past month	3.9 (7.0)	2.3 (5.2)	t = −1.28	d = .28 (−.09 to .64)
Any drug use in past month (%)	9 (23.1 %)	16 (14.3 %)	$\chi^2 = 1.62$	V = .10
Psychosocial				
Integrated community activities	5.3 (3.2)	5.9 (3.1)	t = 1.10	d = .20 (−.16 to .57)
Social support	2.4 (2.1)	1.3 (1.2)	t = −2.85**	d = .69 (.31 to 1.06)
Subjective quality of life	4.2 (1.2)	3.9 (1.5)	t = −1.17	d = .22 (−.15 to .58)
Religiosity	3.2 (1.0)	3.1 (1.1)	t = −.60	d = .12 (−.25 to .48)

* $p < .05$, ** $p < .01$, *** $p < .001$

^a Data transformed values for employment income were .9 (.3) for rural and .9 (.2) for urban veterans; public support income were .5 (.5) for rural and .5 (.5) for urban veterans; and other income were 1.0 (.2) for rural and .9 (.3) for urban veterans

^b Data transformed values for nights in own place were .9 (.3) for rural and .7 (.5) for urban veterans; nights in someone else's place were .6 (.5) for rural and .8 (.4) for urban veterans; nights in transitional setting were .1 (.3) for rural and .7 (.4) for urban veterans; nights in institution were .7 (.5) for rural and 1.0 (.2) for urban veterans; and nights homeless were .5 (.5) for rural and .3 (.4) for urban veterans

^c Data transformed values for lifetime months homeless were .1 (.1) for rural and .1 (.1) for urban veterans; lifetime months incarceration were .6 (.4) for rural and .3 (.3) for urban veterans

^d Only one veteran from a metropolitan area did not respond to whether they've ever been diagnosed with bipolar disorder, anxiety disorder, or personality disorder

received treatment for this disorder in the previous 3 months, $\chi^2 = 4.63$, $p < .05$.

Discussion

The research on rural homeless veterans is sparse and we could find no previous empirical study specifically focused on homeless veterans in micropolitan or other rural areas. It should be stated from the outset that our study was fairly exploratory, was limited to homeless veterans in Nebraska, and that we classified micropolitan areas as rural consistent with a federal definition (U.S. Department of Health and Human Services, n.d.). Nonetheless, the data provide a rare examination of a minimally studied group. Rural homelessness often presents differently than urban homelessness due to dispersed settlement patterns and expansive geography (Fitchen 1992; Lee and Price-Spratlen 2004). Accordingly, we found that homeless veterans in micropolitans were more likely to be living in transitional settings and less likely to be literally homeless or living outdoors than urban homeless veterans. This may reflect the fact that we did not conduct outreach to isolated rural towns or wilderness settings. It has long been known that some veterans cope with past war trauma by living in isolation in the woods (Madigan 1986) and these veterans were not recruited in this study. This experience is in line with

studies on rural homeless adults (not specifically veterans) who have been found to be less visible, and more likely to be precariously housed or “living rough” than those “living on the street” or in formal emergency shelters in urban areas (Aron 2006; U.S. Government Accountability Office 2010). The findings also support the use of more inclusive definitions of homelessness in rural areas that are not limited to shelter use and literal homelessness (Springer 2000; Toomey et al. 1993).

The greater likelihood of homeless veterans in micropolitans to be living in transitional settings may partly explain their greater perceived social support and housing satisfaction than urban homeless veterans. Transitional settings like residential programs can offer peer support and a sense of community (Tsai et al. 2010). These findings are also consistent with previous studies that have found that rural homeless adults cope differently with their homelessness than their urban counterparts by relying on social networks and using various tactics to obtain short-term resources (Jackson and Shannon 2014; Trella and Hilton 2014).

Perhaps our most noteworthy finding is the transiency of homeless veterans in micropolitan areas. Homeless veterans in micropolitans were much more likely to be transient than those in metropolitan areas, with the large majority having stayed 6 months or less in their current area and living an average of three different cities in the past 5 years.

Table 2 Use of health and other services among homeless veterans in urban and rural areas

	Microropolitan (n = 39)	Metropolitan (n = 112)	Bivariate test of difference	Bivariate effect size ^a	Multivariable effect size ^b
Health service use					
Health insurance coverage, past year					
None	4 (10.3 %)	22 (19.8 %)	$X^2 = 3.95$	$V = .16$	OR 1.96 (.43–8.94) ^c
Less than a year	4 (10.3 %)	4 (3.6 %)			
All year	31 (79.5 %)	85 (76.6 %)			
Time to transport to services (minutes)					
Primary care provider	14.1 (39.9)	32.5 (42.9)	$t = 2.36^*$	$d = -.44$	$\eta_p = .05^*$
Dental provider	6.5 (19.9)	14.2 (27.0)	$t = 1.89$	$d = -.32$	$\eta_p = .06^{**}$
Mental health provider	2.8 (5.6)	21.3 (29.8)	$t = 6.24^{***}$	$d = -.86$	$\eta_p = .19^{***}$
Substance abuse treatment provider	2.3 (5.2)	16.8 (26.8)	$t = 5.43^{***}$	$d = -.75$	$\eta_p = .16^{***}$
Any medical services, past 3 months					
Emergency	17 (43.6 %)	23 (20.5 %)	$X^2 = 7.90^{**}$	$V = .23$	OR 1.42 (.52–3.86)
Inpatient	11 (28.2 %)	11 (9.9 %)	$X^2 = 7.72^{**}$	$V = .23$	OR 1.57 (.44–5.56)
Outpatient	16 (41.0 %)	74 (67.3 %)	$X^2 = 8.29^{**}$	$V = .24$	OR .22 (.08 to .61) ^{**}
Any dental services, past 3 months	12 (30.8 %)	7 (6.3 %)	$X^2 = 15.61^{***}$	$V = .32$	OR 10.34 (2.44–43.75) ^{**}
Any mental health services, past 3 months					
Emergency	6 (15.4 %)	3 (2.7 %)	$X^2 = 8.23^{**}$	$V = .23$	OR 1.54 (.13–18.62)
Inpatient	7 (17.9 %)	4 (3.6 %)	$X^2 = 8.85^{**}$	$V = .24$	OR 18.71 (1.71–205.40) [*]
Outpatient	5 (12.8 %)	1 (0.9 %)	$X^2 = 10.57^{**}$	$V = .27$	OR .38 (.12–1.19)
Day program/clubhouse/peer support	9 (23.1 %)	1 (0.9 %)	$X^2 = 23.02^{***}$	$V = .39$	OR 32.52 (1.65–642.40) [*]
Any substance abuse treatment services, past 3 months					
Emergency	9 (23.1 %)	5 (4.5 %)	$X^2 = 11.76^{**}$	$V = .28$	OR 2.06 (.43–9.97)
Inpatient	23 (59.0 %)	19 (17.1 %)	$X^2 = 25.08^{***}$	$V = .41$	OR 5.63 (1.89–16.76) ^{**}
Outpatient	6 (15.4 %)	19 (17.1 %)	$X^2 = .06$	$V = .02$	OR .43 (.13–1.49)
Residential/sober living program	18 (46.2 %)	5 (4.5 %)	$X^2 = 38.19^{***}$	$V = .51$	OR 22.10 (5.19–94.03) ^{***}
Self-help (AA, NA)	22 (56.4 %)	26 (23.4 %)	$X^2 = 14.43^{***}$	$V = .31$	OR 2.70 (.95–7.66)
Other services, past 3 months					
Any vocational services	15 (38.5 %)	44 (39.3 %)	$X^2 = .01$	$V = .01$	OR 1.38 (.51–3.69)
Any housing support services	15 (38.5 %)	44 (39.3 %)	$X^2 = .01$	$V = .01$	OR .77 (.31–1.92)
Any legal services	12 (30.8 %)	15 (13.4 %)	$X^2 = 5.95^*$	$V = .20$	OR 4.50 (1.39–14.57)
Any help obtaining public benefits	12 (30.8 %)	34 (30.9 %)	$X^2 = 0.00$	$V = .00$	OR .96 (.35–2.62)

* $p < .05$, ** $p < .01$, *** $p < .001$

^a Cohen's d or Cramer's V

^b Partial eta squared (η_p) or adjusted odds ratio (aORs) values controlled for race, marital status, "other" income, number of medical conditions, observed psychosis rating, posttraumatic stress disorder, other anxiety disorders, personality disorders, and alcohol use disorders

^c Multivariable analyses were conducted on a dichotomous dependent variable of any health insurance or not

Homeless individuals who are transient and migrate from place to place may be difficult to serve because of their histories of residential instability and discontinuous healthcare (Parker and Dykema 2013; Sosin et al. 1990;

Tsai et al. 2011). Thus, this finding may have important implications for homeless providers in rural areas as they should anticipate the transient nature of their clients and tailor their interventions accordingly. Utilizing next-of-kin

and other informal contacts of clients may provide a way to track transient clients and sharing medical records may be crucial to coordinating care between providers in different areas. It cannot be determined with our data whether transiency is a cause or result of homelessness, and further research is needed to ascertain whether there may be adaptive reasons why some homeless individuals live transient lives (e.g., move around for opportunities, services, or as a preferred lifestyle). Additionally, some individuals may have moved from urban to rural areas, or vice versa, particularly if they have been transient so rural and urban homelessness cannot be neatly separated as discrete, permanent categories and our study provides only a cross-section of these states of homelessness.

Homeless veterans in micropolitan areas were moderately less healthy than their metropolitan counterparts, as evidenced by a greater number of medical problems and higher rates of anxiety and personality disorders, although findings about psychiatric disorders should be interpreted as exploratory because they were based on self-report. Nonetheless, unexpectedly, homeless veterans in micropolitan areas reported greater use of various medical, mental health, and substance abuse treatment services and shorter travel times for these services. One possible reason is that homeless veterans in micropolitan areas were more likely to use VHA healthcare, which includes an extensive national network of comprehensive services. Another possible reason is that homeless and health services in some micropolitan areas may be co-located or located in close proximity to each other, since these towns are geographically small and facilities thus may be located close together allowing those living in shelters or transitional settings easy access to health services. In fact, a paradox is that geographic isolation mobilizes some small towns to collaborate and provide an abundance of resources for homeless individuals (Edwards et al. 2009). Certainly, there are also many rural areas where state and local agencies operate with little coordination or awareness of one another and homeless individuals have to travel long distances to receive any services (Edwards et al. 2009).

Aware of some of these issues, VHA has established a national network of over 50 intensive case management teams in areas with low population density to serve severely mentally ill and homeless veterans called the Enhanced Rural Access Networks for Growth Enhancement (E-Range; Mohamed 2013, 2014). The VHA Office of Rural Health has been an important part of these efforts and may have a special interest in working with community providers and other stakeholders to ensure a close-knit system of services in these areas. In the past 5 years, VHA has also dramatically ramped up funding and resources for specialized homeless programs like the Housing and Urban Development-Veterans Affairs (HUD-VASH), Grant and

Per Diem, and Supportive Services for Veteran Families (SSVF) programs, which exist in urban and rural areas. Access to care in rural areas may become increasingly important with implementation of the Affordable Care Act (Tsai et al., in press) and also the Veterans Access, Choice, and Accountability Act, which allows veterans use of community health services that are reimbursable by VHA (U.S. Department of Veterans Affairs 2014). Thus, providers and administrators engaged in outreach and care coordination for rural veterans should be prepared for these new system changes.

Our experience conducting this survey reflects a methodological conundrum when studying and serving rural homeless populations. Studying rural homeless populations is difficult because sampling often only captures those already engaged in services and providing outreach is difficult because of the expansive rural geography. Our study had difficulty even surveying homeless individuals in micropolitan areas, as evidenced by our small sample size especially from Hastings. Other studies of homelessness in rural areas may also only include micropolitan areas and future studies need to consider sampling from more isolated areas (i.e., population less than 10,000 people). This is an important point to highlight so that we do not overlook the “invisible” or “submerged” rural homeless populations in need of services, who are especially difficult to both study and provide healthcare for (Lee and Price-Spratlen 2004). Committing adequate resources and supporting policies that aim to address rural homelessness in a variety of localities may be important in spurring new ways to reach rural homeless individuals. Technological advances, such as telemedicine and social media, may be leveraged to better serve rural populations (Madison et al. 2012), including those who are homeless.

In conclusion, homelessness among veterans in micropolitan areas often appears in transitional settings and homeless veterans in these areas are more transient and less healthy than their metropolitan counterparts. Homeless veterans who live in micropolitan areas close to healthcare facilities likely have easy access to various comprehensive services, but those who live outside of service areas may be difficult to identify and engage with. Additional innovative ways to provide clinical outreach and study rural homeless populations are needed.

This study had several limitations of note. First, as already mentioned, the data were based on veterans in Nebraska so generalizability of our findings to other states is unknown. Moreover, we focused only on male veterans because of sample size concerns regarding rural female veterans so findings may not hold true for female veterans. The research design was cross-sectional and the data relied on self-report, including diagnoses (the psychotic behavior rating scale was objective but had borderline internal

consistency), so no causal inferences can be made and further study is needed to validate these findings. Given the difficulty in sampling rural populations, we relied on a small convenience sample from micropolitan areas and conducted statistical comparisons with unequal sample sizes, which has its caveats (Hsu 1993). Future research is needed on larger samples in more remote rural areas and on devising better ways to obtain representative samples of rural homeless populations. Rural homeless veterans are an elusive, but necessary, group to study as communities across the country continue to work to implement systems to prevent and end homelessness.

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