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Persistent Homelessness and Violent Victimization Among Older Adults in the HOPE HOME Study

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Persistent Homelessness and Violent Victimization Among Older Adults in the HOPE HOME Study

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Table 1. Baseline Characteristics of Homeless Adults Age >50 Years (N = 350), Oakland California, United States, 2013-2014

	Total (N=350)	Experienced physical/ sexual victimization within past 6 mo. (N=37)
Sociodemographics and life history		
Age, Median years (IQR)	58.0 (54.0, 61)	57.0 (53.0, 59.0)
Men, No. (%)	270 (77.4)	27 (73.0)
Race/ethnicity, No. (%)		
Black	278 (79.7)	23 (62.2)
White	38 (10.9)	9 (24.3)
Hispanic/Latino	16 (4.6)	2 (5.4)
Mixed/Other	17 (4.9)	3 (8.1)
Less than high school education, No. (%)	89 (25.5)	9 (24.3)
Age at first homelessness		
≥50 years	152 (43.5)	17 (46.0)
≥1 years since last stable housing	233 (67.2)	24 (64.9)
Number of nights spent in unsheltered settings or emergency shelter, past 6 months		
0	10 (2.9)	1 (2.7)
1-7	13 (3.7)	1 (2.7)
8-120	137 (39.3)	14 (37.8)
≥121	189 (54.1)	21 (56.8)
Health status, No. (%)		
Fair or Poor	194 (55.6)	24 (64.9)
Chronic conditions		
0	61 (17.5)	7 (18.9)
1-2	183 (52.3)	13 (35.1)
≥3	115 (33.0)	17 (46.0)
Mental health and functional status		
Moderate-to-severe depressive symptomology, No. (%) ^a	133 (38.3)	23 (62.2)

Cognitive impairment, No. (%) ^b	89 (25.6)	9 (24.3)
≥1 ADL impairment, No. (%)	135 (38.7)	20 (54.1)

Table 1. Baseline Characteristics of Homeless Adults Age >50 (N = 350), Oakland California, United States, 2013-2014

Continued

	Total (N=350)	Experienced physical/ sexual victimization within past 6 mo. (baseline) (N=37)
Social support, No. (%)		
0 confidants	112 (32.3)	16 (43.2)
1-5 confidants	205 (59.1)	18 (48.7)
≥6 confidants	30 (8.7)	3 (8.1)
Alcohol and illicit substance use		
Heavy drinking ^c	39 (11.2)	5 (13.5)
Moderate-to-severe illicit drug use, No. (%) ^d	177 (50.7)	24 (64.9)
Experienced victimization before age 18		
Physical	116 (33.3)	15 (40.5)
Sexual	46 (13.2)	7 (18.9)
Physical or sexual	132 (37.8)	17 (46.0)
Victimization in adulthood (age 18 or later)		
Physical	178 (51.2)	37 (100.0)
Sexual	46 (13.2)	11 (29.7)
Physical or sexual	186 (53.3)	37 (100.0)
Any victimization during lifetime		
Physical	218 (62.6)	37 (100.0)
Sexual	70 (20.1)	12 (32.4)
Physical or sexual	231 (66.2)	37 (100.0)
Past six month victimization		
Physical	35 (10.1)	35 (94.6)

Sexual	6 (1.7)	6 (16.2)
Physical or sexual	37 (10.6)	37 (100.0)

Note. Mo = months; No = Number.

^a CES-D score ≥ 22 .

^b Cognitive 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).

^c 6 or more drinks on one occasion at least once monthly.

^d Moderate-to-severe illicit drug use past 6 months defined as a World Health Organization Alcohol, Smoking and Substance Involvement Screening Test score for either cocaine, methamphetamines, or opioids of ≥ 4 (range 0–39; higher scores indicate more problems).

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Table 2. Baseline Victimization Prevalence and Relationships to Harmer Among Homeless Adults Age >50 Years, Oakland California, United States, 2013-2014

	No. (%) (n=350)	Physical abuse	Sexual abuse
Victimization before age 18	132 (37.8)	116 (33.3)	46 (13.2)
Caregiver	26 (7.4)	31 (8.9)	7 (2)
Someone else	69 (19.7)	57 (16.3)	32 (9.1)
Both	38 (10.9)	28 (8.0)	7 (2.0)
Victimization in adulthood (after age 18)	186 (53.3)	178 (51.2)	46 (13.2)
Intimate partner	20 (5.7)	26 (7.4)	10 (2.9)
Someone else	120 (34.3)	117 (33.4)	29 (8.3)
Both	46 (13.1)	35 (10.0)	7 (2.0)

Table 3. Odds of Experiencing Recent Violent Victimization Over 3-Years in GEE Model Among Adults Age >50 Years Who Were Homeless at Baseline 2013-2014, Oakland California, United States

	OR	(95% CI)	AOR	(95% CI)
Women	1.36	0.89, 2.08		
Age	0.98	0.94, 1.02		
Race (Non-black vs. black)	1.86	1.25, 2.76	1.65	1.09, 2.50
Victimization before age 18	1.87	1.29, 2.71	1.75	1.19, 2.58
Homelessness (HEARTH)	2.17	1.54, 3.06	2.01	1.41, 2.87
Social support				
0 confidants (referent category)				
1-5 confidants	0.80	0.56, 1.16		
≥6 confidants	0.46	0.22, 0.94		
Substance use and mental health				
Heavy drinking ^a	1.92	1.25, 2.95	1.68	1.10, 2.57
Moderate-to-severe illicit drug use ^b	1.96	1.38, 2.78	1.72	1.20, 2.45
Moderate-to-severe depressive symptomatology ^c	1.69	1.17, 2.46		
Functional status				
Cognitive impairment ^d	1.12	0.75, 1.69		
≥1 ADL impairment	1.83	1.33, 2.52	1.73	1.25, 2.41

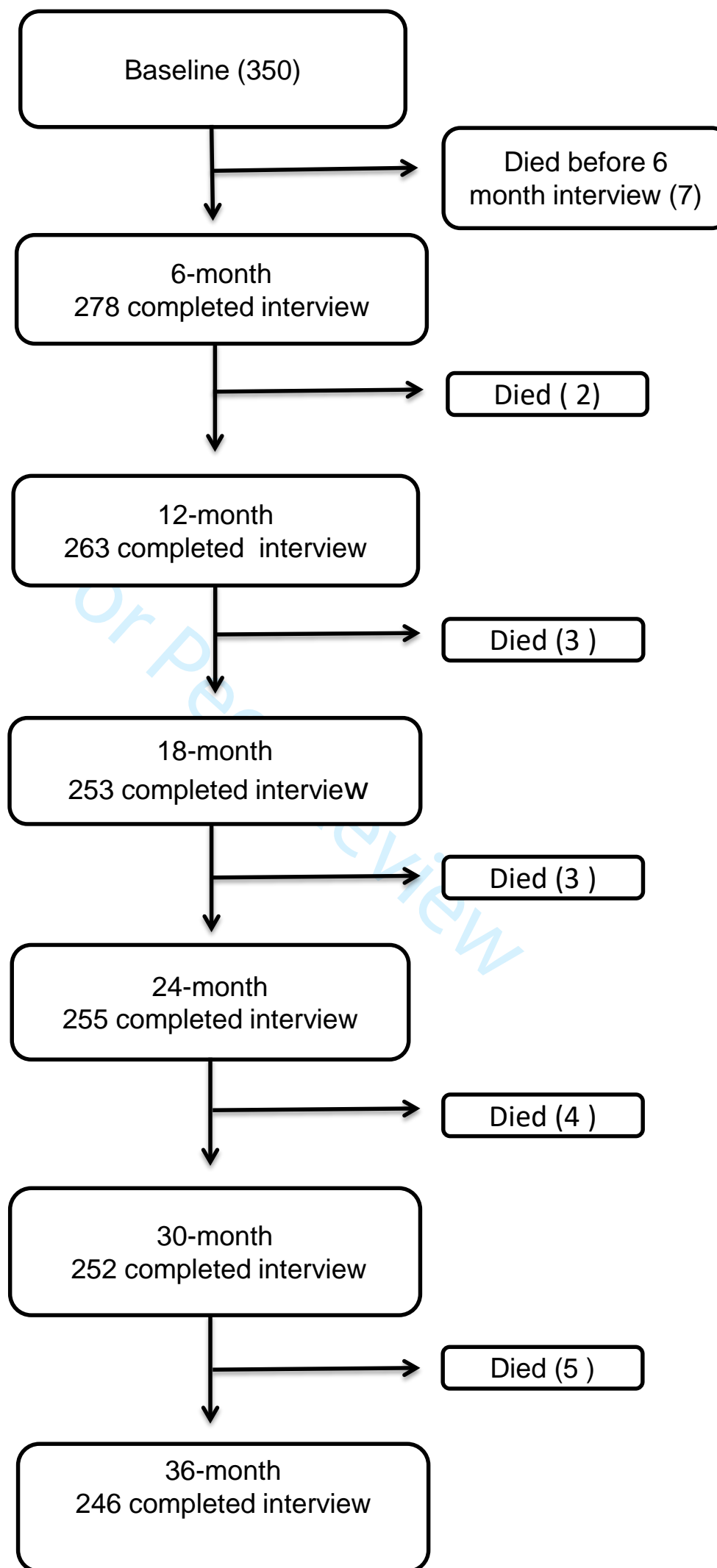
Note. GEE = Generalized Estimating Equations; OR = Unadjusted Odds Ratio; AOR = Adjusted Odds Ratio; CI = Confidence Interval; HEARTH = Homelessness Emergency Assistance and Rapid Transitions to Housing Act.

^a 6 or more drinks on one occasion at least once monthly.

^b Moderate-to-severe illicit drug use past 6 months defined as a World Health Organization Alcohol, Smoking and Substance Involvement Screening Test score for either cocaine, methamphetamines, or opioids of ≥4 (range 0–39; higher scores indicate more problems).

^c CES-D score ≥ 22.

^d Cognitive 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).



Appendix. Sensitivity Analysis Using Residential Calendar Nights Spent Unsheltered: Odds of Experiencing Recent Violent Victimization

	Unadjusted odds ratio (OR) (95% CI)	Adjusted odds ratio (AOR) (95% CI)
Women	1.36 (0.89-2.08)	--
Age	0.98 (0.94-1.02)	--
Race (Non-black vs. black)	1.86 (1.25-2.76)	1.07 (1.07-2.45)
Victimization before age 18	1.87 (1.29-2.71)	1.67 (1.13-2.47)
Nights spent in unsheltered settings or emergency shelter, past 6 months		
0	--	--
1-7	2.50 (1.07-5.82)	2.28 (0.95-5.48)
8-120	1.78 (1.13-2.81)	1.59 (0.99-2.54)
≥121	2.15 (1.44-3.20)	1.88 (1.24-2.85)
Social support		
0 confidants (referent category)	--	--
1-5 confidants	0.80 (0.56-1.16)	--
≥6 confidants	0.46 (0.22-0.94)	--
Substance use and mental health		
Heavy drinking ^a	1.92 (1.25-2.95)	1.66 (1.07-2.56)
Moderate-to-severe illicit drug use ^b	1.96 (1.38-2.78)	1.74 (1.21-2.50)
Moderate-to-severe depressive symptomatology ^c	1.69 (1.17-2.46)	--
Functional status		
Cognitive impairment ^d	1.12 (0.75-1.69)	--
≥1 ADL impairment	1.83 (1.33-2.52)	1.73 (1.24-2.43)

^a 6 or more drinks on one occasion at least once monthly.

^b Moderate-to-severe illicit drug use past 6 months defined as a World Health Organization Alcohol, Smoking and Substance Involvement Screening Test score for either cocaine, methamphetamines, or opioids of ≥4 (range 0–39; higher scores indicate more problems).

^c CES-D score ≥ 22.

^d Cognitive 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).

Persistent Homelessness and Victimization Among Older Adults in the HOPE HOME Study

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Persistent homelessness and violent victimization

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Abstract

The homeless population is aging; older homeless adults may be at high risk of experiencing violent victimization. In order to examine whether homelessness is independently associated with experiencing physical and sexual abuse, we recruited 350 adults, aged 50 and older in Oakland, California who met criteria for homelessness July 2013 and June 2014. We interviewed participants at 6-month intervals for 3 years in Oakland about key variables, including housing status. Using Generalized Estimating Equations, we examined whether persistent homelessness in each follow-up period was independently associated with having experienced physical or sexual victimization, after adjusting for known risk factors. The majority of the cohort was men (77.4%) and Black American (79.7%). At baseline, 10.6% had experienced either physical or sexual victimization in the prior 6 months. At 18-month follow-up, 42% of the cohort remained homeless. In adjusted models, persistent homelessness was associated with twice the odds of victimization (adjusted odds ratio [AOR] = 2.01; 95% confidence interval [CI]: 1.41, 2.87). Older homeless adults experience high rates of victimization. Re-entering housing reduces this risk. Policymakers should recognize exposure to victimization as a negative consequence of homelessness that may be preventable by housing.

Key words; sexual assault; elder abuse; community violence; violence exposure

Introduction

People experiencing homelessness have a heightened risk for physical and sexual victimization (i.e. **violent victimization**). (Christensen et al., 2005; Kushel, Evans, Perry, Robertson, & Moss, 2003; Wenzel, S. L., Leake, & Gelberg, 2000) **High rates of victimization among homeless adults may be due to shared risk factors for homelessness and victimization, or due to the dangerous environment of homelessness. Prior experiences of abuse, having mental health and substance use problems, and having limited social support are all associated with both homelessness and victimization.** (Brown, R.T. , Goodman, et al., 2016; Judges, Gallant, Yang, & Lee, 2017; Spinelli et al., 2017) **Early life victimization increases future victimization through its negative effects on mental health, self-esteem, self-efficacy, and ability to form relationships.** (Arata, 2006; Culatta, Clay-Warner, Boyle, & Oshri, 2017; DePrince, 2005; Dias, Sales, Mooren, Mota-Cardoso, & Kleber, 2017) **Mental health and substance use problems increase the risk of victimization by increasing the chance that people engage in conflictual intimate relationships, exposing individuals to social networks who engage in risky behaviors and distorting perception of risk.** (Silver, 2006) **Poor social support could increase the risk of victimization due to isolation, lack of social capital and reduced autonomy to protect against harm.** (Acierno et al., 2010; Hwang et al., 2009; Wenzel, S.L., Tucker, Elliott, Marshall, & Williamson, 2004). **Alternatively, the increased risk of victimization experienced by homeless individuals may be due to risks stemming from the dangerous environment of homelessness. Living in emergency shelters or unsheltered environments is characterized by instability, lack of privacy, lack of choice in where to stay, and the inability to control personal space or maintain distance from harmers, thus increasing the risk of victimization.** (Kushel et al., 2003)

Persistent homelessness and violent victimization

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3 **The median age of single homeless adults is increasing; a growing proportion of are**
4 **aged 50 and older.**(Montgomery, Cutuli, Evans-Chase, Treglia, & Culhane, 2013) **Due to**
5 **the premature development of geriatric conditions in homeless adults, adults aged 50 and**
6 **older are considered to be “older adults.”** (Brown, R.T., Hemati, et al., 2016; Brown, R. T.,
7 **Kiely, Bharel, & Mitchell, 2012)** Existing studies of victimization in homeless populations
8 **were completed** prior to the aging of the population.(Christensen et al., 2005; Kushel et al.,
9 2003) Little is known about violent victimization in older homeless adults. **While older adults**
10 **in the general population face a lower risk of victimization than younger adults, less is**
11 **known about older homeless adults. Older homeless adults may not share the relative**
12 **protections associated with aging that older adults in the general population experience.**
13 (Kushel et al., 2003; Morgan & Kena, 2017) Older homeless adults may face additional
14 **individual risk factors for victimization. For instance, homeless adults suffer from a high**
15 **prevalence of functional and cognitive impairments at earlier ages than the general**
16 **population. (Brown, R. T., Hemati, et al., 2016)** We hypothesize that these may limit
17 **capacity to recognize danger and to self-defend.**(Fang & Yan, 2017; Poole & Rietschlin,
18 2012; Williams, Racette, Hernandez-Tejada, & Acierno, 2017)

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41 **It is not known whether the elevated rates of victimization in homeless adults result**
42 **from an increased prevalence of risk factors for victimization, or the environment of**
43 **homelessness. Most prior research on victimization in homeless populations has used**
44 **cross-sectional research and treated homelessness as a static experience. (Dietz & Wright,**
45 **2008)** Cross-sectional research is not positioned to examine the association between changes
46 **in the lived environment and risk of victimization.** Homelessness is a dynamic state, marked
47 **by entrances and exits.**(Parsell, Tomaszewski, & Phillips, 2014) **This dynamic state allows us**
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Persistent homelessness and violent victimization

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3 **to examine the association between changes in housing status and risk of victimization over**
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5 **time in populations that experience homelessness.** Therefore, in a prospective cohort study we
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7 enrolled older adults when they were homeless and followed them for three years regardless of
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9 housing status. **Using Generalized Estimating Equations (GEE) models, we examine**
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11 **whether persistent homelessness (versus regaining housing) is associated with a higher risk**
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13 **for violent victimization, after adjusting for individual risk factors.** We hypothesized that
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15 homeless older adults would experience a high rate of violent victimization and that persistent
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17 homelessness would be independently associated with **victimization.**
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Methods

Design overview

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27 HOPE HOME (Health Outcomes of People Experiencing Homelessness in Older Middle
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29 Age) is a prospective cohort study of older homeless adults.(Lee et al., 2016) We recruited
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31 homeless adults aged 50 and older in Oakland, California and interviewed participants every 6
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33 months over a period of three years.(Lee et al., 2016) The institutional review board of the
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35 University of California, San Francisco approved the study.
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Setting and participants

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41 From July 2013 to June 2014, we recruited 350 homeless adults aged 50 years and older
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43 from overnight homeless shelters (n=5), low-cost meal programs (n=5), a recycling center, and
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45 places where unsheltered homeless adults stayed. We constructed our sampling frame to
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47 approximate the source population and randomly selected potential participants at each
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49 recruitment site.(Lee et al., 2016) Individuals were eligible to participate if, at the first interview,
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51 they were aged 50 or older, English-speaking, homeless as defined in the federal Homeless
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53 Emergency Assistance and Rapid Transitions to Housing (HEARTH) Act and able to give
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Persistent homelessness and violent victimization

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3 informed consent.(Dunn & Jeste, 2001; U.S. Congress, 2009) The HEARTH Act **is the Federal**
4 **definition of homelessness. It** defines someone as homeless if they 1) lack a fixed residence, 2)
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6 reside in a place not typically used for sleeping, or 3) are at imminent risk of losing housing
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8 within fourteen days.
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12 Trained study staff administered a structured enrollment interview and collected
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14 participants' contact information. To ensure follow-up, we asked participants to check-in with
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16 study staff monthly. If participants missed two or more check-ins, study staff called contacts and
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18 visited places where the participant frequented. We gave participants gift cards to a major
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20 retailer: \$25 for the screening and enrollment interview, \$5 for check-ins, and \$15 for follow-up
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22 interviews.
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Measures

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27 **Primary dependent variable: recent violent victimization.** Our primary dependent
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29 variable **was** having experienced physical or sexual victimization in the prior 6 months. **We**
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31 **adapted items from the Straus Conflict Tactics Scale to tailor them to homeless**
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33 **populations, focusing on severe forms of victimization. (Straus, Hamby, Boney-McCoy, &**
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35 **Sugarman, 1996)**
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40 At every interview, we asked “in the past 6 months, have you experienced physical
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42 violence by another person using an object like a gun or a knife, or did anyone ever slap, hit,
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44 punch, kick, choke, or burn you?” and “Has anyone pressured or forced you to have sexual
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46 contact, defined as touching your private parts in a sexual way, making you do something sexual,
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48 or making you have sex?” We dichotomized responses at each interview as having recently
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50 experienced either physical or sexual victimization.
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Persistent homelessness and violent victimization

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Primary independent variable: persistent homelessness. Our primary independent variable **was** homelessness at each follow-up interview, as defined by the HEARTH Act. ("Homeless Emergency Assistance and Rapid Transition to Housing Act of 2009. Definition of homelessness.," 2009) At each interview, we determined whether participants **met** HEARTH criteria for homelessness.

Time constant covariates. We assessed all time constant variables at baseline. Participants reported their sex and race/ethnicity. Participants reported whether they had experienced early life (before age 18) physical or sexual victimization (any versus none). (Straus et al., 1996) To assess cognitive function, we administered the Modified Mini Mental State Examination (3MS); we considered scores 1.5 standard deviations below an age- and education-adjusted reference mean (below the 7th percentile) to be cognitive impairment. (Bravo & Hebert, 1997)

Time varying covariates. We used participant's date of birth to calculate their age at each interview. We assessed other time varying covariates at each interview. For depressive symptoms, we considered individuals to have moderate-to-severe symptomatology if they scored ≥ 22 on the Center for Epidemiologic Studies Depression Scale (CES-D). (Wong, 2000) To assess functional impairment, we asked participants if they had difficulty performing activities of daily living (ADLs) and considered difficulty performing one or more ADLs as having functional impairment. (Katz, 1983)

~~HEALTHY COMMUNITY DEVELOPMENT CENTER~~
To assess social support, we asked participants to quantify the number of close confidants (defined as anyone in whom the participant could confide). We categorized these using validated categories (0, 1-5, or ≥ 6). (Gielen, A. C., McDonnell, Wu, O'Campo, & Faden, 2001; Gielen, Andrea Carlson, O'Campo, Faden, Kass, & Xue, 1994; Riley et al., 2014)

Persistent homelessness and violent victimization

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3 We considered participants who reported drinking ≥ 6 drinks on one occasion every
4 month as heavy drinkers.(Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) We assessed
5 illicit drug use (opioids, methamphetamine or cocaine) using the World Health Organization
6 Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) (6-month period; score
7 of ≥ 4 for one or more substance indicated moderate-to-severe illicit drug use). (Humeniuk,
8 Henry-Edwards, Ali, Poznyak, & Monteiro, 2010)

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17 **Descriptive victimization variables.** For descriptive purposes, at the baseline interview,
18 we asked participants if they had ever experienced physical and sexual victimization before and
19 after age 18. We asked participants to report their relationship to the person who committed the
20 victimization: for childhood (i.e. caregiver, someone else, or both) and adulthood (i.e. intimate
21 partner, someone else, or both).

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29 **Descriptive demographic variables.** Participants reported their education (i.e. high
30 school diploma/General Educational Development (GED) test equivalency versus less). We
31 asked participants the age that they first experienced adult homelessness and the time since last
32 stable housing. We assessed self-rated general health (fair or poor versus good, very good, or
33 excellent).¹⁵ We asked participants to report if a healthcare provider had ever told them they had
34 coronary artery disease or myocardial infarction; chronic obstructive pulmonary disease
35 (COPD), emphysema, chronic bronchitis, or asthma; cirrhosis or liver disease; congestive heart
36 failure; stroke or transient ischemic attack; arthritis; diabetes; kidney disease; cancer (excluding
37 non-melanoma skin cancer); or HIV/AIDS. We categorized participants as having 0, 1, 2, or 3 or
38 more chronic conditions.(Lee et al., 2016)

Statistical analysis

Persistent homelessness and violent victimization

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We chose independent variables based on prior research. We included variables that we hypothesized would be associated in older homeless adults based on the prior literature. We assessed bivariable associations between recent victimization and a priori independent variables using generalized estimating equations (GEE). We built our multivariable model by including variables with bivariable Type 3 *P* values <0.20 (2 sided), and reduced the model using backwards elimination retaining variables with *P* values <0.05 (2 sided) for our final multivariable model. We implemented our models in Stata using complete case analysis and robust confidence intervals (version 15; Stata Corp., 2017). To examine potential bias due to missed visits, we conducted a sensitivity analysis stratified by those who had completed all interviews versus those missing at least one interview.

To test if our results were robust across differing definitions of homelessness, we re-ran our analysis using a different definition of homelessness as our independent variable, defining homelessness as reporting, in a residential calendar, having spent any nights either unsheltered or in an emergency shelter in the prior 6 months. (Tsemberis, McHugo, Williams, Hanrahan, & Stefancic, 2006) We categorized variables (referent: 0 nights) as 1-7, 8-120, and 121 or more nights.

Results

Participants had a median age of 58 (IQR 54, 61). A majority of the sample were men (77.4%) and black (79.7%). One-quarter (25.5%) had completed less than a high school education. Nearly half (43.5%) were aged 50 or older at their first experience of homelessness. Over half (67.2%) lacked stable housing for over a year. (Table 1). At the 18-month follow-up interview, 42% of the cohort remained homeless.

At baseline, 11.2% reported heavy drinking; approximately half (50.7%) met criteria for

Persistent homelessness and violent victimization

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3 moderate-to-severe risk illicit drug use. Over one-third of participants had moderate-to-severe
4 depressive symptomology (38.3%). Over half had poor self-rated health (55.6%) and one-third
5 had three or more chronic conditions (33.0%). One-quarter had cognitive impairment (25.6%)
6 and over one-third had ADL impairment (38.7%).
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Lifetime, early life, and adulthood victimization

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16 At baseline, 10.1% of participants reported experiencing physical assault in the prior 6
17 months; 1.7% reported sexual assault and 10.6% reported experiencing either physical or sexual
18 assault. (Table 1). Over half of participants (66.2%) reported experiencing either physical
19 (62.6%) or sexual (20.1%) victimization in their lifetime.
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26 Over one-third (37.8%) reported having been either physically (33.3%) or sexually
27 (13.2%) assaulted before the age of 18. (Table 1) Over half, 53.3%, reported having experienced
28 violent victimization during their adulthood, 51.2% physical victimization and 13.2% sexual
29 assault. Participants were more likely to report that someone other than an intimate partner (in
30 adulthood) or caregiver (in childhood) victimized them. (Table 2)
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Factors associated with recent violent victimization

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41 In multivariable GEE models, participants who remained homeless at follow-up, as
42 determined by HEARTH criteria, were more likely to experience recent violent victimization
43 than those who became housed (Adjusted Odds Ratio (AOR)=2.01; Confidence Interval (CI):
44 1.41, 2.87). (Table 3) Identifying as non-black (versus black) (AOR=1.65; CI: 1.09, 2.50),
45 having experienced early life victimization (AOR=1.75; CI: 1.19, 2.58), reporting heavy drinking
46 (AOR = 1.68; CI: 1.10, 2.57) reporting moderate-to-severe illicit drug use (AOR=1.72; CI: 1.20,
47 2.45), and having an ADL impairment (AOR=1.73; CI: 1.25, 2.41) was associated with a higher
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Persistent homelessness and violent victimization

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odds of recent violent victimization. **Women, compared to men, had an elevated point estimate for experiencing victimization, although this did not reach statistical significance (AOR = 1.36; CI: 0.89, 2.08).**

In our secondary analysis, spending 1-7 nights (AOR = 2.28; CI: 0.95, 5.48), 8-120 nights (AOR = 1.59; CI: 0.99, 2.54), and 121 or more nights (AOR = 1.88; CI: 1.24, 2.85) unsheltered, as compared to no nights, was associated with an increased likelihood of recent victimization. (Appendix) All variables that were significant in the HEARTH model remained significant.

Missing data

We conducted three hundred-fifty baseline and 1,547 follow-up interviews. Seven participants died between the baseline and first follow-up interview. Of the 343 participants who survived to the first follow-up interview, 91.0% had at least one follow-up visit. The completion rate for each follow-up interview ranged from 74.9% to 81.0%. There were no missing data for sex, race, age, and HEARTH.

The independent variables in the multivariable model had between 0.1% to 4% missing data. Using complete case analysis, we excluded 1.4% of observations due to one or more missing variables in our primary model (using HEARTH criteria) and 5.0% in our secondary analysis (using number of nights spent unsheltered or in emergency shelters). The difference in the adjusted odds ratios for homelessness (based on HEARTH criteria) between those with complete (AOR = 1.70; CI: 1.11, 2.59) versus incomplete (AOR = 2.01; CI: 1.41, 2.87) follow-up had overlapping confidence intervals.

Discussion

In a population-based cohort of older adults who were homeless at baseline, we found rates of violent victimization more than ten times higher than experienced by older adults in the general population.(Acierno et al., 2010; Truman & Morgan, 2018) Participants who had persistent homelessness experienced twice the odds of victimization compared to those who regained housing, after adjusting for known risk factors. This finding was robust across different measures of homelessness. These results support our hypothesis that older homeless adults have an elevated risk of violent victimization and that the **dangerous** environment of homelessness contributes to the excess risk. Our findings suggest that housing may reduce this risk.

People experiencing homelessness lack choice in their environment, lack environmental controls that increase safety, and stay in crowded spaces in close contact with individuals who may have increased impulsivity and tendency towards violence.(Kushel et al., 2003) Crowding may increase stress levels and disputes that lead to violence. Stigma and dehumanizing language used to describe people experiencing homelessness may leave them vulnerable to attacks by bystanders. Due to past negative interactions, concerns regarding racial bias, the criminalization of behaviors associated with homelessness, and having prior criminal justice histories, people who are homeless may avoid contacting police when threatened. (Garland, Richards, & Cooney, 2010; Zakrison, Hamel, & Hwang, 2004)

Over 10% of our study participants reported physical victimization in the past six months at baseline, compared to 1.6% of older adults in the general population reporting physical victimization in the past year. (Acierno et al., 2010) The discrepancy in sexual victimization was even higher, despite the fact that three-quarters of study participants were men, who are less likely to experience sexual victimization.(Acierno et al., 2010) While in the general population,

Persistent homelessness and violent victimization

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3 rates of violent victimization decrease with age,(Truman & Morgan, 2018) we found rates
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5 similar to that found in studies of homeless adults younger than 50. (Riley et al., 2014; Roy,
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7 Crocker, Nicholls, Latimer, & Ayllon, 2014; Tsai, Weiser, Dilworth, Shumway, & Riley, 2015)
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11 The lower rates experienced by older individuals is thought to be due to their decreased
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13 likelihood of encountering “motivated offenders” and of being in environments that lack
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15 protections, either physical barriers or people who intervene and protect against violence.(Cohen
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17 & Felson, 1979) In the general population, the lower probability of these factors may outweigh
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19 the increased likelihood that people target older adults because of their perceived vulnerability
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21 due to frailty and inability to self-defend. Our findings suggest that homeless older adults lose
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23 the environmental protections experienced by older adults in the general community.
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28 We found that functional impairment was associated with victimization. **In the general**
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30 **population, functional impairment is associated with victimization however the direction**
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32 **and significance of this association varies by study population and measures of**
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34 **victimization.(Rosen et al., 2016; Williams et al., 2017) Our findings support our**
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36 **hypothesis that, in homeless populations, those with functional impairment would be a**
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38 **higher risk of victimization due to inability to self-defend while living in dangerous**
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40 **environments.**
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45 We found an association between early life victimization, heavy drinking, and illicit drug
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47 use with recent victimization, all known risk factors for victimization. These factors are more
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49 common in homeless, compared to non-homeless, populations and account for some of the
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51 increased risk. Addressing these risk factors could help reduce the risk of victimization.
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Persistent homelessness and violent victimization

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3 In our sample, of which approximately 80% of participants identify as Black, those who
4 were non-Black had higher odds of victimization. Black Americans are at 3-4 times increased
5 risk of homelessness, compared to non-Black populations. (Henry, Watt, Rosenthal, Shivji, &
6 Associates, 2017) This increased risk is thought to be due to structural risk factors, including
7 discrimination in housing, education, employment and criminal justice systems.(Olivet et al.,
8 2018) Thus, Black Americans who are homeless may have fewer individual risk factors for
9 **victimization. These differences may represent unmeasured confounders in our analysis.**
10 This may account for the lower odds of victimization among Black participants in this study.
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22 This study has several limitations. Within each six-month interval, we do not know the
23 temporal association with victimization and housing. It is possible that having a recent exposure
24 to victimization limited individuals' ability to regain housing. While we had high follow-up
25 rates, it is possible that missed visits may have been informative. For instance, if victimization
26 led to injuries that caused individuals to miss visits, our estimates would underestimate the true
27 rate. Our sensitivity analysis indicates that our estimate of the association between homelessness
28 and victimization was conservative. We did not assess whether there were differential risks
29 among homeless individuals living in unsheltered versus sheltered environments. Examining the
30 health-related sequelae of victimization is beyond the scope of this study. Further, we did not
31 collect data on whether the offender, when specified as someone other than an intimate partner,
32 was a stranger or known to the participant. **We did not find a significant association between**
33 **gender and victimization. This may be due to a lack of statistical power, due to the low**
34 **proportion of women among older homeless adults, and in our study sample.** These are
35 topics for future research.
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Persistent homelessness and violent victimization

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3 With the aging of the homeless population and the likelihood that older adults face even
4 greater health consequences from violent victimization, there is an urgent need to intervene to
5 prevent victimization. Healthcare providers caring for older homeless adults should be aware of
6 the risks of victimization and screen for injuries and for other sequelae, including post-traumatic
7 stress disorder. Prior studies have found **multiple** positive impacts of rehousing older homeless
8 individuals.(Brown, R. T. et al., 2015) Our findings extend these to suggest that rehousing older
9 adults may reduce the risk of experiencing violent victimization. The high risk of victimization
10 of frail older adults presents another compelling motivation for housing this vulnerable
11 population.
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For Peer Review

Persistent homelessness and violent victimization

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Table 1. Baseline Characteristics of Homeless Adults Age >50 Years (N = 350), Oakland California, United States, 2013-2014

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Table 2. Baseline Victimization Prevalence and Relationships to Harmer Among Homeless Adults Age >50 Years, Oakland California, United States, 2013-2014

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Persistent homelessness and violent victimization

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Table 3. Odds of Experiencing Recent Violent Victimization Over 3-Years in GEE Model Among Adults Age >50 Years Who Were Homeless at Baseline 2013-2014, Oakland California, United States

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Persistent homelessness and violent victimization

Figure 1: Study Population Recruitment (2013-2014) and Follow-Up Over 36 Months, Oakland California, United States

Figure 1 Legend. The figure shows the number of individuals enrolled at baseline and followed at 6-month intervals over 36-months' follow-up. Deaths between each follow-up are noted.

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Author Biographies

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