Title

Risk Factors for Falls in Older Adults Experiencing Homelessness: Results from the HOPE HOME Cohort Study

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Peer reviewed

1   Title: Risk factors for falls in older adults experiencing homelessness: Results from the HOPE
2   HOME cohort study
3   *Running Title: Falls in older adults experiencing homelessness*

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Abstract 300
References: 50
Tables: 2
Figures: 2
Article word length: 3,063

21   Key Terms: homelessness, vulnerable populations, falls

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2 ABSTRACT

3 Background: More than half of homeless adults are age ≥ 50 years. Falls are a common cause of
4 morbidity in older adults in the general population. Risk factors for falls in the general
5 population include poor health, alcohol use, and exposure to unsafe environments. Homeless
6 adults ≥ 50 have a high prevalence of known risk factors and face additional potential risks.
7 Objectives: To examine the prevalence of and risk for falling in a cohort of older homeless
8 adults.
9 Design: Longitudinal cohort study with participant interviews every 6 months for 3 years; data
10 analyzed using generalized estimating equations (GEE).
11 Participants: 350 adults aged ≥ 50 homeless at study entry recruited via population-based
12 sampling.
13 Measures: The dependent variable is any falls in prior six months; independent variables include
14 individual (i.e. illness, behaviors) and social/environmental factors (i.e., social support,
15 experiencing violence, living unsheltered).
16 Results: Over three-quarters of participants were men (77.1%) and Black (79.7%). The median
17 age was 58 (IQR 54, 61). At baseline, one-third (33.7%) reported a fall in the prior 6 months.
18 At follow-up visits, 23.1% to 31.2% of participants reported having fallen. In GEE models,
19 individual risk factors (non-Black race, being a women, older age, functional impairment,
20 urinary incontinence, history of stroke, and use of assistive devices, opioid, and marijuana) were
21 associated with increased odds of falls. Environmental and social factors (spending any nights
22 unsheltered (AOR = 1.42, CI 1.10-1.83) and experiencing physical assault (AOR = 1.67, CI
23 1.18-2.37) were also associated.
24 Conclusions: Older homeless adults fall frequently. Likely contributors include having a high
25 prevalence of conditions that increase the risk of falls, compounded by heightened exposure to
26 unsafe environments. Fall prevention in this population should target those at highest risk and
27 address modifiable environmental conditions. Providing shelter or housing and addressing
28 substance use could reduce morbidity from falls in homeless older adults.
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1 <u>INTRODUCTION</u>

2 In the United States, over half a million people experience homelessness each night.[1] The

3 proportion of single homeless adults over age 50 is increasing.[1]   Homeless adults age 50 and

4 over experience a higher prevalence of geriatric conditions (e.g. falls, urinary incontinence, and

5 functional, sensory, and cognitive impairments) than adults 20 years older in the general

6 population.[2,3]

7   In the general population, falls are prevalent, occurring in approximately one-third of

8 adults age 65 or older.[4,5] Falls are associated with adverse outcomes including restricted mobility,

9 deconditioning, and loss of independence.[6,7] In the United States, medical costs due to fatal and

10 non-fatal falls are approximately $50 billion a year.[5] Individual risk factors for falls include

11 medical problems (e.g. stroke, depression, functional and cognitive impairment), health-related

12 behaviors (e.g. tobacco or alcohol use)[8-11], and social factors (e.g. lack of social support).

13 Environmental triggers are factors external to the individual that heighten the risk for slipping or

14 tripping. These include surface (e.g. uneven exteriors, obstructive ground-level objects), ambient

15 (e.g. poor lighting), and weather-related conditions.[12,13]

16   Falls result from an interaction between an individual's underlying vulnerabilities and

17 their exposure to environmental conditions.[8,14] People experiencing homelessness have a high

18 prevalence of factors known to be associated with falls in the general population, including

19 chronic diseases, functional impairment, alcohol and opioid use problems.[2,15] Homeless older

20 adults have high prevalence of other factors that could be associated with falls, such as substance

21 use and heightened exposure to physical violence.[15,16]

22   People who are homeless live in a variety of environments, including homeless shelters

23 and unsheltered spaces that expose them to environmental hazards and violence. In each of these

1 settings, homeless individuals have limited control over their environment, especially when

2 living in unsheltered environments.

3   We examined the prevalence of and risk factors for falls in a longitudinal cohort of adults

4 aged 50 and older who were homeless at study entry. We hypothesized that homeless adults

5 would have a high prevalence of falls and high exposure to environmental hazards. We

6 hypothesized that factors known to be associated with falls in the general population would be

7 associated with falls in our cohort. We further hypothesized that several factors that are plausibly

8 related, but have not been studied (use of marijuana and stimulants, exposure to physical assault,

9 and uncontrolled environments), would be associated.

10 <u>METHODS</u>

11 *Study Overview*

12 We conducted a 3-year prospective cohort study of 350 homeless adults aged 50 and older, the

13 Health Outcomes in People Experiencing Homelessness in Older Middle agE (HOPE HOME)

14 study.[17] We interviewed participants at baseline and every 6 months for three years; at each

15 interview, trained research staff administered a structured interview and conducted clinical

16 assessments. The institutional review board of the University of California, San Francisco

17 approved this study. The datasets we analyzed during the current study are available from the

18 corresponding author on request.

19 *Study Sample*

20 Between July 2013 and June 2014, we recruited 350 adults age 50 or older who were homeless at

21 study entry. We recruited from all local shelters open to older adults (n=5), all free and low-cost

22 meal programs that served at least three meals a week (n=5), one recycling center, and areas

23 where adults slept unsheltered in Oakland, California (Figure 1). To create a sample that best

1   represented the target population, including the high number of people living unsheltered in

2   Oakland, we randomly selected potential participants using sampling frames that included

3   encampment sites, recycling centers, shelters, and meal programs.[18] We describe our Methods

4   in more detail elsewhere .[17-19]

5   Eligibility criteria included: (1) homeless according to the Homeless Emergency

6   Assistance and Rapid Transition to Housing Act (HEARTH) definition that includes any person

7   living unsheltered, staying in an emergency shelter, or facing eviction in the next 14 days, (2)

8   age 50 years or older, (3) English-speaking, and (4) able to provide informed consent as

9   determined by a teach-back mechanism.[20]Participants received $25 for the screening and

10   enrollment interview, $5 for monthly check-ins, and $15 for follow-up interviews.

11   *Measures*

12   *Outcome Variable*

13   Our primary outcome was self-reported falls in the prior six months, assessed at each study

14   interview. We defined falling as "a sudden, unintentional change in position from an upright

15   posture coming to rest on the floor or ground." For descriptive purposes, among participants

16   who reported a fall, we asked how many times the participant fell and whether they sought

17   medical treatment for their fall.

18   *Independent Variables*

19   *Individual Risk Factors*

20   We identified demographic risk factors as time-constant (assessed once at baseline) and other

21   risk factors, health status, and health-related behaviors as time-varying (assessed at each visit).

22   We assessed age, gender, and race/ethnicity.[21] In our analyses, we dichotomized race as

23   Black versus non-Black. Participants reported their highest educational attainment. We

classified participants as having graduated from high school or earned a General Educational

Development (GED) certificate versus no high school diploma/GED.

Health Status

Using modified questions from the National Health and Nutrition Examination Survey

(NHANES), we asked participants whether a healthcare provider told them they had: myocardial

infarction, congestive heart failure, stroke, arthritis, diabetes, or chronic lung disease (chronic

obstructive pulmonary disease or asthma); we included these as separate variables.[22] If a

participant reported a medical condition at any time point, we considered them to have that

condition in subsequent visits.

We assessed visual impairment using the Snellen test, and defined visual impairment as

corrected visual acuity <20/100.[23] We defined hearing impairment as self-reported difficulty

hearing.[24] To evaluate cognitive impairment, we used the Modified Mini-Mental State

Examination (3Ms). Those who scored below the 7th percentile (1.5 standard deviations below a

reference cohort mean) or were unable to complete the assessment were defined as cognitively

impaired.[25]

We asked participants about their ability to complete activities of daily living (ADLs).

We defined an ADL impairment as reporting difficulty with bathing, transferring, toileting,

dressing or eating.[26] We assessed lower extremity function with the Short Physical Performance

Battery (SPPB) test and classified those who scored ≤ 10 as having reduced physical

performance.[27] We assessed urinary incontinence in the past six months by asking participants

whether they had "leaked urine, even a small amount."[28]

We measured height and weight and calculated Body Mass Index (BMI), classifying a

BMI ≥ 18 to <25 as normal weight, 25 to <30 as overweight, and ≥ 30 as obese. We used the

Center for Epidemiological Studies Depression Scale (CES-D) to assess depressive symptoms; we considered scores ≥ 22 as indicating depressive symptoms.[29] We assessed pain by asking participants to score their average pain in the past week using a 10-point Likert scale. We categorized pain as mild (0-4); moderate (5-7) and severe (8-10).[30] We assessed whether participants used an assistive device—such as a cane, crutches, walker, wheelchair, or scooter— in the past six months.

Health-Related Behaviors

We classified smoking status using the California Tobacco Survey, categorizing participants as never, current, or former smokers.[31] We asked participants to report how much alcohol they drank and considered those who drank ≥ 6 drinks on one occasion monthly as heavy drinkers.[32] To assess illicit drug use (cocaine, amphetamines, opioids and marijuana) in the last six months, we used the World Health Organization's (WHO) Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST). We considered a score of ≥ 4 as indicative of moderate-to-severe use.[33]

Social and Environmental Risk Factors

Social Support

We used a validated measure of social support, counting the number of people in whom the participant could confide (0, 1-5, or ≥ 6).[34-36]

Physical Assault

To assess physical assault, we asked participants: "in the past six months, have you experienced physical violence by another person using an object like a gun or a knife, or did anyone ever slap, hit, punch, kick, choke, or burn you?"[37]

Residential Status

To assess exposure to environmental hazards at each visit, we used a residential follow-back calendar in which we asked participants to report each place they had stayed and number of nights in each setting during the prior six months.[38] We considered being unsheltered as indicative of the highest environmental exposure. We defined an unsheltered environment as sleeping outdoors or any place not meant for human habitation (e.g. transit terminal, abandoned building). We categorized participants as having spent any nights versus no nights in unsheltered settings.[16] In preliminary analyses, we evaluated nights unsheltered as a 3-level variable (0, 1-119, and 12-180 nights) and as a 6-level variable (0, 1-7, 8-30, 31-90, 91-120, and 121-180 nights). Neither alternative exhibited a dose-response effect. Therefore, we used a dichotomous measure of any nights unsheltered in our analysis.

Statistical Analyses

To identify risk factors for falls, we chose independent variables based on our hypotheses. We assessed bivariate associations between a priori independent variables and recent falls (i.e., one or more falls in the past 6 months) using generalized estimating equations (GEE).

We built our multivariable model by including variables with bivariate Type 1 p-values <0.20. If a categorical variable had more than two levels, we included all levels in our multivariable model if any Type 1 p-value was p<0.20. We reduced the model using backwards elimination retaining variables with p-values <0.05 in our final multivariable model. We conducted our analysis in SAS 9.4 using complete case analysis and robust confidence intervals (SAS Institute Inc., Cary, NC, USA, 2017).

In a sensitivity analysis, we assessed whether we had underestimated the probability of falls due to incomplete follow-up or mortality. We examined the prevalence of falls among

1   those: 1) with complete follow-up, 2) who had died during follow-up, or 3) who had not died but

2   had missed any study visits over the 36-month study period. We used GEE to examine whether

3   those who had died or missed visits were more likely to have experienced a fall in the past 6

4   months than those with complete follow-up.

5   We included participants with a minimum of two visits. We used weighted linear

6   regression with a second order polynomial and zero intercept term to plot a trend line.

7   RESULTS

8   *Participant Characteristics at Baseline*

9   The median age was 58.0 (IQR 54.0, 61.0). Of the 350 participants, the majority were men

10   (77.1%) and Bblack (79.7%). More than a quarter had less than a high school education (25.7%;

11   ). (Table 1). Over one-quarter were obese (26.6%). The majority of participants reported current

12   tobacco use (65.4%) and 11.2% reported heavy drinking. Almost one-fifth was cognitively

13   impaired (18.3%). The most prevalent substances with problematic use were cocaine (43.1%),

14   marijuana (39.1%), and opioids (12.9%). Approximately one-third of the cohort (32.5%)

15   reported not having any confidants; 10.1% experienced physical assault and 81.7% had spent a

16   night unsheltered.

17   *Fall Prevalence and Seeking Care for Falls*

18   At baseline, over one-third (33.7%) reported one or more falls in the past six months. (Table 1)

19   Of the 118 participants who reported falling at baseline, 28.0% reported 4 or more falls, 35.6%

20   two to three falls, and 36.4% one fall. One-third (33.1%) of participants who fell required

21   medical treatment due to a fall.

22   During the 36-month study, 28 participants died. Of those who survived, 183 completed

23   all six follow-up interviews; 72 completed 4-5, 32 completed 2-3, and 21 completed one follow-

up interview. We found a higher mean number of falls at baseline among those who died during follow-up (mean 0.42; standard deviation (SD) 0.50) and those who had not died but had missed visits (mean 0.38; SD 0.49) than among those who completed follow-up (mean 0.30; SD 0.46).

Of the 350 participants, 218 (62.3%) reported one or more falls in at least one study visit; 107 (30.6%) reported falls in at least half of the visits; and 34 (9.7%) reported falls at all visits.

Factors Associated with Falls

Those who reported falls at baseline had a higher prevalence of known risk factors for falls than those who had not fallen (Table 1). People with falls were significantly more likely to have less than a high school education, a history of stroke, difficulty with ADLs, mobility impairment, use of assistive device, increased urinary incontinence, and depressive symptoms. We found that those who fell were more likely to have moderate-to-high risk opioid and marijuana use, fewer social confidants, have spent at least one night unsheltered, or experienced physical assault.

In models adjusted for key covariates, individual risk factors associated with significantly higher odds of falls included older age (Adjusted Odds Ratio [AOR] 1.03, confidence interval (CI) 1.00-1.06), being a woman (AOR 1.45, 95% CI 1.02-2.04), having non-Black race (AOR 1.65, 95% CI 1.12-2.43), having a history of stroke (AOR 2.17, 95% CI 1.42-3.32), reporting an ADL impairment (AOR 1.99, 95% CI 1.51-2.63), urinary incontinence (AOR 1.40, 95% CI 1.07-1.81), and use of an assistive device (AOR 1.86, 95% CI 1.39-2.50) (Table 2).

Moderate-to-severe marijuana use (AOR 1.93, 95% CI 1.47-2.55) and moderate-to-severe opioid use (AOR 1.64, 95% CI 1.02-2.65) were associated with increased odds of falling. Experiencing physical assault (AOR 1.67, 95% CI 1.18-2.37) and spending any night unsheltered (AOR 1.42, 95% CI 1.10-1.83) in the last six months were as well.

1   In a sensitivity analysis, we found that those who had died during study follow-up (AOR

2   1.35, 95% CI 0.56-3.28) or who survived to study follow-up but had missed visits (AOR 1.24,

3   95% CI 0.89-1.72) were more likely to experience falls.

4   DISCUSSION

5   In this longitudinal study of adults 50 and older who were homeless at study enrollment,

6   we found a high prevalence of falls. Despite a median age of 58 years, study participants

7   reported a prevalence of falls higher than older adults with a mean age of 78 in the general

8   population.[3] Many participants fell repeatedly throughout the three-year study period; over a

9   third of the cohort reported falls in at least half of their study visits. We found an association

10   between falls and several factors known to increase fall risk within the general population,

11   including older age, gender, functional impairment, urinary incontinence, use of an assistive

12   device, and stroke.

13   Our findings indicate that the increased risk for falls in homeless older adults results, in

14   part, from a high prevalence of geriatric conditions (e.g. functional and urinary impairment) and

15   substance use (e.g. problematic opioid use) known to increase fall risk.[2] Some of these risk

16   factors may be modifiable via physical and occupational therapy, although it is more difficult to

17   intervene while someone is experiencing homelessness. As the average age of the homeless

18   population continues to increase, the population will have increasing prevalence of geriatric risk

19   factors.[39]

20   We identified novel risk factors: using marijuana, experiencing physical assault, and

21   spending time unsheltered that contributed to the high fall prevalence in our population. Both

22   opioid use and marijuana use were associated with increased odds of falling. Opioid use is

23   associated with increased fall risk among older adults in the general population.[40,41] However,

despite research on marijuana use and injuries in community-dwelling older adults, little is

known about how marijuana use impacts falls.[42-44] Marijuana—like opioids—may increase falls

by affecting the sensorium, inducing dizziness, confusion, and drowsiness.[42,45] We found a high

prevalence of marijuana use among study participants. People born in the study's age cohort

have had high prevalence of marijuana use their whole lives, including in older adulthood.[46-48] As

marijuana use among older adults increases, due to changes in legal status and cohort effects,

there may be increased falls associated with its use.

Experiencing physical assault is common among older adults who are homeless.[16]

Physical assault can increase fall risk directly (as a complication of assault), or indirectly, by

causing injuries that enhance underlying individual vulnerabilities associated with falls.[16] Future

research should evaluate the role of marijuana use and physical assault in falls among housed

older adults to determine whether these risk factors are unique to older adults experiencing

homelessness.

People who are unsheltered have increased exposure to unsafe environments, with

minimal control. They may stay in isolated locations with uneven surfaces and physical barriers,

such as abandoned buildings, under bridges, or along highways. Unsheltered environments lack

lighting or protection against environmental hazards. Avoiding falls requires intact executive

function and physical agility to be able to process external stimuli and modify movements to

remain upright.[49] For older adults with vulnerabilities—such as those common among homeless

older adults—small external triggers (e.g. rain, sidewalk debris, or uneven surfaces) may

precipitate falls. Housed older adults are able to modify their behaviors to avoid high-risk

environmental exposures that predispose them to falls. For example, they can decrease how often

they walk outside on uneven surfaces or minimize their public transit use. In contrast, adults

living in unsheltered settings have less ability to avoid high-risk environmental exposures.[50]

Our finding that non-Black race was associated with increased falls is consistent with

research in housed adults.[51,52] Homelessness is caused by an interaction between structural factors

and individual risk factors. Because Black Americans face structural racism, Black Americans

with less individual vulnerability (such as substance use and mental health disabilities) are at risk

for homelessness. While we adjusted for these conditions, there may be unmeasured confounders

that we were unable to account for.[1,53]

Limitations

Our study has several limitations. We rely on six-month recall of falls. Other studies of falls in

older adults use timeframes that range from monthly to biennial.[54,55] Participants without

complete study follow-up had a higher prevalence of falls, indicating that our model may have

underestimated the odds of experiencing falls. We did not ask about prescribed medications and

could not report on the role of polypharmacy. We conducted the study in the San Francisco Bay

Area, where 67% of people experiencing homelessness live unsheltered, compared to 5% in both

New York and Boston.[56] Studies in cities with lower proportions of unsheltered homelessness

may report lower rates of falls. Among individuals who are unsheltered, there are a wide variety

of environments that may affect fall risk. We did not have detailed data on the variety of

environments in which unsheltered homeless people stayed and cannot assess the risk of these

different exposures.

Conclusion

Older homeless adults have a high rate of falls, similar to those of adults 20 years older. The

increased risk is due to a high prevalence of individual risk factors and environmental exposures.

1 Identifying people at high risk for falls could allow targeted interventions, such as providing

2 shelter, low-height accessible beds, counseling on marijuana and opioid use, and physical

3 therapy. For older adults who live unsheltered, there are nascent efforts to have occupational

4 therapists visit unsheltered settings to reduce fall risk by employing reflective tape and anchoring

5 unstable environmental elements.[57,58] Finally, reducing unsheltered homelessness—either via

6 increased shelters or, ideally, increased long-term housing—could decrease the number of falls

7 in this high-risk population.

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Figure 1 Legend: HOPE HOME Sample Recruitment and Follow-up Sample Sizes.
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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42 **Table 1: Characteristics of homeless adults age 50 and older with and without falls**
43 **in the past 6 months at baseline interview (N = 350)**

Characteristics	Total (N=350)	Experienced falls in past 6 mo. (N=118)	No falls in past 6 mo. (N=232)	p-values
Individual risk factors				
Age, years median (Interquartile Range)	58.0 (54.0, 61.0)	58.0 (54.0, 62.0)	57.5 (54.0, 61.0)	0.57
Men, N (%)	270 (77.1)	87 (73.7)	183 (78.9)	0.28
Race/ethnicity, N (%)				0.11
Black	279 (79.7)	86 (72.9)	193 (83.2)	
White	38 (10.9)	18 (15.3)	20 (8.6)	
Hispanic	16 (4.6)	8 (6.8)	8 (3.4)	
Other	17 (4.9)	6 (5.1)	11 (4.7)	
Less than high school diploma/ General Education Development (GED), N (%)	90 (25.7)	37 (31.4)	53 (22.8)	0.09
Health status				
Myocardial infarction	32 (9.1)	15 (12.7)	17 (7.3)	0.10

Congestive heart failure	25 (7.1)	8 (6.8)	17 (7.3)	0.85
Stroke	39 (11.2)	25 (21.4)	14 (6.0)	<0.0001
Arthritis	156 (44.6)	59 (50.0)	97 (41.8)	0.15
Diabetes	50 (14.3)	18 (15.3)	32 (13.9)	0.72
Chronic lung disease	94 (26.9)	39 (33.1)	55 (23.7)	0.06
Visual impairment[*]	53 (15.9)	19 (17.1)	34 (15.2)	0.66
Hearing impairment	124 (35.6)	49 (41.9)	75 (32.5)	0.08
Cognitive impairment (3MS)[†]	64 (18.3)	20 (17.1)	44 (19.0)	0.67
≥ 1 ADL impairments[‡]	136 (38.9)	66 (55.9)	70 (30.2)	<0.0001
Physical performance - SPBB ≤ 10[§]	201 (58.4)	84 (73.0)	117 (51.1)	<0.0001
Urinary incontinence	167 (48.0)	71 (61.2)	96 (41.4)	0.0005
Body Mass Index, N (%)				
<25	149 (43.6)	52 (47.3)	97 (41.8)	0.56
25 to <30	102 (29.8)	29 (26.4)	73 (31.5)	
>=30	91 (26.6)	29 (26.4)	62 (26.7)	
Depressive symptoms; CES-D ≥ 22, N (%) [‖]	133 (38.3)	55 (46.6)	78 (34.1)	0.02
Pain severity				
Mild	151 (43.4)	43 (36.8)	108 (46.8)	0.11
Moderate	60 (17.2)	19 (16.2)	41 (17.7)	
Severe	137 (39.4)	55 (47.0)	82 (35.5)	
Assistive device	102 (29.1)	50 (42.4)	52 (22.4)	0.0001
Health-related behaviors				
Smoking Status, N (%)				
Non smoker	78 (22.3)	59 (25.4)	19 (16.1)	0.10
Current smoker	229 (65.4)	148 (63.8)	81 (68.6)	
Former smoker	43 (12.3)	25 (10.8)	18 (15.3)	
Heavy drinking[¶]	39 (11.2)	13 (11.1)	26 (11.3)	0.97
Cocaine[#]	151 (43.1)	57 (48.3)	94 (40.5)	0.16
Amphetamines	28 (8.0)	10 (8.5)	18 (7.8)	0.82
Opioids	45 (12.9)	22 (18.6)	23 (9.9)	0.02
Marijuana	137 (39.1)	58 (49.2)	79 (34.1)	0.006
Environmental risk factors, N(%)				
Social Support, N (%)				
0 confidants	113 (32.5)	38 (32.8)	75 (32.3)	0.02
1-5 confidants	205 (58.9)	75 (64.7)	130 (56.0)	

6+ confidants	30 (8.6)	3 (2.6)	27 (11.6)	
Physical assault, past 6 months	35 (10.1)	19 (16.2)	16 (7.0)	0.007
Any nights spent in unsheltered settings, past 6 months	286 (81.7)	101 (85.6)	185 (79.7)	0.18

1   * Visual acuity <20/100 using the Snellen test.
2   † Cognitive impairment defined as a Modified Mini-Mental State Examination score < 7th percentile (i.e. 1.5
3   standard deviations below the demographically-adjusted cohort mean).
4   ‡ ADL = activities of daily living.
5   § Short Physical Performance Battery (SPPB) test.
6   ‖ CES-D = Center for Epidemiological Studies Depression Scale.
7   ¶ ≥ 6 drinks on one occasion ≥ once monthly.
8   # Moderate-to-severe illicit drug use past 6 months defined as a World Health Organization Alcohol,
9   Smoking and Substance Involvement Screening Test score for cocaine, amphetamines, opioids, marijuana
10   with score of ≥ 4.
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1   **Table 2: Odds of Experiencing Falls in the past 6 months over 3-Years in GEE Model**

2   **Among Adults ≥ 50 years Who Were Homeless at Baseline 2013-2014**

1   [*] Only bivariate variables with any Type 1 p-values p<.20 are shown and were entered in the starting multivariate
2   model.
3   [†] GED = General Education Development.

Variables	Unadjusted odds ratio (OR) (95% CI)[*]	Adjusted odds ratio (AOR) (95% CI)
Individual risk factors		
Age, (continuous years)	1.03 (1.00-1.05)	1.03 (1.00-1.06)
Women	1.59 (1.11-2.27)	1.45 (1.02-2.04)
Non-black	1.68 (1.15-2.45)	1.65 (1.12-2.43)
< High school diploma/GED[†]	1.37 (0.94-2.01)	--
Health status		
Myocardial infarction	2.15 (1.30-3.57)	--
Congestive heart failure	1.70 (0.98-2.94)	--
Stroke	3.36 (2.07-5.47)	2.17 (1.42-3.32)
Arthritis	1.44 (1.04-2.00)	--
Diabetes	0.74 (0.49-1.10)	--
Chronic lung disease	1.61 (1.16-2.24)	--
Hearing impairment	1.49 (1.07-2.08)	--
≥ 1 ADL impairments[‡]	3.06 (2.34-3.99)	1.99 (1.51-2.63)
Short Physical Performance Battery score ≤ 10	1.82 (1.29-2.56)	--
Urinary incontinence	2.23 (1.71-2.91)	1.40 (1.07-1.81)
Depressive symptoms (CES-D ≥ 22)[§]	1.73 (1.31-2.28)	--
Pain severity		
Moderate	1.74 (1.26-2.40)	
Severe	2.51 (1.83-3.44)	
Assistive device	2.81 (2.11-3.75)	1.86 (1.39-2.50)
Health-related behaviors		
Current smoker	1.30 (0.96-1.77)	
Heavy drinking[‖]	1.63 (1.08-2.47)	--
Cocaine[¶]	1.36 (1.00-1.86)	--
Opioids	2.13 (1.35-3.36)	1.64 (1.02-2.65)
Marijuana	1.85 (1.40-2.42)	1.93 (1.47-2.55)
Environmental risk factors		
Social support		
1-5 confidants	1.11 (0.84-1.46)	--
≥ 6 confidants	0.65 (0.36-1.15)	--
Physical assault, past 6 months	2.28 (1.65-3.17)	1.67 (1.18-2.37)
Any nights spent in unsheltered settings, past 6 months	1.49 (1.16-1.91)	1.42 (1.10-1.83)

‡ ADL = Activities of Daily Living.
§ CES-D = Center for Epidemiological Studies Depression Scale.
‖ ≥ 6 drinks on one occasion ≥ once monthly.
¶ Moderate-to-severe illicit drug use past 6 months defined as a World Health Organization Alcohol, Smoking and Substance Involvement Screening Test score for cocaine, amphetamines, opioids, marijuana with score of ≥ 4.