Childhood adversities associated with poor adult mental health outcomes in older homeless adults: Results from the HOPE HOME study

Chuan Mei Lee, MD, MA[1], **Christina Mangurian, MD, MAS**[1,2], **Lina Tieu, MPH**[2,3], **Claudia Ponath, MA**[3], **David Guzman, MSPH**[2,3], and **Margot Kushel, MD**[2,3]

[1]Department of Psychiatry, University of California, San Francisco

[2]Center for Vulnerable Populations at San Francisco General Hospital and Trauma Center, University of California, San Francisco

[3]Division of General Internal Medicine, University of California, San Francisco/San Francisco General Hospital and Trauma Center

Abstract

Objective—To examine whether childhood adversity is associated with depressive symptoms, suicide attempts, or psychiatric hospitalization.

Design—History of seven childhood adversities (physical neglect, verbal abuse, physical abuse, sexual abuse, parental death, parental incarceration, and child welfare system placement) was gathered through in-person interviews. Multivariate models examined associations between history of childhood adversities and moderate to severe depressive symptoms, lifetime history of suicide attempt, or lifetime history of psychiatric hospitalization.

Setting—General community.

Participants—The study enrolled 350 homeless adults, aged 50 and older, in Oakland, CA using population-based sampling methods.

Measurements—Moderate to severe depressive symptoms measured on a Center for Epidemiologic Studies–Depression Scale (CES-D ≥ 22), self-reported lifetime history of suicide attempt, and self-reported lifetime history of psychiatric hospitalization.

Results—Participants with exposure to one childhood adversity had elevated odds of reporting moderate to severe depressive symptoms (adjusted odds ratio [AOR] 2.0; 95% confidence interval [CI] 1.1–3.7) and lifetime history of suicide attempt (AOR 4.6; 95% CI 1.0–21.6) when compared to those who had none; the odds of these two outcomes increased with exposure to additional childhood adversities. Participants with four or more childhood adversities had higher odds of having a lifetime history of psychiatric hospitalization (AOR 7.1; 95% CI 2.8–18.0); there was no increase with fewer adversities.

Conclusion—Childhood adversities are associated with poor mental health outcomes among older homeless adults. Clinicians should collect information about childhood adversities among this high-risk population to inform risk assessment and treatment recommendations.

INTRODUCTION

Homelessness affects 2.5–3.5 million people in the United States annually.[1] The homeless population is aging; the median age of homeless adults is over 50, compared to 37 in the early 1990s.[2] Due to poor health, homeless adults are considered older at age 50.[3,4] Studies on older homeless populations show high rates of psychiatric morbidity, including depressive symptoms, psychiatric hospitalization, and alcohol use disorders.[5] Despite the high prevalence of mental health problems, there is limited research on predictors of psychiatric morbidity among older homeless adults.

A growing body of research links childhood adversity (e.g., child maltreatment, caregiver loss, or out-of-home experiences) with poor mental and physical health outcomes in adulthood.[6,7] The Adverse Childhood Experiences (ACE) study, an investigation of adults receiving primary care in a health maintenance organization, found a dose-response relationship between cumulative adverse childhood experiences and poor mental health outcomes, including depression, substance use, and attempted suicide.[6,8–11] Studies in the general population have found associations between childhood adversities and poor mental health outcomes in old age.[12,13] Long-term longitudinal studies have found that childhood adversity is associated with adult psychopathology.[14,15]

Childhood adversity is associated with an increased risk of adult homelessness potentially caused by disruptions in social bond formation, decreased familial ties, and limitations in educational options and job attainment.[16,17] Although childhood adversity has been associated with worse psychiatric outcomes among a sample of homeless women under age 50[18] and among homeless adults with mental illness,[19] little is known about the prevalence

of and association between childhood adversity and psychiatric morbidity among older homeless adults. Understanding the relationships between childhood adversity and psychiatric morbidities in this population could guide risk stratification and allow for clinical and training guidelines.

In a sample of older homeless adults, we assessed the association between childhood adversities and current and lifetime psychiatric problems. We hypothesized that childhood adversity would be associated with moderate to severe depressive symptoms, lifetime history of suicide attempt, and lifetime history of psychiatric hospitalization. We hypothesized that alcohol or drug use mediates the association between childhood adversity and moderate to severe depressive symptoms.

METHODS

Participants and Procedures

The Health Outcomes of People Experiencing Homelessness in Older Middle Age (HOPE HOME) study recruited homeless adults (age 50) in Oakland, CA from all shelters serving adults over age 25 (n=5), all free and low-cost meal programs serving at least three meals per week (n=5), a recycling center (n=1), and randomly selected encampments and outdoor sites where homeless individuals stayed, using population-based sampling methods adapted from our prior work.[20] Based on the estimates of the number of unique individuals who used the site annually, we approached potential study participants in a random order and assessed for interest and preliminary eligibility. We invited those who were interested and preliminarily eligible for an enrollment interview at a community-based field site. At the enrollment visit, we conducted an in-depth review of eligibility and offered enrollment to eligible individuals.

We conducted baseline interviews from July 2013 through June 2014. To be included, participants had to be age 50 or older, English-speaking, and homeless as defined by the Homeless Emergency Assistance and Rapid Transition to Housing (HEARTH) Act.[21] We excluded participants if they could not give informed consent, as determined by a teach-back method.[22] Trained interviewers conducted in-depth, structured baseline interviews with eligible study participants. Participants received a $5 gift card after completing the enrollment procedures and received a $20 gift card after completing the enrollment interview. The University of California, San Francisco (UCSF) Committee on Human Research approved all study procedures.

Sociodemographic Characteristics

Sociodemographic characteristics included self-reported age, sex, race/ethnicity (African American, white, Hispanic/Latino, Asian American, or mixed/other and dichotomized as African American versus non-African American), education level (dichotomized as high school graduate or above versus having passed the General Education Development (GED®) test or less), and relationship status (never married nor partnered in a "marriage-like relationship," separated/divorced, widowed, or married/partnered). We gauged history of military service by asking participants if they had ever been on active duty military service

in the armed forces or served in the U.S. military reserves or National Guard.[23] We asked participants to report the age they experienced their first episode of adult homelessness. We asked about lifetime homelessness and tallied the cumulative duration of adult homelessness since age 18. We asked participants if they ever used alcohol regularly (used enough to have felt the effects three or more times per week). We asked participants if they ever used illicit drugs regularly (used cannabis, cocaine, amphetamine-type stimulants, inhalants, sedatives, hallucinogens, or non-prescribed opioids, three or more times per week).[23]

Health and Functional Status

Using questions from the National Health and Nutrition Examination Survey (NHANES), we asked participants to report if a health care provider had ever told them that they had hypertension, coronary artery disease or myocardial infarction, congestive heart failure, diabetes, stroke, chronic obstructive pulmonary disease or asthma, cancer, or HIV/AIDS.[24] We categorized responses as zero, one, two, or three or more of these chronic medical conditions. We used the Katz Index of Independence in Activities of Daily Living (ADLs) to assess ADL difficulties, defined as difficulty completing individual ADLs (bathing, dressing, eating, transferring, or toileting) due to a physical, mental, emotional, or memory problem.[25] We categorized the number of ADL difficulties as zero, one, or two or more. We used the Brief Instrumental Functioning Scale (BIFS) to assess difficulties in performing individual instrumental activities of daily living (IADLs) (taking transportation, managing medications, managing money, applying for benefits, setting up job interviews, or finding a lawyer)[26] and categorized the number of difficulties as zero, one, or two or more. We determined cognitive status using the Modified Mini-Mental State Examination.[27] We defined cognitive impairment as a score below the 7th percentile (i.e. 1.5 standard deviations below the mean of a reference cohort).[27,28]

Childhood Adversities

We asked participants whether or not they had the following experiences before age 18: 1) physical neglect ("*From the time you were a baby until you were 18 years old, did anyone you lived with ever leave you without adequate food or shelter?*"), 2) verbal abuse ("*Did anyone ever call you names, threaten you, swear at you, or make you feel stupid or worthless?*"), 3) physical abuse ("*Did you ever experience 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?*"), 4) sexual abuse ("*Has anyone ever pressured or forced you to have sexual contact, defined as touching your private parts in a sexual way, making you do something sexual, or making you have sex?*"), 5) death of either parent, 6) incarceration of either parent for one month or more, and 7) placement in the child welfare system. The questions regarding physical neglect, parental death, parental incarceration, and child welfare system placement were adapted from the National Survey of Homeless Assistance Providers and Clients (NSHAPC).[23] The questions regarding verbal, physical, and sexual abuse were adapted from a prior study of childhood abuse among homeless women.[29] The questions pertaining to physical neglect, verbal abuse, physical abuse, sexual abuse, and parental incarceration were similar to ACE study items about childhood adversity (Supplementary Table 1).[6] We adapted a method used in the ACE study[6] to create a cumulative "childhood adversity" variable that is the summation score of each of these seven categories weighted

equally (range 0–7). Because of the low prevalence of scores of five or greater, we grouped study participants with four or more childhood adversities together.

Dependent Variables: Adult Psychiatric Morbidity

Our primary dependent variables were moderate to severe depressive symptoms, lifetime history of suicide attempt, and lifetime history of psychiatric hospitalization. We used the Center for Epidemiologic Studies Depression Scale (CES-D) to assess for depressive symptomatology in the prior week,[30] shown to be a reliable measure in homeless populations.[31] We used a CES-D score of 22 to define moderate to severe depressive symptoms[32] to ensure specificity for depressive disorders. We asked participants to self-report lifetime histories of suicide attempt and psychiatric hospitalization, both dichotomized as ever versus never.

Statistical Analyses

We used Pearson chi-square and Wilcoxon non-parametric tests to examine demographic differences between study participants with and without any history of childhood adversity. We used logistic regression to measure the association between childhood adversity and psychiatric morbidity, controlling for variables shown to influence both risk of childhood trauma and depression (age, sex, race/ethnicity, and education level).[33,34] We included each of these variables in the initial multivariate models, which we reduced using backward elimination until only variables with p-values of 0.05 or lower remained.

After multivariate analysis, we evaluated whether the association between childhood adversity and moderate to severe depression symptoms was mediated by the regular use of alcohol or illicit drug use during young or middle adulthood (age 18–49). For each substance, we compared the bivariate logistic model with the cumulative childhood adversity score as the only independent variable with a model also including use of that substance as an independent variable. We used SAS version 9.4 (SAS Institute, Inc.) to perform all analyses.

RESULTS

Sampling

We scheduled 536 people who met basic eligibility criteria for interviews; of the 361 who attended the screening interview, we interviewed 350 who met full criteria and agreed to enrollment (Figure 1).

Sociodemographic Characteristics

The mean age was 58.1 (SD 5.2) years. Over three-quarters (77.1%) were men, and 79.7% were African American. Overall, 68.6% had graduated from high school, 41.4% never married nor partnered and 21.7% served in the military. Almost half (43.4%) experienced their first episode of adult homelessness at age 50 or later. The median total duration of adult homelessness since age 18 was 2.5 years (interquartile range of 0.7–8.0 years). Over half reported a lifetime history of regular alcohol use (61.9%), cannabis use (62.4%), or cocaine use (51.7%) (Table 1).

Health and Functional Status

One-third (33.4%) of participants reported having one chronic medical condition, 28.9% reported two, and 12.3% reported three or more. Over one-third (38.9%) of participants had difficulty performing at least one ADL. Almost half (49.4%) of participants had difficulty performing at least one IADL. A quarter (25.8%) met criteria for cognitive impairment. (Table 1).

Childhood Adversities

The most commonly reported childhood adversities were verbal abuse (49.3%), physical abuse (33.3%), and parental death (21.4%); the least common was parental incarceration (5.5%). Overall, 71.7% of participants reported at least one childhood adversity, and 8.3% reported four or more. Of those who stated only one childhood adversity (32.6%, n=114), the most frequently reported categories were verbal abuse (49.1%), parental death (25.4%), and physical abuse (17.5%). Of those who reported four or more items of childhood adversity (8.3%, n=29), the most common categories were verbal abuse (100%), physical abuse (93.1%), and sexual abuse (75.9%) (Table 2).

Adult Psychiatric Morbidity

Over a third of participants (38.3%) scored 22 or higher on the CES-D, indicating moderate to severe depressive symptoms. In a multivariate model for moderate to severe depressive symptoms, only age and adverse childhood experiences remained in the model. The adjusted odds ratio (AOR) of adverse experiences exhibited a dose-response relationship, with increasing odds of moderate to severe depressive symptoms with each increase in the level of adversity. Those with exposure to one childhood adversity had a two-fold increase in odds of reporting moderate to severe depressive symptoms (AOR 2.0; 95% CI 1.1–3.7), while those with exposure to four or more childhood adversities had a six-fold increase (AOR 6.0; 95% CI 2.4–15.4), compared to those with no adverse events (Table 3). In our evaluation of mediation of current depressive symptoms by substance use, the OR for cocaine use among those with a trauma score of 4+ versus 0, increased from 7.7 to 9.0 (17%). The remaining ORs changed from +7.6% to −11.0%.

Of the participants, 13.0% reported a lifetime history of suicide attempt. In multivariate analysis, the odds of reporting a suicide attempt exhibited a dose-response relationship. Those with exposure to one childhood adversity had a non-significantly elevated odds of having a suicide attempt (AOR 4.6; 95% CI 1.0–21.6). Those with exposure to four or more childhood adversities had a 45-fold increase (AOR 44.7; 95% CI 9.1–219.2), compared to those with no adversities. (Table 3)

Almost a fifth (18.9%) of participants reported a lifetime history of psychiatric hospitalization. In a multivariate model having exposures to one, two or three types of childhood adversity was not associated with having had a psychiatric hospitalization. However, having exposure to four or more childhood adversities was significantly associated (AOR 7.1; 95% CI 2.8–18.0). (Table 3).

DISCUSSION

In this sample of older homeless adults, we found a high prevalence of childhood adversity when compared to the general population.[35] Our findings advance prior research by demonstrating that older homeless adults have a similarly high prevalence of childhood adversity as do younger homeless populations.[36] As in the general population, we found a dose-response association between childhood adversities and psychiatric morbidities, despite the high prevalence of both childhood adversities and psychiatric morbidities.

The prevalence of childhood physical abuse was higher in this sample than in the general population (33.3% versus 14.8%),[35] but was comparable to a national sample of younger homeless adults.[23] We found a high prevalence of parental death occurring during the participants' childhood when compared to the general population (21.4% versus 0.3%).[37] Early parental death may have repercussions on subsequent development, given the psychological and financial impact on the family system.

Childhood adversity is a known risk factor for homelessness,[17] but has not been explored in older homeless adults. Despite the fact that over 40% of the participants in our study first experienced homelessness at age 50 or later, the high prevalence of childhood adversity suggests the lingering effects of adverse childhood events, which can cause homelessness through a variety of mechanisms.[38,39] Childhood adversity disrupts the formation of social bonds and is associated with decreased familial social support.[40] These disruptions create vulnerabilities to homelessness throughout the life course by limiting educational and employment options, increasing risk for criminal justice system involvement and later life victimization, and decreasing the likelihood of forming marital bonds. These may cause homelessness directly by creating barriers to employment and housing or indirectly by decreasing the ability for an individual to withstand income shocks, lack of affordable housing, or health crises through familial support.[39]

Participants had a high prevalence of psychiatric morbidity consistent with the literature on younger homeless adults.[41] The relationship between mental health problems and homelessness is complex and bi-directional.[42] Mental illness and psychiatric hospitalizations are presumed to have direct effects on homelessness, via decreased opportunities for educational attainment and employment and decreased formation of social ties.[38,39] Homelessness is a risk factor for the development and worsening of mental health problems, due to the stress of homelessness, disruption of social ties, and poor access to mental health care.[39]

We found an independent, dose-response relationship between exposure to childhood adversity and both moderate to severe depressive symptoms and lifetime history of suicide attempt, consistent with the ACE literature.[8,11] Exposure to childhood adversity was associated independently with a lifetime history of psychiatric hospitalization, but only for individuals with four or more adversities. We hypothesized that the association between childhood adversities and depressive symptoms would be mediated by substance use in adulthood, but we did not find evidence of this, which may be a function of the high prevalence of substance use in our study population. These findings suggest that, even at

older ages, childhood adversity contributes to psychiatric morbidity in this high-risk population.

The association between exposure to childhood adversity and psychiatric morbidity has implications for clinical practice and training. Although the Substance Abuse and Mental Health Services Administration (SAMHSA) recommends that providers screen for physical and sexual trauma in all patients[43] because of the strong evidence of the influence this trauma has on future psychiatric morbidity,[44] there is no such recommendation to screen for parental loss. Our findings suggest that mental health and primary care providers should consider screening older homeless adults for all childhood adversities. This may enhance suicide risk assessment by identifying those with multiple adversities, who are at highest risk.

Older homeless adults have a high rate of medical complexity, including high rates of chronic diseases and geriatric conditions.[3] The high prevalence of cognitive impairment in this population could be due to dementia, depression, or acute substance use. Their functional status is worse than those 20 years older in the general population.[4] This burden of chronic medical conditions, cognitive impairment, and poor functional status in our study population has implications for mental health treatment. For instance, individuals with multiple co-morbid medical and psychiatric issues, as well as poor functional status and cognitive impairment may have a challenging time managing multiple health care visits and may be at risk for the negative health effects of polypharmacy. Individuals with cognitive impairment may not be able to benefit from traditional psychotherapies. Current interventions aimed at housed geriatric populations, such as home visits from psychiatric teams, may be more challenging to implement among homeless older populations.

There is a high prevalence of housing stress among individuals age 50 and older, which may reflect lack of affordable housing in the context of fixed or shrinking incomes.[45] As an increasing proportion of adults 50 and older are at risk for homelessness, due to a birth-cohort effect, and a mismatch between fixed incomes and a lack of affordable housing for older Americans, psychiatrists working with low-income, older populations should screen for homelessness. The high prevalence of psychiatric morbidity in this medically complex population presents challenges to the mental health workforce amidst a shortage of geriatric psychiatrists.[46]

Limitations

Our study has several limitations. We cannot compare the rates of adversity we measured directly with studies that used the ACE score.[6] We employed validated measures used in other studies of homeless populations, including the nationally representative study of homeless individuals.[23] Second, we used a cross-sectional design, so we are unable to draw causal inferences about the association between childhood adversity and psychiatric morbidity. Third, as in other studies examining childhood adversity,[6,35] our estimates of childhood adversity may be underreported. Finally, we did not use measures to diagnose clinical depression, but we did use a validated instrument to detect depressive symptoms that allowed for comparison to other studies.[30,31]

Conclusion

Childhood adversity is prevalent and has enduring effects on psychiatric morbidity among a sample of older homeless adults. Interventions to reduce or ameliorate childhood adversity may have an impact on homelessness throughout the life course. The high rates of moderate to severe depressive symptoms, lifetime history of psychiatric hospitalization and suicide attempt suggest an ongoing risk for suicide in this population. Screening for childhood adversity may enhance suicide risk assessment among older depressed homeless adults. The range of childhood adversity and the cumulative risk suggest that screens should include a range of adverse experiences to gauge risk. Given the shortage of geriatric mental health providers, screening for childhood adversities should be undertaken by all providers who care for older homeless adults.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

References

1. Fazel S, Geddes JR, Kushel M. The health of homeless people in high-income countries: descriptive epidemiology, health consequences, and clinical and policy recommendations. Lancet. Oct; 2014 384(9953):1529–1540. [PubMed: 25390578]

2. Hahn JA, Kushel MB, Bangsberg DR, Riley E, Moss AR. BRIEF REPORT: the aging of the homeless population: fourteen-year trends in San Francisco. J Gen Intern Med. Jul; 2006 21(7):775–778. [PubMed: 16808781]

3. Brown RT, Hemati K, Riley ED, et al. Geriatric Conditions in a Population-Based Sample of Older Homeless Adults. Gerontologist. Feb.2016

4. Brown RT, Kiely DK, Bharel M, Mitchell SL. Geriatric syndromes in older homeless adults. J Gen Intern Med. Jan; 2012 27(1):16–22. [PubMed: 21879368]

5. Stergiopoulos V, Herrmann N. Old and homeless: a review and survey of older adults who use shelters in an urban setting. Can J Psychiatry. Jul; 2003 48(6):374–380. [PubMed: 12894611]

6. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. Am J Prev Med. May; 1998 14(4):245–258. [PubMed: 9635069]

7. McLaughlin KA, Green JG, Gruber MJ, Sampson NA, Zaslavsky AM, Kessler RC. Childhood adversities and adult psychiatric disorders in the national comorbidity survey replication II: associations with persistence of DSM-IV disorders. Arch Gen Psychiatry. Feb; 2010 67(2):124–132. [PubMed: 20124112]

8. Chapman DP, Whitfield CL, Felitti VJ, Dube SR, Edwards VJ, Anda RF. Adverse childhood experiences and the risk of depressive disorders in adulthood. J Affect Disord. Oct; 2004 82(2):217–225. [PubMed: 15488250]

9. Dube SR, Anda RF, Felitti VJ, Edwards VJ, Croft JB. Adverse childhood experiences and personal alcohol abuse as an adult. Addict Behav 2002. Sep-Oct;2002 27(5):713–725.

10. Dube SR, Felitti VJ, Dong M, Chapman DP, Giles WH, Anda RF. Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: the adverse childhood experiences study. Pediatrics. Mar; 2003 111(3):564–572. [PubMed: 12612237]

11. Dube SR, Anda RF, Felitti VJ, Chapman DP, Williamson DF, Giles WH. Childhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span: findings from the Adverse Childhood Experiences Study. JAMA. Dec; 2001 286(24):3089–3096. [PubMed: 11754674]

12. Raposo SM, Mackenzie CS, Henriksen CA, Afifi TO. Time does not heal all wounds: older adults who experienced childhood adversities have higher odds of mood, anxiety, and personality disorders. Am J Geriatr Psychiatry. Nov; 2014 22(11):1241–1250. [PubMed: 24012227]

13. Ege MA, Messias E, Thapa PB, Krain LP. Adverse childhood experiences and geriatric depression: results from the 2010 BRFSS. Am J Geriatr Psychiatry. Jan; 2015 23(1):110–114. [PubMed: 25306195]

14. McLaughlin KA, Kubzansky LD, Dunn EC, Waldinger R, Vaillant G, Koenen KC. Childhood social environment, emotional reactivity to stress, and mood and anxiety disorders across the life course. Depress Anxiety. Dec; 2010 27(12):1087–1094. [PubMed: 21132844]

15. Clark C, Caldwell T, Power C, Stansfeld SA. Does the influence of childhood adversity on psychopathology persist across the lifecourse? A 45-year prospective epidemiologic study. Ann Epidemiol. May; 2010 20(5):385–394. [PubMed: 20382340]

16. Roos LE, Mota N, Afifi TO, Katz LY, Distasio J, Sareen J. Relationship between adverse childhood experiences and homelessness and the impact of axis I and II disorders. Am J Public Health. Dec; 2013 103(Suppl 2):S275–281. [PubMed: 24148049]

17. Koegel P, Melamid E, Burnam A. Childhood risk factors for homelessness among homeless adults. Am J Public Health. Dec; 1995 85(12):1642–1649. [PubMed: 7503338]

18. Stein JA, Leslie MB, Nyamathi A. Relative contributions of parent substance use and childhood maltreatment to chronic homelessness, depression, and substance abuse problems among homeless women: mediating roles of self-esteem and abuse in adulthood. Child Abuse Negl. Oct; 2002 26(10):1011–1027. [PubMed: 12398858]

19. Patterson ML, Moniruzzaman A, Somers JM. Setting the stage for chronic health problems: cumulative childhood adversity among homeless adults with mental illness in Vancouver, British Columbia. BMC Public Health. 2014; 14:350. [PubMed: 24726046]

20. Weiser SD, Hatcher A, Frongillo EA, et al. Food insecurity is associated with greater acute care utilization among HIV-infected homeless and marginally housed individuals in San Francisco. J Gen Intern Med. Jan; 2013 28(1):91–98. [PubMed: 22903407]

21. Shelton KH, Taylor PJ, Bonner A, van den Bree M. Risk factors for homelessness: evidence from a population-based study. Psychiatr Serv. Apr; 2009 60(4):465–472. [PubMed: 19339321]

22. Sudore RL, Landefeld CS, Williams BA, Barnes DE, Lindquist K, Schillinger D. Use of a modified informed consent process among vulnerable patients: a descriptive study. J Gen Intern Med. Aug; 2006 21(8):867–873. [PubMed: 16881949]

23. Burt, MR. United States. Interagency Council on the Homeless., Urban Institute. Homelessness: programs and the people they serve: findings of the National Survey of Homeless Assistance Providers and Clients: summary. Washington, DC: U.S. Dept. of Housing and Urban Development; 1999.

24. National Health and Nutrition Examination Survey Questionnaire (NHANES). Hyattsville, MD: Centers for Disease Control and Prevention; 2013.

25. Katz S. Assessing self-maintenance: activities of daily living, mobility, and instrumental activities of daily living. J Am Geriatr Soc. Dec; 1983 31(12):721–727. [PubMed: 6418786]

26. Sullivan G, Dumenci L, Burnam A, Koegel P. Validation of the brief instrumental functioning scale in a homeless population. Psychiatr Serv. Aug; 2001 52(8):1097–1099. [PubMed: 11474058]

27. Bland RC, Newman SC. Mild dementia or cognitive impairment: the Modified Mini-Mental State examination (3MS) as a screen for dementia. Can J Psychiatry. Aug; 2001 46(6):506–510. [PubMed: 11526806]

28. Bravo G, Hébert R. Age- and education-specific reference values for the Mini-Mental and modified Mini-Mental State Examinations derived from a non-demented elderly population. Int J Geriatr Psychiatry. Oct; 1997 12(10):1008–1018. [PubMed: 9395933]

29. Green HD Jr, Tucker JS, Wenzel SL, et al. Association of childhood abuse with homeless women's social networks. Child Abuse Negl. Jan; 2012 36(1):21–31. [PubMed: 22265902]

30. Radloff L. The CES-D scale: a self-report depression scale for research in the general population. Applied Psychological Measurement. 1977:385–401.

31. Ritchey FJ, La Gory M, Fitzpatrick KM, Mullis J. A comparison of homeless, community-wide, and selected distressed samples on the CES-Depression Scale. Am J Public Health. Nov; 1990 80(11):1384–1386. [PubMed: 2240314]

32. Haringsma R, Engels GI, Beekman AT, Spinhoven P. The criterion validity of the Center for Epidemiological Studies Depression Scale (CES-D) in a sample of self-referred elders with depressive symptomatology. International journal of geriatric psychiatry. Jun; 2004 19(6):558–563. [PubMed: 15211536]

33. Cole MG, Dendukuri N. Risk factors for depression among elderly community subjects: a systematic review and meta-analysis. Am J Psychiatry. Jun; 2003 160(6):1147–1156. [PubMed: 12777274]

34. González HM, Tarraf W, Whitfield KE, Vega WA. The epidemiology of major depression and ethnicity in the United States. J Psychiatr Res. Nov; 2010 44(15):1043–1051. [PubMed: 20537350]

35. Adverse childhood experiences reported by adults --- five states, 2009. MMWR Morb Mortal Wkly Rep. 2010; 59(49):1609–1613. [PubMed: 21160456]

36. Tam TW, Zlotnick C, Robertson MJ. Longitudinal perspective: adverse childhood events, substance use, and labor force participation among homeless adults. Am J Drug Alcohol Abuse. 2003; 29(4): 829–846. [PubMed: 14713142]

37. Slopen N, Shonkoff JP, Albert MA, et al. Racial Disparities in Child Adversity in the U.S.: Interactions With Family Immigration History and Income. Am J Prev Med. Sep.2015

38. Craig TK, Hodson S. Homeless youth in London: I. Childhood antecedents and psychiatric disorder. Psychol Med. Nov; 1998 28(6):1379–1388. [PubMed: 9854279]

39. Tsai J, Edens EL, Rosenheck RA. A typology of childhood problems among chronically homeless adults and its association with housing and clinical outcomes. J Health Care Poor Underserved. Aug; 2011 22(3):853–870. [PubMed: 21841283]

40. Kendall-Tackett K. The health effects of childhood abuse: four pathways by which abuse can influence health. Child Abuse Negl. Jun; 2002 26(6–7):715–729. [PubMed: 12201164]

41. DeMallie DA, North CS, Smith EM. Psychiatric disorders among the homeless: a comparison of older and younger groups. Gerontologist. Feb; 1997 37(1):61–66. [PubMed: 9046707]

42. Cohen CI, Thompson KS. Homeless mentally ill or mentally ill homeless? Am J Psychiatry. Jun; 1992 149(6):816–823. [PubMed: 1590500]

43. Trauma-Informed Care in Behavioral Health Services. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014.

44. Yehuda R, Halligan SL, Grossman R. Childhood trauma and risk for PTSD: relationship to intergenerational effects of trauma, parental PTSD, and cortisol excretion. Dev Psychopathol. 2001; 13(3):733–753. [PubMed: 11523857]

45. Baker, K., Baldwin, P., Donahue, K., et al. Housing America's Older Adults: Meetings the Needs of an Aging Population. Cambridge, MA: Joint Center for Housing Studies of Harvard University; 2014.

46. Bartels SJ, Naslund JA. The underside of the silver tsunami--older adults and mental health care. N Engl J Med. Feb; 2013 368(6):493–496. [PubMed: 23343039]
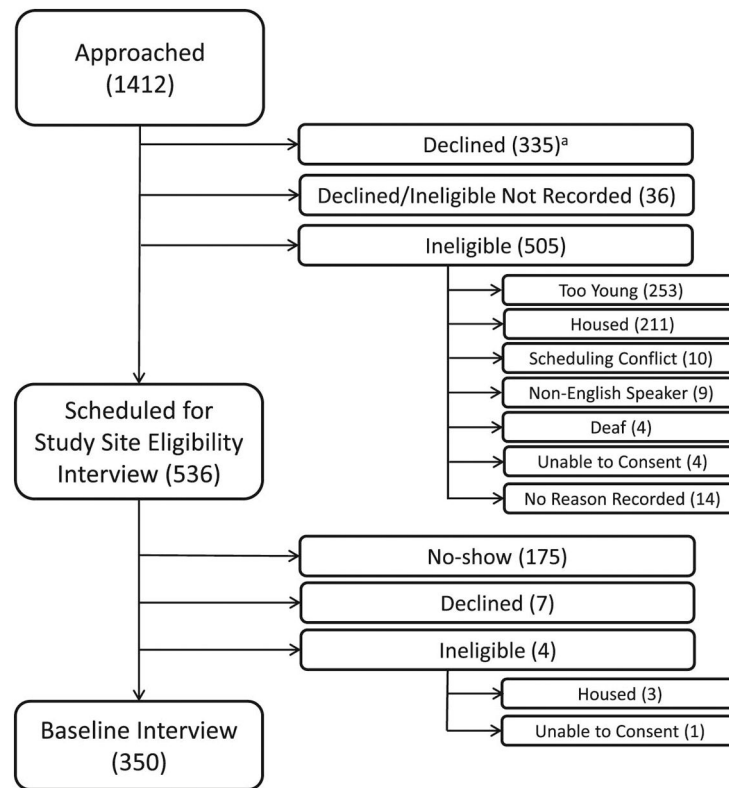
Figure 1.
Flow-chart of Recruitment of 350 Older Homeless Adults[a]

[a]This figure shows the number of individuals approached, assessed for eligibility, and enrolled in the study, noting specific reasons for inability to enroll. Values represent the number of individuals in each group.

[b]Participants who declined after being approached (335) were not assessed for eligibility. Therefore, the number of participants who were ineligible for the study may have been higher than the numbers presented in this figure.

Table 1

Characteristics of Participants by History of Childhood Adversity

Variable	Total (n=350), n (%)	No History of Childhood Adversity (n=99), n (%)	History of Childhood Adversity (n=251), n (%)	P-value[a]
Age, y				
50–54	102 (29.1)	23 (23.2)	79 (31.5)	0.32[b]
55–59	117 (33.4)	38 (38.4)	79 (31.5)	
60–64	89 (25.4)	28 (28.3)	61 (24.3)	
65+	42 (12.0)	10 (10.1)	32 (12.7)	
Sex				
Male	270 (77.1)	77 (77.8)	193 (76.9)	0.86
Race/ethnicity				
African American	279 (79.7)	83 (83.8)	196 (78.1)	0.29[b]
White	38 (10.9)	7 (7.1)	31 (12.4)	
Hispanic/Latino	16 (4.6)	6 (6.1)	10 (4.0)	
Asian American	3 (0.9)	0 (0)	3 (1.2)	
Mixed/other	14 (4.0)	3 (3.0)	11 (4.4)	
Education Level				
High school graduate[c] or above	240 (68.6)	67 (67.7)	173 (68.9)	0.82
Marital Status				
Never married/partnered	145 (41.4)	40 (40.4)	105 (41.8)	0.87[b]
Separated/divorced	150 (42.9)	41 (41.4)	109 (43.4)	
Widowed	38 (10.9)	12 (12.1)	26 (10.4)	
Married/partnered	17 (4.9)	6 (6.1)	11 (4.4)	
Military Service				
Active duty/reserves/National Guard	76 (21.7)	17 (17.2)	59 (23.5)	0.20
Age of First Adult Homeless Episode, y				
18–25	52 (14.9)	11 (11.1)	41 (16.3)	0.60
26–49	146 (41.7)	41 (41.4)	105 (41.8)	
50–59	115 (32.9)	36 (36.4)	79 (31.5)	
60+	37 (10.6)	11 (11.1)	26 (10.4)	
Median Total Years of Adult Homelessness (IQR)	2.5 (0.7–8.0)	2.8 (0.9–8.3)	2.4 (0.7–8.0)	0.74[d]
Regular Substance Use, Lifetime History[e]				
Alcohol	206 (61.9)	44 (46.8)	162 (67.8)	<0.001
Cannabis	216 (62.4)	54 (55.7)	162 (65.1)	0.11
Cocaine	178 (51.7)	45 (47.4)	133 (53.4)	0.32
Amphetamine-type stimulant	50 (14.3)	7 (7.1)	43 (17.2)	0.01
Inhalant	9 (2.6)	0	9 (3.6)	0.06[f]

Variable	Total (n=350), n (%)	No History of Childhood Adversity (n=99), n (%)	History of Childhood Adversity (n=251), n (%)	P-value[a]
Sedative	15 (4.3)	0	15 (6.0)	0.01[f]
Hallucinogen	29 (8.3)	4 (4.0)	25 (10.0)	0.07
Non-prescribed opioid	52 (14.9)	13 (13.3)	39 (15.5)	0.59
Chronic Medical Conditions				
Hypertension	195 (56.0)	51 (52.6)	144 (57.4)	0.42
Coronary artery disease or myocardial infarction	32 (9.1)	9 (9.1)	23 (9.2)	0.98
Congestive heart failure	25 (7.1)	10 (10.1)	15 (6.0)	0.18
Diabetes	49 (14.0)	18 (18.2)	31 (12.4)	0.16
Stroke	39 (11.2)	8 (8.1)	31 (12.4)	0.25
Chronic obstructive pulmonary disease or asthma	92 (26.3)	21 (21.2)	71 (28.3)	0.18
Cancer[g]	21 (6.0)	9 (9.1)	12 (4.8)	0.13
HIV/AIDS	19 (5.5)	4 (4.1)	15 (6.1)	0.46
No chronic medical condition[h]	89 (25.4)	32 (32.3)	57 (22.7)	0.07
1 chronic medical condition[h]	117 (33.4)	29 (29.3)	88 (35.1)	
2 chronic medical conditions[h]	101 (28.9)	22 (22.2)	79 (31.5)	
3+ chronic medical conditions[h]	43 (12.3)	16 (16.2)	27 (10.8)	
Functional Status				
No ADL difficulties[i]	214 (61.1)	71 (71.7)	143 (57.0)	0.04
1 ADL difficulty[i]	44 (12.6)	8 (8.1)	36 (14.3)	
2+ ADL difficulties[i]	92 (26.3)	20 (20.2)	72 (28.7)	
No IADL difficulties[j]	177 (50.6)	57 (57.6)	120 (47.8)	0.24
1 IADL difficulty[j]	83 (23.7)	19 (19.2)	64 (25.5)	
2+ IADL difficulties[j]	90 (25.7)	23 (23.2)	67 (26.7)	
Cognitive Impairment[k]	90 (25.8)	30 (30.3)	60 (24.0)	0.23

Abbreviations: IQR, interquartile range; HIV/AIDS, human immunodeficiency virus/acquired immunodeficiency syndrome; ADL, activities of daily living; IADL, instrumental activities of daily living

[a] Pearson chi-square with 1 degree of freedom, except as noted

[b] Pearson chi-square with 3 degrees of freedom

[c] High school graduates excluded participants who passed the General Education Development (GED®) test.

[d] Wilcoxon non-parametric test

[e] Regular alcohol use was defined as using three or more times per week during which the participant reported feeling the effects of the alcohol. Regular illicit drug use was defined as using the substance three or more times per week.

[f] Fisher exact test

[g] Cancer excluded non-melanoma skin cancer.

h
Chronic medical condition was defined as hypertension, coronary artery disease or myocardial infarction, congestive heart failure, diabetes, stroke, chronic obstructive pulmonary disease or asthma, cancer (excluding non-melanoma skin cancer), or HIV/AIDS.

i
ADL difficulty was defined as difficulty completing bathing, dressing, eating, transferring, or toileting.

j
IADL difficulty was defined as difficulty taking transportation, managing medications, managing money, applying for benefits, setting up job interviews, or finding a lawyer.

k
Cognitive impairment was defined as a score of <7th percentile (i.e. 1.5 standard deviation below the mean of a reference cohort) on the Modified Mini-Mental Status Exam.

Author Manuscript

Table 2

Prevalence of Self-reported Childhood Adversities (Before Age 18)

Variable	Total (n=350), n (%)
Physical neglect[a]	38 (11.0)
Verbal abuse[b]	172 (49.3)
Physical abuse[c]	116 (33.3)
Sexual abuse[d]	46 (13.2)
Parental incarceration[e]	19 (5.5)
Parental death[f]	75 (21.4)
Child welfare system placement	29 (8.3)
Cumulative Number of Childhood Adversities[g]	
0	99 (28.3)
1	114 (32.6)
2	71 (20.3)
3	37 (10.6)
4+	29 (8.3)

[a] Physical neglect was defined as being left without adequate food or shelter.

[b] Verbal abuse was defined as being called names, threatened, sworn at, or made to feel stupid or worthless.

[c] Physical abuse was defined as experiencing physical violence perpetrated by another person using an object or being slapped, hit, punched, kicked, choked, or burned.

[d] Sexual abuse was defined as being pressured or forced to have sexual contact, to do something sexual, or to have sex.

[e] Parental incarceration was defined as having either parent incarcerated in jail or prison for a month or more before the participant reached age 18.

[f] Parental death was defined as experiencing the death of either parent before the participant reached age 18.

[g] Childhood adversities included any report of the following seven categories: physical neglect, verbal abuse, physical abuse, sexual abuse, parental incarceration, parental death, or child welfare system placement; each item was weighted equally.

Table 3

Factors Associated with Psychiatric Morbidity in Older Homeless Adults

	Moderate to Severe Depressive Symptoms (CES-D Score ≥22) (n=133)			History of Suicide Attempt (Lifetime) (n=45)			History of Psychiatric Hospitalization (Lifetime) (n=66)		
	Prevalence of depressive symptoms, n (%)	Bivariate OR (95% CI)	Multivariate AOR (95% CI)	Prevalence of suicide attempt, n (%)	Bivariate OR (95% CI)	Multivariate AOR (95% CI)	Prevalence of psychiatric hospitalization, n (%)	Bivariate OR (95% CI)	Multivariate AOR (95% CI)
Cumulative Number of Childhood Adversities[†a]									
0	22 (22.5)	REF	REF	2 (2.0)	REF	REF	13 (13.1)	REF	REF
1	40 (35.4)	1.9 (1.0–3.5)*	2.0 (1.1–3.7)*	10 (8.8)	4.6 (1.0–21.9)	4.6 (1.0–21.6)	18 (15.8)	1.2 (0.6–2.7)	1.2 (0.6–2.7)
2	32 (45.7)	2.9 (1.5–5.7)*	2.9 (1.5–5.7)*	9 (13.0)	7.2 (1.5–35.0)*	7.8 (1.6–37.4)*	11 (15.5)	1.2 (0.5–2.9)	1.2 (0.5–2.9)
3	19 (51.4)	3.7 (1.6–8.2)*	4.2 (1.9–9.7)**	10 (27.0)	17.8 (3.6–87.5)**	20.0 (4.1–98.1)**	9 (24.3)	2.1 (0.8–5.6)	2.1 (0.8–5.5)
4+	20 (69.0)	7.7 (3.0–19.4)**	6.0 (2.4–15.4)**	14 (48.3)	44.8 (9.1–220.7)**	44.7 (9.1–219.2)**	15 (51.7)	7.1 (2.8–18.2)**	7.1 (2.8–18.0)**
Age (+5 y)	-	0.6 (0.5–0.8)**	0.9 (0.9–1.0)**	-			-		
Graduated High School[b]									
No	86 (36.1)	REF		24 (10.0)	REF	REF	47 (19.6)	REF	
Yes	47 (43.1)	1.3 (0.8–2.1)		21 (19.4)	2.2 (1.1–4.1)*	2.4 (1.2–4.8)*	19 (17.3)	0.9 (0.5–1.6)	
Sex									
Male	101 (37.7)	REF		30 (11.2)	REF		45 (16.7)	REF	
Female	32 (40.5)	1.1 (0.7–1.9)		15 (19.0)	1.9 (0.9–3.7)		21 (26.3)	1.8 (1.0–3.2)	
Race/ethnicity									
African American	97 (35.1)	REF		33 (12.0)	REF		47 (16.9)	REF	
Non-African American	36 (50.7)	1.9 (1.1–3.2)*		12 (16.9)	1.5 (0.7–3.1)		19 (26.8)	1.8 (1.0–3.4)	

Abbreviations: CES-D, Center for Epidemiologic Studies Depression Scale; OR, odds ratio; AOR, adjusted odds ratio

[†] In all models, the overall (Type 3) p-value for childhood adversity score was <0.001.

[a] Wald chi-square p-value <0.05 with 1 degree of freedom, except for childhood adversities, which has 4 degrees of freedom

[b] Wald chi-square p-value <0.001 with 1 degree of freedom, except for childhood adversities, which has 4 degrees of freedom

[a]Childhood adversities include any report of the following seven categories: physical neglect, verbal abuse, physical abuse, sexual abuse, parental incarceration, parental death, or child welfare system placement; each item was weighted equally.

[b]High school graduate does not include participants who passed the General Education Development (GED®) test.