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Homelessness History Impacts on Health Outcomes and Economic and Risk Behavior Intermediaries: New Insights from Population Data

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Abstract

Using data from the Washington Behavioral Risk Factor Surveillance System, this study assesses the relationship between homelessness history and physical and mental health outcomes as well as between homelessness history and health risk behaviors and economic precariousness as important intermediaries of subsequent health outcomes. Study results indicate that persons with a history of adult homelessness have consistently poorer health outcomes as compared to never homeless persons, and that even after accounting for childhood adversity and social assets, adult homelessness remains a consistent and strong predictor of poor health. These findings indicate that adult homelessness is a key component in understanding cumulative risk and vulnerability. Study results emphasize the importance of considering homelessness history in comprehensive health assessment and intervention services, as well as the utility of using representative public health surveys to understand population trends in housing instability.

Prior research shows that homelessness is associated with negative outcomes across a variety of health domains. Compared to low-income but housed persons, homeless individuals are more likely to die at earlier ages and of preventable conditions, and to have higher prevalence and severity of acute and chronic illness as well as unmet health needs (Baggett, O'Connell, Singer, & Rigotti, 2010; Baggett et al., 2013; Lebrun-Harris et al., 2012; Zlotnick & Zerger, 2009). Additionally, homeless persons have much higher prevalence of behavioral health conditions and mental illness relative to other low-income groups (Burt & Aron, 2000; Kertesz et al., 2005).

Despite the sizeable evidence on poor health and health disparities among homeless persons, much of this work has focused on near-term effects of homelessness by focusing on the health of currently or recently homeless individuals. Less emphasis has been given to exploring the health of "ever homeless" persons, and the possible longer-term and/or cumulative effects of having ever experienced homelessness. Given the evidence on how

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homelessness negatively effects health and wellness in the near-term, and given that the majority of homeless persons are homeless for relatively short, transitional periods (Culhane, Metraux, Park, Schretzman, & Valente, 2007; Kuhn & Culhane, 1998), it is important to better understand how having a history of homelessness is correlated with later health experiences.

Homelessness Within Cumulative Disadvantage

Recent years have witnessed a shift in health explanation models from the predominantly biomedical to the biopsychosocial that can better account for multiple pathways to outcomes as well as life-course processes that undergird health development (Halfon, Larson, Lu, Tullis, & Russ, 2014). Stressful environments get “under one’s skin” through a series of neurobiological cascading responses that elevate allostatic load (reflecting the body’s ongoing efforts to adapt to repeated stress) that accelerates biological wear and tear and erodes health (Dowd, Simanek, & Aiello, 2009; McEwen, 1998). Life-course perspectives foster attention to individuals’ and populations’ aggregate experience wherein cumulative risk exposures and longer-range stress processes are focal in explaining later health disparities (Dannefer, 2003).

In the current article, we draw upon life-course and cumulative disadvantage theorizing to support an ecological perspective on the relationship of homelessness to health-related outcomes. We draw attention to two premises: (a) disparities in later life may be anchored in earlier adverse circumstances of those life courses and (b) adversities involve stressors that, rather than being discrete, can become entwined with other contemporaneous and subsequent stress. That is, stress functions proliferatively, wherein earlier life adversities, left unchecked, spawn circumstances that can become interlocking and cumulative chains of adversity that may erode health through multiple pathways (Ferraro & Shippee, 2009; Pearlin, Schieman, Fazio, & Meersman, 2005).

Growing evidence indicates that early adversities such as adverse childhood experiences (ACEs) constitute life anchors that foster stress proliferation. Pathways may take the form of less successful accrual of human capital, such as educational attainment and workforce success (Dupre, 2008; Zielinski, 2009), that in turn increases risks for residential insecurity. Negative effects of early adversity are also likely to influence the types of environments within which individuals are later located. Greater early adversity tends to be embedded in relatively stable conflictual or precarious conditions. These may both compromise development and elevate likely exposure to subsequent stressors, such as relationship strife, and poor social engagement, such as school performance (Raposa, Hammen, Brennan, O’Callaghan, & Najman, 2014). Early life and later compounded stress exposure may constrain developing and sustaining social capital such as stable supportive relationships that in turn carry secondary stressors such as social isolation and the absence of what might otherwise be stress-buffering assets (Hill, Kaplan, French, & Johnson, 2010; Vranceanu, Hobfoll, & Johnson, 2007).

Experiences of homelessness are nested within such developmental histories as well as current circumstances. Along with structural factors, adult homelessness has been found to

be significantly associated with early adversity such as ACEs (Herman, Susser, Struening, & Link, 1997; Larkin & Park, 2012) and adult experiences of social disconnect, substance use, hospitalization, and economic vulnerability (Bassuk et al., 1997; Fertig & Reingold 2008; Thompson, Wall, Greenstein, Grant, & Hasin, 2013). Lack of housing has been identified as a chronic stressor in and of itself (Avery, 2013). Moreover, the frequency, depth, and cumulative nature of life-course adversity experienced by homeless persons is notably greater than that experienced by other subpopulations (Padgett, Smith, Henwood, & Tiderington, 2012; Lippert & Lee, 2015). What is less clear is the extent to which *ever* experiencing adult homelessness accumulates with other health risks (e.g., ACEs, lower socioeconomic status, and lower levels of social support) to provide unique contributions that would account for (a) disparities in physical and mental health and (b) disparities in economic precariousness and health-risk behaviors that may convey risk between earlier adversity and later health outcomes.

The Value of a Population Perspective

To date, homelessness research has largely relied on local, nonprobability samples of persons currently experiencing homelessness (Montgomery, Cutuli, Evans-Chase, Treglia, & Culhane, 2013), including those drawn from emergency shelters, homeless service programs, and other targeted sampling frames. Although these samples provide critical information on the immediate correlates of homelessness, there are limitations in that shelter- and service-user data reflect only the experiences of recently—and largely service-engaged—homeless persons and thus cannot describe the longer-term effects of homelessness in the general population.

There is a need to understand whether a history of adult homelessness has enduring influence across different health domains and in models that account for multilevel risk and protective factors within broad and representative samples. Recently available population-representative health surveillance data provide a unique opportunity to examine how adult homelessness is associated with health outcomes, as well as the extent to which experiences of homelessness contribute a distinct vulnerability within a broader context of cumulative disadvantage.

Specially, this study answers three key questions: (a) How do patterns of mental and physical health outcomes, intermediaries such as economic precariousness and health-risk behaviors, and other adversity factors and social assets compare between adults with and without a history of homelessness? (b) What is the net effect of a history of adult homelessness on physical health, mental health, health-risk behaviors, and economic precariousness? (c) To what extent do routine surveillance data support a cumulative assessment of homelessness history in conjunction with related risk and protective factors to explain population health status?

Through these analyses, this study ascertains the extent to which adult homelessness history is a significant contributor to subsequent health conditions and health intermediaries. In addition, this study emphasizes the utility of using representative surveys to capture information on homelessness and health.

Methods

Sample

Data were obtained from the 2011 Behavioral Risk Factor Surveillance System (BRFSS) for Washington State—a cross-sectional, random-digit-dialed telephone survey conducted by health departments in all 50 states and U.S. protectorates in collaboration with the Centers for Disease Control and Prevention (CDC, 2011). Participants were English- and Spanish-speaking adults aged 18 years or older, who were noninstitutionalized and lived in a household with working telephone landlines or cellular telephone lines. Washington State uses a disproportionate stratified random sampling method with one adult per household randomly selected to participate in the survey. The sample for this study was restricted to respondents from Survey Form A and the Cell Phone Survey, as these forms included the majority of measures used in this study. Though the overall survey sample was $n = 10,143$, some study questions were only asked in certain months or on certain survey forms. Therefore, the available sample was based on subsets for whom responses to all study variables were available, and they ranged from 2,929 to 6,721 (noted in the tables accordingly).

Measures

Outcome variables—Multivariate indices were created for four distinct outcome variables pertaining to respondents' endpoint outcomes (mental and physical health) as well as intermediaries toward health outcomes (health-risk behaviors and economic precariousness). Health-risk behaviors and economic precariousness were selected as intermediary outcomes given prior evidence demonstrating their influence on physical and mental health (Braveman, Egerter, & Williams, 2011; Pampel, Krueger, & Denney, 2010). Use of multivariate indices provides for more stable and comprehensive assessment of health and economic statuses than single-item indicators allow. The distribution for each constituent measure in these indices is included in the online Appendix A.

The physical health index ($R = 0–6$, $M = 2.24$, $SD = 1.71$) was calculated as the sum of three indicators: self-assessed health assessment (0 = *very good/excellent*, 1 = *good*, 2 = *fair/poor*), the number of days general health was not good in the last month (0 = 0, 1 = 1–7, 2 = 8–30), and the number of chronic conditions the respondent had been diagnosed with (0 = 0, 1 = 1, 2 = 2+), the latter based on the sum of dichotomized "yes" responses across eight categories of diagnoses: high blood pressure, high cholesterol, heart disease, heart attack, stroke, cancer, diabetes, arthritis, and asthma.

The mental health index ($R = 0–6$, $M = 1.51$, $SD = 1.49$) was calculated as the sum of three indicators: the number of days mental health was not good in the last month (0 = 0, 1 = 1–7, 2 = 8–30), whether taking medication/receiving treatment for mental health and/or had ever been told they have a depressive disorder (0 = *no*, 1 = *medication/treatment* or *depressive disorder*, 2 = *medication/treatment and depressive disorder*), and level of mental health symptomology (0 = *none/few*, 1 = *some*, 2 = *frequent*) based on respondents' mean scores across six symptoms of mental health problems (feeling nervous, hopeless, restless,

depressed, everything an effort, worthless) assessed on a 5-point Likert scale (Kessler et al., 2002; $\alpha = 0.80$).

The health-risk behaviors index ($R = 0–8$, $M = 1.98$, $SD = 1.43$) was calculated as the sum of four indicators: alcohol use (0 = *no binge drinking/no heavy alcohol use*, 1 = *binge drinking or heavy alcohol use*, 2 = *binge drinking and heavy alcohol use*), body mass index (0 = *normal*, 1 = *overweight*, 2 = *obese*), smoking status (0 = *never*, 1 = *former*, 2 = *current*), and drug use in the past month (0 = *none*, 1 = *pain killer or marijuana use*, 2 = *pain killer and marijuana use*).

The economic precariousness index ($R = 0–3$; $M = 0.77$, $SD = 0.97$) was calculated as the sum of three dichotomous indicators of economic precariousness: how often in the past year the respondent worried about paying the rent/mortgage (0 = *never*, 1 = *more than never*), how often in the past year the respondent worried about buying nutritious meals (0 = *never*, 1 = *more than never*), and whether there was a time in the past year that the respondent could not see a doctor due to cost (0 = *no*, 1 = *yes*).

Adversity factors—History of homelessness was calculated as a dichotomous yes/no measure with positive responses including respondents who indicated having any of the following experiences since turning 18 years old: stayed in a car or other vehicle; stayed in an abandoned building or anywhere outside (i.e., street homeless); or stayed in a transitional housing program, hotel or motel paid by voucher, domestic violence shelter, or emergency shelter (i.e., sheltered homeless). In the current sample, 4.56% of respondents reported such experiences of adult homelessness; for the purposes of this study, this group is categorized as “ever homeless.” A cumulative measure of ACEs ($R = 0–8$; $M = 1.56$; $SD = 1.83$) was calculated as the sum of dichotomized *yes* responses across eight categories of adverse experiences before the age of 18: childhood household mental illness, household substance abuse, incarcerated family member, parental divorce, witnessing domestic violence, physical abuse, sexual abuse, and verbal abuse (CDC, 2011).

Social assets—Two indices identifying different social asset dimensions were included in all modeling in order to account for and determine the effect of such protective factors. A social capital index ($R = 0–4$, $M = 2.98$, $SD = 1.10$) was calculated as the sum of instrumental support network size (0 = *0 people*, 1 = *1–3 people*, 2 = *4+ people*) and marital status (0 = *divorced/separated/widowed*, 1 = *never married*, 2 = *married/partnered*). A human capital index ($R = 0–7$, $M = 4.58$, $SD = 1.81$) was calculated as the sum of education status (0 = *high school graduate or less*, 1 = *some college*, 2 = *college graduate or more*), employment status (0 = *unemployed*, 1 = *not in workforce, retired, student, homemaker*, 2 = *employed for wages*), home ownership (0 = *rent*, 1 = *own*), and income (0 = < $25,000, 1 = $25,000 to $49,999, 2 = $50,000 or more).

Analytic Plan

We followed the BRFSS recommendations in using sampling weights to match the age, gender, and race distribution of Washington State according to estimates from the U.S. Census Bureau. After index construction and preliminary analysis of univariate distributions and bivariate correlations, means-based comparisons (*t* and chi-square tests) were conducted

contrasting those with a history of adult homelessness and those without. We then ran separate stepped linear regression models for each of the four outcomes to assess additive effects for the following covariates: (a) demographics and ACEs, (b) history of adult homelessness, and (c) social assets (human capital and social capital indices). For physical and mental health outcomes, we added a fourth model to assess the relative contributions of economic precariousness and health-risk behaviors as theorized intermediary pathways to these health outcomes. This approach tests cumulative effects as well as the unique explanatory utility of each predictor accounting for shared variance with other predictors in the model. F test and R^2 values were used to determine model fit for each outcome.

Results

Means-Based Comparisons: Never and Ever Homeless

Results from sample comparison t tests are presented in Table 1. Respondents with a history of homelessness had consistently poorer statuses relative to never homeless persons with significantly higher scores on all health outcome indices—economic precariousness (1.80 vs. 0.73), health-risk behaviors (2.78 vs. 1.94), mental health (2.98 vs. 1.43), and physical health (3.38 vs. 2.19)—and lower scores for human and social capital (3.38 and 2.32 as compared to 4.63 and 3.01, respectively). Ever homeless persons also had more than twice as many childhood adversities, on average than never homeless persons (3.66 vs. 1.46).

Disparities in many of the specific measures included within the outcome indices further concretize these differences: 70% of never homeless persons identified having a support network of four or more people compared to only 50% of ever homeless persons. Ever homeless persons were 43% more likely to have worried about buying nutritious meals and 35% more likely to have worried about paying for housing costs than never homeless respondents. Regarding health, 43% of ever homeless persons reported being in fair/poor health compared to 16% of never homeless person; similarly, nearly 23% of ever homeless persons reported having frequent mental health symptoms compared to just 3% among never homeless persons. A full comparison of the individual items used to constitute study indices is provided in Appendix A online.

In terms of demographics (Table 1), respondents with adult homelessness histories were more likely to be younger than never homeless persons by an average of 7 years, to include sexual minorities, and to include respondents of color who were not Asian American. There were no significant gender differences across the two groups.

Regression Analyses

As indicated in Tables 2 and 3, even after controlling for multiple risk factors and social assets, a history of adult homelessness remains significantly associated with economic precariousness, engagement in high-risk health behaviors, and worse mental health and physical health. The magnitude of these associations is roughly comparable across the four outcomes; though these effects are not as large as that for ACEs, and to a lesser extent, for human capital (which is sizeable and significant in three of the four models), it is notable

that a history of adult homelessness remains a significant predictor net of all other covariates across all outcomes.

As referenced above, these multivariate results also indicate the importance of ACEs, human capital, and social capital as unique, direct contributors across the four outcome measures, and in the case of physical and mental health, the contribution of risk behaviors and economic precariousness as having significant intermediary effects. All of these predictors are associated with the outcome measures in the expected directions. Although there were no significant gender differences in the prevalence of ever experiencing homelessness, being female was associated with greater economic precariousness and poorer mental health, whereas being male was associated with greater engagement in health-risk behaviors and poorer physical health. Race and ethnicity coefficients did not reflect consistent patterns across outcomes. African American respondents were significantly associated with having more economic precariousness, Asian Americans were significantly associated with engaging in greater health-risk behaviors, and being Hispanic was associated with poorer mental health—though this last association faded after accounting for health-risk behaviors and economic precariousness in the fourth model (see Table 3). Age was positively associated with health-risk behaviors and poor physical health and inversely with economic precariousness and poor mental health.

Discussion

This study provides one of the first investigations into the effects of having a history of adult homelessness across a variety of health-related outcomes within a representative state population. The results provide a compelling picture of the unique and detrimental effects that adult homelessness experiences—however distal—have on economic precariousness and health-risk behaviors as well as on current physical and mental health statuses, controlling for other contributors. These findings underscore the magnitude of stacked disadvantage that separate those with and without histories of adult homelessness, with the roots in such differentials stemming back to childhood. This study expands the scope of prior work, demonstrating the value of population surveillance data in gaining insights regarding stress proliferative processes within which homelessness is embedded and health is eroded.

Risk and Protective Profiles of the Ever and Never Homeless

Homelessness is associated with interruptions in employment and educational attainment (Fantuzzo, LeBoeuf, Chen, Rouse, & Culhane, 2012), which have implications for earning potential, mate selection, and later family stability (McLanahan & Percheski, 2008). Periods of homelessness are often linked with other detrimental psychosocial and socioeconomic factors including domestic violence, substance abuse, and incarceration (Baker, Billhardt, Warren, Rollins, & Glass, 2010; Bassuk, Buckner, Perloff, & Bassuk, 1998; Kushel, Hahn, Evans, Bangsberg, & Moss, 2005).

The current study deepens this picture, illustrating significantly poorer physical and mental health statuses among those who have ever experienced adult homelessness as well as broadly patterned profiles of disadvantage across psychosocial factors that can serve to

exacerbate and sustain health erosion. Mental health is strikingly elevated among ever homeless persons in this study with this population having double the aggregate level of mental health problems than never homeless persons. Despite being younger on average than never homeless persons, ever homeless persons showed elevated and differential prevalence of chronic conditions. These trends are likely to grow further with age when the biological dysregulations already underway become more severe.

In addition, ever homeless persons' poorer scores on health-risk behaviors and social support point to factors likely to accelerate embodiment of stress. For example, significantly higher levels of substance use (tobacco, alcohol, and drugs) among ever homeless persons, as well as higher obesity prevalence, may reflect biological dysregulations associated with life-course persistent stress that foster coping responses, which in turn lead to negative health and functioning outcomes. Only 37% of ever homeless persons had a marital partner compared to 60% of never homeless persons, as well as significantly fewer people they could turn to for help—signaling social isolation. Ever homeless persons were disadvantaged across every socioeconomic indicator comprising human capital and had double the level of economic precariousness that taps financial insecurities directly linked to health (i.e., ability to pay for food, residence, and health care insecurity).

Although the temporal sequencing of these factors cannot be fully assessed, the pattern of associations is clear and paints a picture of past, recent, and likely continuing socioeconomic vulnerability for adults who are ever homeless. Moreover, the more than doubled level of ACEs among ever homeless persons is suggestive of childhoods that offered broader spectrum stress exposures and fewer protections as compared to never homeless counterparts. Consistent with life-course theorizing, homelessness is associated with myriad life experiences that can have a cascading relationship to one another and, both incrementally and in combination, undermine security and health for those individuals and for others who depend on or are affected by them (Coohey & Easton 2016; Padgett et al., 2012). When examined collectively, these interconnected life-course factors reveal multiple socioeconomic, social relational, and stress embodiment pathways to compromised health.

Homelessness as a Persistent and Independent Risk Factor for Health

Regression analyses highlight that a history of adult homelessness continues to be significantly predictive of worse health outcomes and factors of economic precariousness and risk behaviors that can serve as intermediaries to accelerated health erosion, even after accounting for other early life-course risks (i.e., ACEs) and later protective factors in the form of social and human capital. The fact that significant homelessness associations remain net of other theorized factors points to the health jeopardy carried by homelessness exposure and indicates that the power of homeless history goes beyond experiences of lower socioeconomic resources (Avery, 2013; Rossi, 1989). The fact that this epidemiologic assessment of adult homelessness remains a significant predictor even without details such as timing or duration suggests toxicity of ever being exposed to this life stressor and the persistence of effects over time.

In terms of effect magnitude, a history of adult homelessness sustained slightly larger effects for poor physical health relative to mental health, the latter for which ACE effects were more

robust. The finding that ever homelessness experienced by adults was uniquely contributive to both physical and mental health controlling for both human capital and recent economic precariousness suggests that homeless experience carries more than poverty-related power. This argues for the importance of collecting information about prior homelessness experiences in both research and practice as a critical component of comprehensively understanding cumulative risk and vulnerability profiles.

Aside from age, level of ACEs was the single most consistently robust predictor in three of the four regression sets. Prior studies have established the long reach of negative effects of ACEs on physical and mental health deep into adulthood (Anda et al., 2006; Nurius, Green, Logan-Greene, & Borja, 2015; Nurius, Green, Logan-Greene, Longhi, & Song, 2016). The current findings further demonstrate significant contributions of ACEs, net of other predictors to health-risk behaviors, to economic precariousness linked to health and health care vulnerability within the context of homelessness.

A life-course perspective urges attention to the ways that variation in adversities and assets may be socially patterned, often beginning early in life and accumulating to produce relative advantages or disadvantages in health and related outcomes (Ben-Shlomo & Kuh, 2002; Braveman & Barclay, 2009). Our findings are consistent with the premise that adult homelessness exposure may function as part of this patterning, disproportionately arising out of developmentally vulnerable histories and, left unchecked, contributing to ongoing proliferating pathways of disadvantage to eroded health and happiness.

Limitations

The Washington BRFSS questions do not provide information on the timing of adult homelessness or the duration of homelessness occurrences. Because indicators for outcome measures are based on questions about behaviors and health status in the past year, this study assumes that reports of adult homelessness history generally preceded current experiences of economic precariousness, health-risk behaviors, mental health, and physical health. However, it is possible that experiences of adult homelessness could have occurred in the past year and be concurrent with other study outcomes. We believe this phenomenon to be relatively unlikely given the limitations of BRFSS sampling methods in reaching highly resource-poor groups wherein those currently or very recently homeless would be less likely to be located for study inclusion. Similarly, this study cannot assess whether histories of prolonged homelessness have worse effects on health outcomes than histories of shorter spells or as to whether homelessness experiences at certain ages is more or less harmful. More nuanced questions about homeless onset, timing, and duration are needed to be able to address these types of questions (Allgood & Warren, 2003; Dworsky & Piliavin, 2000; Tulloch, Fearon, & David, 2012).

The population characteristics of Washington State vary in some respects from those of other states. These variations may or may not bear upon the group comparative and multivariate linear trends reported here. The construction of multi-indicator indices should serve to increase the stability of the measures and trends in the findings. Although our findings are consistent with those reported from other sources, direct comparison with other state BRFSS data sets is not yet possible.

Implications for Practice and Policy

History of homelessness is an important indicator not only of housing instability but also of potential interruptions in life areas such as employment, education, health care, and psychosocial functioning. Although an individual may be long past a stint of insecure housing, this study demonstrates the potential, far-reaching effects of that adverse experience on multiple areas of adult functioning. For allied health professionals who work with vulnerable populations, including those who may be at risk for and/or experiencing housing instability, understanding how adverse experiences impact health and functioning across the life course is key to targeting prevention and intervention services.

Housing is much more than simple shelter. Homes provide safety and security, a sense of rootedness, respite from the outside world, and a place in which to make memories and enact traditions. Periods of housing instability and homelessness not only leave individuals without physical protection but also tear them from emotional and metaphorical shelter, making homelessness a traumatic experience in itself. Homelessness presents individuals, who may already have higher levels of trauma, with increased risk exposure and represents a socioeconomic interruption, compounding risk with decreased resources. Health professionals who work with clients and patients that may have experienced homelessness need to understand the consequences of homelessness for physical and mental health, and the role that home, not just shelter, plays in health and wellness.

Health assessment that includes psychosocial questions about ACEs, support networks, and socioeconomic resources, as well as questions regarding periods of housing insecurity, can help to shed light on an individual's health pathway, providing a fuller snapshot of risk factors as well as protective resources. Findings from this study indicate that adults with a history of homelessness have both higher levels of ACEs and poorer mental health outcomes. This combination of risk factors highlights the relevance of trauma-informed services for those patients and clients who have a history of adult homelessness. The pervasive nature of early trauma on later functioning undermines individual attempts to reach educational, economic, and personal goals and milestones. Trauma-informed services can help individuals achieve greater levels of mental health and take positive steps forward in critical life areas.

The health outcomes presented in this study demonstrate that those respondents with a history of homelessness have physical health profiles strongly indicative of "weathering"—the accelerated aging that tends to accompany persistent stress exposure with limited buffering resources (Salem et al., 2013). This result suggests that primary care physicians should be routinely assessing factors like ACEs and history of homelessness as risk markers of accelerated health erosion and that clinical interventions to curb onset or severity of chronic conditions need to start earlier than onset of clinical manifestations.

Given that the ever homeless respondents in this sample were younger than the never homeless individuals, consideration of family processes, in terms of parenting roles, should be taken into consideration. That is, those respondents who reported ever being homeless may have had dependent children and/or partners who were then homeless as well. Parents'

housing instability translates into a potential adverse childhood experience for children, which becomes part of an intergenerational transmission of early adversity effects (Larkin, Felitti, & Anda, 2014). Even if parents' experience of homelessness occurred before having children, findings from this study and others illustrate how homelessness makes its mark in terms of curtailing educational, economic, and social achievement and limiting access to resources, placing children and families at risk for poor health and socioeconomic outcomes (Dong et al., 2005; Grant, Gracy, Goldsmith, Shapiro, & Redlener, 2013; Kerker et al., 2011; Park, Metraux, & Culhane, 2010).

In addition, this study demonstrates the utility of using representative public health surveys such as the BRFSS to capture population trends regarding homelessness and housing instability. Despite critiques that such surveys have limited reach to resource-poor populations (who may lack telephone lines, reside in institutional settings, or be without currently listed contact information), these results show that approximately 5% of respondents reported a history of adult homelessness. This number, although small, is not trivial and provides an adequate sample from which to study public health trends among persons with histories of housing instability that broadens the relatively narrow range of questions that can be asked and answered with shelter-based data sources (Putnam-Hornstein, Needell, & Rhodes, 2013). Although the current BRFSS measures do not distinguish *currently* homeless persons, these results indicate that the survey does effectively reach persons who were *ever* homeless. This makes sense given that most homelessness is a temporary and transitional state (Kuhn & Culhane, 1998) and suggests value as a surveillance tool. At present, Washington is the only state that has added explicit questions about homelessness to the BRFSS.[1] This study provides an indication that other states might consider adding such questions to their surveys in order to provide a broader perspective on the intersections between housing history and public health outcomes.

Conclusion

These findings point to adult homelessness, even if limited or temporally distant, as a toxic stressor with unique and sustained effects on physical and mental health outcomes. Patterned association of adult homelessness with childhood adversity, as well as adulthood social and human capital, health behaviors, and proximal economic precariousness, indicate that homelessness is a key component in life-course cumulative risk and vulnerability. Our results emphasize the importance of considering homelessness history in comprehensive health assessment and intervention services, as well as the utility of using representative public health surveys to understand population trends in housing instability.

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[1]This information obtained via authors' email communication with all BRFSS state administrators in July 2014.

Appendix A

Sample Characteristics on Measurement Index Items Distinguishing Never From Ever Homeless Respondents

	Never Homeless N (%)	Ever Homeless N (%)	Significance Test
Human Capital Index			
Education			
HS Grad or less	2845 (29.50)	166 (35.85)	χ^2(2, 10107)=77.92, p<.000
Some College	2951 (30.60)	205 (44.28)	
College Grad or more	3848 (39.90)	92 (19.87)	
Employment Status			
Unemployed	1273 (13.92)	92 (29.11)	χ^2 (2, 9463)=71.23, p<.000
Not in workforce (retired, student, homemaker)	3442 (37.63)	67 (21.20)	
Employed for Wages	4432 (48.45)	157 (49.68)	
Own or Rent Home			
Rent or other	2120 (22.19)	266 (57.83)	χ^2 (1, 10015)=307.15, p<.000
Own	7435 (77.81)	194 (42.17)	
Income			
<$25,000	1870 (22.42)	267 (62.97)	χ^2 (2, 8763)=362.22, p<.000
$25,000 - <$50,000	2524 (30.27)	75 (17.69)	
$50,000+	3945 (47.31)	82 (19.34)	
Social Capital Index			
Instrumental Support Network			
0 people	286 (3.19)	39 (8.48)	χ^2 (2, 9430)=105.46, p<.000
1-3 people	2298 (25.62)	191 (41.52)	
4 or more people	6386 (71.19)	230 (50)	
Marital Status			
Divorced, separated, or widowed	2690 (27.93)	211 (46.07)	χ^2 (2, 10090)=103.59, p<.000
Never married	1116 (11.59)	79 (17.25)	
Married, partnered	5826 (60.49)	168 (36.68)	
Economic Hardship Index			
Worry about paying rent/mortgage			
Never	2523 (59.84)	47 (23.98)	χ^2 (1, 4412)=99.06, p<.000
Rarely/Sometimes/Usually/Always	1693 (40.16)	149 (76.02)	

	Never Homeless N (%)	Ever Homeless N (%)	Significance Test
Worry about buying nutritious meals			
Never	3291 (76.87)	68 (33.83)	χ^2 (1, 4482)=189.43, p<.000
Rarely/Sometimes/Usually/Always	990 (23.13)	133 (66.17)	
Could not see a doctor in past year due to cost			
No	8605 (89.10)	289 (62.55)	χ^2 (1, 10120)=291.76, p<.000
Yes	1053 (10.90)	173 (37.45)	
High Risk Health Behaviors Index			
Alcohol Use			
No binge drinking or heavy alcohol use	7956 (85.32)	364 (80.71)	χ^2 (2, 9776)=9.23, p<.01
Binge drinking or heavy alcohol use	983 (10.54)	57 (12.64)	
Binge drinking and heavy alcohol use	386 (4.14)	30 (6.65)	
BMI categories			
Normal weight (<25.0)	3370 (37.02)	138 (32.02)	χ^2 (2, 9535)=18.91, p<.000
Overweight (25.0-30.0)	3306 (36.31)	137 (31.79)	
Obese (BMI>30.0)	2428 (26.67)	156 (36.19)	
Smoking Status			
Never smoked	5396 (56.09)	99 (21.48)	χ^2 (2, 10082)=351.81, p<.000
Former smoker	862 (8.96)	149 (32.32)	
Current smoker	3363 (34.95)	213 (46.20)	
Drug use in last 30 days			
No pain killer nor marijuana use	8587 (94.95)	364 (79.82)	χ^2 (2, 9500)=183.54, p<.000
Pain killer or marijuana use	443 (4.90)	88 (19.30)	
Pain killer and marijuana use	14 (0.15)	4 (0.88)	
Mental Health Index			
# of days Mental Health not good in last month			
0 days	6680 (70.01)	160 (35.32)	χ^2 (2, 9995)=364.60, p<.000
1-7 days	1744 (18.28)	108 (23.84)	
8-30 days	1118 (11.72)	185 (40.84)	
Ever told have depressive disorder and/or taking medication/treatment for MH?			
No	7200 (78.54)	211 (45.97)	χ^2 (2, 9626)=264.18, p<.000

	Never Homeless N (%)	Ever Homeless N (%)	Significance Test
Yes - has disorder or is taking medication/treatment for MH	1013 (11.05)	119 (25.93)	
Yes - has disorder and taking medication/treatment for MH	954 (10.41)	129 (28.10)	
Mental Health Symptoms			
No/few symptoms	2960 (32.05)	53 (11.50)	χ^2 (2, 9696)=457.06, p<.000
Some symptoms	5978 (64.73)	304 (65.94)	
Frequent symptoms	297 (3.22)	104 (22.56)	
Physical Health Index			
General Health Assessment			
Very good or excellent	5010 (51.90)	108 (23.38)	χ^2 (2, 10115)=250.61, p<.000
Good	3065 (31.75)	155 (33.55)	
Poor or fair	1578 (16.35)	199 (43.07)	

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Implications for Practice

- Evidence from this study indicates that a history of homelessness has persistent and lasting influence on health behaviors, economic security, and physical and behavioral health outcomes; as such, health professionals should incorporate the use of tools to assess both past and current housing insecurity as critical risk factors for health.
- This study demonstrates the utility of representative public health surveys to capture population health trends in homelessness and housing instability, and suggest that this approach may be expanded to other states.

Table 1

Sample Characteristics Distinguishing Never and Ever Homeless Respondents

	Never Homeless	Ever Homeless	Significance Tests
Demographics	M (SD)	M (SD)	
Age	57.04 (0.17)	50.43 (0.59)	t(10043)=8.22, p<.000
	N (%)	N (%)	
Sex			
Male	3983 (41.15)	191 (41.25)	χ^2 (1, 10143)=.0021, p<.964
Female	5697 (58.85)	272 (58.75)	
Race/Ethnicity			
White NonHispanic	8228 (86.05)	354 (77.46)	χ^2 (6, 10019)=78.86, p<.000
Black NonHispanic	130 (1.36)	12 (2.63)	
Asian	233 (2.44)	2 (0.44)	
Hawaiian/Pacific Islander	17 (0.18)	3 (0.66)	
Native American	90 (0.94)	10 (2.19)	
Hispanic	542 (5.67)	31 (6.78)	
Other/Multiracial	322 (3.37)	45 (9.85)	
Sexual Orientation			
Heterosexual	8828 (97.83)	417 (93.29)	χ^2 (2, 9471)=72.69, p<.000
Homosexual	139 (1.54)	11 (2.46)	
Bisexual	57 (0.63)	19 (4.25)	
	M(SD)	M(SD)	
Adverse Childhood Experiences (ACEs)	1.46 (0.02)	3.66 (0.11)	t(9076)= -24.77, p<.000
Social Asset Indices			
Human Capital	4.63 (0.02)	3.38 (0.11)	t(8154)=11.55, p<.000
Social Capital	3.01 (0.01)	2.32 (0.05)	t(9389)=13.27, p<.000
Health-Related Outcomes			
Economic Precariousness	0.73 (0.01)	1.80 (0.07)	t(4399)= -15.57, p<.000
Health Risk Behaviors	1.94 (0.02)	2.78 (0.07)	t(8824)= -11.78, p<.000
Mental Health	1.43 (0.02)	2.98 (0.09)	t(9477)= -21.94, p<.000
Physical Health	2.19 (0.02)	3.38 (0.09)	t(9292)= -13.83, p<.000

Table 2

Multivariate Regressions of Demographics, ACEs, Homelessness, and Assets on Economic Precariousness and Health Risk Behaviors (standardized βs)

	Economic Precariousness (n= 3262)			**Health Risk Behaviors (n= 6721)**		
	Step 1	**Step 2**	**Step 3**	**Step 1**	**Step 2**	**Step 3**
F	28.09	32.29	37.84	23.22	22.90	26.08
R^2	0.17	**0.18****	0.27	0.10	**0.11****	**0.12****
Age	**−0.24*****	**−0.24*****	**−0.26*****	**0.09*****	**0.09*****	**0.10*****
Male	–	–	–	–	–	–
Female	**0.10*****	**0.10*****	**0.06***	**−0.18*****	**−0.18*****	**−0.19*****
White	–	–	–	–	–	–
African American	**0.11*****	**0.11*****	**0.09****	0.04	0.03	0.02
Asian American	0.00	0.00	0.01	**−0.13*****	**−0.13*****	**−0.13*****
HPI	**0.02****	**0.02****	**0.01***	**0.02****	**0.01***	0.01
Native American	0.01	0.01	−0.01	0.03	0.03	0.02
Hispanic	**0.08****	**0.08****	−0.00	−0.00	−0.00	−0.04
Other/Mixed	0.03	0.03	0.01	0.02	0.02	0.02
Heterosexual	–	–	–	–	–	–
Gay/Lesbian	−0.01	−0.01	−0.00	−0.02	−0.02	−0.02
Bisexual	0.02	0.00	−0.01	**0.07****	**0.06***	**0.06***
ACE Score	**0.22*****	**0.19*****	**0.17*****	**0.18*****	**0.16*****	**0.15*****
Homeless (no)	–	–	–	–	–	–
Homeless (yes)		**0.12*****	**0.07****		**0.09*****	**0.08*****
Human Capital			**−0.30*****			**−0.12*****
Social Capital			**−0.06***			−0.02

Note.

* $p \leq .05$;

** $p \leq .01$;

*** $p \leq .001$;

– (referent group)

Table 3

Multivariate Regressions of Demographics, ACEs, Homelessness, Assets, and Health Behavior and Economic Risk factors on Health Outcomes (standardized βs).

	Poor Physical Health (n= 2929)				**Poor Mental Health (n= 3060)**			
	Step 1	**Step 2**	**Step 3**	**Step 4**	**Step 1**	**Step 2**	**Step 3**	**Step 4**
F	19.12	19.89	29.00	32.00	17.74	21.27	20.94	22.06
R^2	0.15	**0.18** *	**0.21** *	**0.25** *	0.17	**0.19** *	**0.21** *	**0.24** *
Age	**0.37** ***	**0.37** ***	**0.35** ***	**0.37** ***	**−0.10** ***	**−0.10** ***	**−0.12** ***	**−0.08** **
Male	–	–	–	–	–	–	–	–
Female	−0.02	−0.02	−0.05	−.03	**0.16** ***	**0.15** ***	**0.13** ***	**0.14** ***
White	–	–	–	–	–	–	–	–
African American	**0.06** *	**0.07** *	0.05	0.04	0.03	0.03	0.02	0.01
Asian American	0.00	0.00	0.00	0.03	−0.04	−0.04	−0.05	−0.04
HPI	0.01	0.01	0.01	0.00	0.00	0.00	−0.00	−0.00
Native American	0.05	**0.06** *	0.04	0.05	−0.04	−0.03	−0.04	−0.04
Hispanic	**0.09** *	**0.07** *	0.03	0.04	−0.03	−0.04	**−0.07** *	**−0.06** *
Other/Mixed	0.04	0.03	0.02	0.01	0.03	0.03	0.02	0.01
Heterosexual	–	–	–	–	–	–	–	–
Gay/Lesbian	−0.02	−0.01	−0.01	−0.01	−0.00	0.00	0.00	0.00
Bisexual	**0.09** *	**0.06** *	**0.05** *	0.04	**0.08** *	**0.06** *	**0.05** *	0.04
ACE Score	**0.18** ***	**0.13** ***	**0.12** ***	**0.07** **	**0.30** ***	**0.26** ***	**0.25** ***	**0.21** ***
Homeless (no)	–	–	–	–	–	–	–	–
Homeless (yes)		**0.18** ***	**0.15** **	**0.13** ***		**0.15** ***	**0.12** ***	**0.10** **
Human Capital			**−0.17** ***	**−0.12** ***			**−0.08** **	−0.02
Social Capital			**−0.06** *	**−0.06** *			**−0.10** ***	**−0.09** ***
Health Risk Bxs				**0.17** ***				**0.09** ***
Economic Precariousness				**0.11** ***				**0.16** ***

Note.

* $p \leq .05$;

** $p \leq .01$;

*** $p \leq .001$;

– (referent group)