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# A Longitudinal Examination of Adolescent and Young Adult Homeless Experience, Life Course Transitions, and Health

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## Abstract

While many have studied the antecedents of homelessness and health status among the actively homeless, no studies have evaluated the long-term health outcomes of formerly homeless adolescents and young adults. In this article, we examine the prospective association of early homeless experience and health outcomes after homelessness has subsided and whether factors that impede successful life course transitions following homeless experiences (e.g., low education attainment, depressive symptoms) mediate these associations. Among 4,651 National Longitudinal Survey of Youth–Child Study participants, formerly homeless adolescents and young adults (aged 15–25) were at greater risk of developing asthma, health-limiting conditions (HLCs), and fair/poor self-rated health over 8 years of follow-up, particularly among females. Factors that disrupt life course transitions mediated associations for asthma and HLCs. Using 20 years of life course information, this study demonstrates the enduring health risks for adolescents and young adults with homeless experience as they age.

## Keywords

adolescent homeless experience, adult health, transitions, life course

## Introduction

Although social scientists study the health implications of homelessness and life course transitions among adolescents and young adults, we know little about how early homeless experiences shape health later in life. Despite our rich understanding of the health status of young and actively homeless populations (see below), the struggle to understand long-term health consequences may be due to the relative scarcity of longitudinal data available about these groups (Klodawsky, Aubry, Nemiroff, Bonetta, & Willis, 2009). As a result, there have been no prospective studies to date of homelessness assessed during adolescence and young adulthood and health status in the years following a homeless experience.

During active periods of homelessness, adolescents and young adults experience poorer health than their domiciled counterparts across multiple domains including malnutrition, substance abuse, sexually transmitted diseases and depression (Bao, Whitbeck, & Hoyt, 2000; Baron, 2003; Finkelstein, 2005; Halcon & Lifson, 2004; Solorio et al., 2008; Thrane & Chen, 2010; Whitbeck, Hoyt, & Bao, 2000). They also have higher rates of specific physical health problems, including genitourinary problems, hepatitis, serious respiratory infections (pneumonia), lice, trauma (Wright, 1991), impaired cognitive functioning (Rubin et al., 1996), and asthma (Cutuli, Herbers, Rinaldi, Masten, & Oberg, 2010). Many of these disorders predate homeless experiences, but are also exacerbated by homeless conditions (Grant, Shapiro, et al., 2007; Whitbeck,

Hoyt, & Ackley, 1997) and a lack of access, avoidance, and unfamiliarity with health and social services (Hudson et al., 2010). Thus, health outcomes among homeless adolescents and young adults may be the result of a culmination of events that set in motion specific health risk trajectories, but which hinge on consequences relevant to the homeless experience itself.

Take, for example, asthma. The young and homeless are 3 to 6 times more likely to suffer from asthma than their nonhomeless counterparts and also have more severe asthma symptoms (Cutuli et al., 2010; McLean et al., 2004). Higher rates and severity of asthma symptoms may be the result of a number of “triggers” related to becoming and being actively homeless, including the disruption of health care, compromised living conditions, and psychosocial stressors, which may cumulatively increase asthma risk over time (Grant, Bowen, et al., 2007; McLean et al., 2004).

Alcohol abuse, substance abuse, and sexual risk behaviors may also similarly build over time. For example, family problems as well as psychological distress predated and during

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homelessness are each associated with higher rates of alcohol and substance abuse among actively homeless adolescents and young adults (Hagan & McCarthy, 1997, 2005; McMorris, Tyler, Whitbeck, & Hoyt, 2002; Rhule-Louie, Bowen, Baer, & Peterson, 2008; Tyler & Johnson, 2006). Similarly, sexual abuse and victimization prior to a homeless experience are linked to a greater number of sexual risk behaviors and increased risk of sexual victimization and other abuses once homeless (Melander & Tyler, 2010; Tyler, Hoyt, Whitbeck, & Cauce, 2001). Adverse circumstances and conditions experienced during periods of homelessness place adolescents and young adults in increasingly vulnerable situations and also accentuate the likelihood of these abuses, as well as victimization (Baron, 2003; Bousman et al., 2005; Greene, Ennett, & Ringwalt, 1997; Hagan & McCarthy, 1997; Whitbeck et al., 2000).

Gender also plays a role in determining health status among the young and homeless. Although homeless male and female adolescents and young adults engage in similar risky sexual activities, females are more likely to be victims of sexual assault and abuses on the street, placing them at greater risk of disease and illness (Tyler et al., 2001). As a result, young homeless females report higher rates of STDs than their male homeless counterparts and higher rates of pregnancy than nonhomeless females of a similar age (Wright, 1991). Such stressors and traumatic events may increase the risk for a range of chronic diseases (Cohen, Janicki-Deverts, & Miller, 2007) especially among females (Thurston & Kubzansky, 2007), including asthma (Yonas, Lange, & Celedon, 2012). When under stress, body systems are operating on higher levels than usual. In instances of chronic stress, such activation can lead to wear and tear on these systems and contribute to disease (McEwen, 1998).

Life course perspectives can help us understand the health trajectories of adolescents and young adults with homeless experiences and their long-term consequences (see, e.g., Ben-Shlomo & Kuh, 2002; Elder, 1974; Hagan & McCarthy, 1997, 2005; Sampson & Laub, 1995a, 1995b; Shonkoff, Boyce, & McEwen, 2009). Hagan and McCarthy (1997, 2005) suggest the homeless experience itself places adolescents and young adults in problematic (e.g., abusive, coercive, violent, criminal, and delinquent) situations on the street, inhibiting their chances of transitioning out of homelessness. Subsequently, this may increase the likelihood of alcohol and substance abuse (Greene et al., 1997) and depression (Bao et al., 2000; Whitbeck et al., 2000).

Moreover, the homeless experience inhibits formal and informal institutional participation (e.g. access to education, employment, and marriage) and sets these adolescents and young adults on pathways that reinforce and perpetuate, rather than resolve, delinquent trajectories (Hagan & McCarthy, 2005; Sampson & Laub, 1995a, 1995b). Participation in these institutions may be defined as “traditional pathways,” as they represent established and generally accepted means to produce social and economic stability later in life. Sampson and Laub (1995a) suggest that missing these key “turning points” provided through institutional participation, sets adolescents and

young adults on deleterious pathways. As such, these pathways may have implications for health and well-being later in life (see, e.g., Courtney & Dworsky, 2006; Hagan & McCarthy, 2005; Hughes & White, 2009; Phelan, Link, & Tehranifar, 2010; Thoits, 2010), although this possibility has not been examined explicitly.

In this article, we build on these research findings and life course perspectives to explore the consequences of adolescent and young adult homeless experience for health later in life and test mediation hypotheses concerning life course transitions. We hypothesized that adolescent and young adult homeless experience was associated prospectively with poor health later in life, independent of early life physical health, mental health, substance abuse, risky sexual behavior, and abuse. Moreover, we examined whether females who experienced homelessness as adolescents and young adults would have worse health later in life compared to males. Finally, since adolescents and young adults with homeless experience may be more likely to experience disrupted transitions by way of restricted access to formal and informal institutions (e.g., education, marriage), depression, and abuse substances, we hypothesized that the primary association of early homeless experience and health later in life may be explained or mediated by these factors.

This study contributes to the literature in several ways. This study is among the first to examine the association of adolescent and young adult homelessness with health outcomes in the years after the acute crisis of homelessness has subsided, and whether such associations vary by gender. We examined three health outcomes (asthma, health-limiting condition [HLC], and self-rated health) that could be plausibly linked to prior homelessness and represent robust predictors of current and future disease morbidity (Bopp, Braun, Gutzwiller, & Faeh, 2012). We tested our hypotheses controlling for social, behavioral, and health risks from early life that could confound homelessness and health associations. Also, since poor health contributes to homelessness and staying homeless (Culhane & Kuhn, 1998; Wong, Culhane, & Kuhn, 1997), our study uniquely examined only incident health conditions that emerged since the time of homelessness. Additionally, where factors that impede successful adolescent and young adult transitions have been shown to have deleterious influences on social functioning in adulthood, this study was among the first to link homelessness and failed transitions to health outcomes later in life.

## Method

### Sample

We analyzed a sample that includes children born to the female participants of the National Longitudinal Survey of Youth (NLSY), conducted in the United States, who have been followed semiannually since 1979. Beginning in 1986, children of the female NLSY participants were enrolled in a new child cohort (NLSY-C; Center for Human Resource Research [CHRR], 2006). Mothers and children have been interviewed every 2 years since 1986. Children enroll in the NLSY-C in the

survey year most closely following the child's birth. Several assessments are conducted at each interview and include reports of homeless experiences, socioeconomic status, health behaviors, and physical health. Data are collected via maternal report until the child is age 14. Participants aged 15 and older self-report. Response rates per NLSY-C interview wave are high. In 2006, 96% of mothers and children under age 15 and 85% of adolescents and young adults 15 and older completed the survey (CHRR, 2006).

The base analytic sample included NLSY-C participants who had homeless experience data available at ages 15–25 at least once in the years 2000–2006, and had covariate information ( $n = 4,651$ , 74% of adolescents and young adults interviewed in 2008). As we were interested in the experiences of adolescents and young adults as they aged, we restricted the sample to include those individuals between the ages of 15 and 25. Participants were on average 16 years old in 2000. Those with homeless experiences occurring exclusively after age 25 were not included in the sample.

We assessed three self-reported physical health outcomes (asthma, HLC, and self-rated health; see outcome measures below for descriptions). Individuals who experienced the health outcome prior to experiencing homelessness were excluded from the models predicting that outcome. Doing so allowed us to examine the development of health conditions since experiencing homelessness and assured that observed associations were not confounded by prior health status. Final analytic sample sizes were 4,067, 3,496, and 4,120 for asthma, HLC, and self-rated health analyses, respectively. Results were largely the same when conducting a complete case analysis and when imputing missing covariates with average values.

## Measures

**Adolescent and Young Adult Homeless Experience.** We assessed self-reported adolescent or young adult homeless experience with the single item available from the NLSY-C: “Since (date of last interview), have you ever been homeless, that is without regular housing that was yours or you could count on as a regular place to stay? (yes/no).” We pooled responses over the 2000–2006 waves to increase power as the majority of participants who reported homelessness experienced one homeless episode. We used data from 2000 to 2006 to temporally precede health outcomes. We examined homeless experience dichotomously as whether or not participants reported at least one homeless experience.

**Outcomes.** We examined one self-reported specific chronic health condition (asthma) and two global health outcomes (HLCs and self-rated health) in 2008. We selected these outcomes as they could be plausibly linked to adolescent and young adult homeless experience and were available for analysis. We assessed asthma as “Has a doctor, nurse or other health professional ever told you that you have asthma? (yes/no);” HLC as “Are you limited in the kind of work you can do on a job for pay because of your health? (yes/no);” and self-rated health (SRH)

as “How would you describe your present health?” SRH response options included excellent, very good, good, fair, and poor. This variable was assessed continuously, with higher scores indicating worse self-rated health (range 1–5).

**Pathway Variables.** We examined several factors that may impede successful transitions as potential mediators of adolescent and young adult homeless experience and later health associations. Potential pathway variables were assessed in 2006. This was temporally after the assessment of homeless experience and prior to health outcomes. Potential pathway variables included self-reported education attainment, marital status, depressive symptoms, and alcohol and drug use. Education attainment was assessed as the highest grade in school completed as of 2006. Marital status was dichotomized as married/not married. We also examined depressive symptoms, alcohol, and drug use as mediators, as these factors may cumulatively influence health status and impede successful transitions. Depressive symptoms were assessed with an abbreviated Centers for Epidemiologic Studies of Depression scale (CESD; Radloff, 1977) and treated continuously ( $\alpha = .71$ ). Substance use included heavy alcohol use, marijuana, and other drug use. Heavy alcohol use was assessed as having three or more drinks at least several times a month (yes/no); marijuana as any recent use in the past year (yes/no); and other drug use as any use of stimulants, cocaine, crack, hallucinogens, downers, glue, or other drugs (yes/no).

**Control Variables.** We controlled for demographic and other early life risk factors that may confound homeless and health associations (e.g., early life risky sexual behavior, alcohol use, substance abuse, mental health, abuse) as reported by the mother or adolescent/young adult participants. We assessed control variables in 1988–1998, which temporally precede homeless experiences. Demographics included age, gender, race/ethnicity (Hispanic, black not Hispanic, not black and not Hispanic), and socioeconomic status (years of maternal education). We measured abuse as whether an individual saw a psychologist or counselor for molestation or abuse, and risky sexual behavior as whether the age of first sex was prior to age 15. We measured early alcohol use as whether the age of first drink was prior to age 13, and early life substance use as any reported use of marijuana, cocaine, crack, sedatives, amphetamines, speed, or glue prior to age 13. We did not include tobacco use as a control variable as it did not meet criteria for a confounding variable (i.e., common prior cause of both homelessness and health outcomes; Rothman & Greenland, 1998).

We assessed maternal reported early life poor mental health (yes/no) in 1998 with the Behavior Problems Index (BPI) total problem scale (Zill & Peterson, 1986;  $\alpha = .92$ ) and the CESD scale (Radloff, 1977;  $\alpha = .69$ ). The BPI assessed the frequency, range, and severity of behavior problems for those younger than 15. The CESD assessed self-reported depressive symptoms of those aged 15 and older. Due to the ages at which the BPI and CESD were assessed, approximately half of the participants were missing either the BPI or the CESD in the years prior to homelessness. As such, the use of one scale over the

other to control for early life mental health would markedly reduce sample size. Therefore, we constructed a mental health variable that incorporates information from both the BPI and the CESD. Moreover, there is some conceptual overlap in BPI and CESD items that supported the decision to pool scores (e.g., BPI items: child is unhappy or depressed, child feels no one loves him or her; CESD items: I felt depressed, I felt that people dislike me). BPI and CESD scores were standardized to have a mean of 0 and standard deviation of 1. We categorized those with scores greater than two standard deviations above the mean as having poor mental health. BPI and CESD scores were positively correlated among those with data on both measures ( $r = .20, p < .0001$ ). Sensitivity analyses indicated that the pooled measure adequately assessed poor mental health, as it was robustly associated in the expected directions with key correlates including greater likelihood for experiencing adolescent and young adult homelessness ( $\chi^2 = 7.81, p = .005$ ), lower maternal education ( $t = 4.19, p < .0001$ ), greater likelihood of experiencing child abuse ( $\chi^2 = 9.1, p = .003$ ), and more depressive symptoms in adulthood ( $t = -5.56, p < .0001$ ). While associations of adolescent and young adults homeless experience and later health were not substantively different with and without the early life mental health variable in the models (data not shown), we report study findings controlling for early life mental health to be conservative.

### Analysis

First, we generated descriptive statistics for the full sample and by homeless experience. We evaluated associations for participant characteristics and homeless experience with independent  $t$  and  $\chi^2$  tests. We also examined bivariate associations among study outcomes and hypothesized mediators via independent  $t$ -tests,  $\chi^2$  tests, and Pearson's correlations. To test the hypothesis that adolescent and young adult homeless experience was associated with health after homelessness, independent of demographic and early life risk factors, multiple linear and logistic regression models per outcome were fit. To test whether homeless and health associations differed by gender, we stratified the regression models by gender and fit interaction terms. We evaluated our mediation hypothesis in two steps. First, we assessed whether experiencing homelessness was associated with disrupted transitions via multiple linear and logistic regression models with later education attainment, marital status, depressive symptoms, alcohol, and drug use as outcomes, controlling for demographic and early life risk factors. Second, we added the hypothesized pathway variables to the homeless experience and health models and evaluated evidence of mediation via coefficient changes (Baron & Kenny, 1986) and Sobel tests (MacKinnon & Dwyer, 1993). To meet criteria to be a mediating variable, the following must be observed: (1) prior homeless experience was significantly associated with the health outcome; (2) prior homeless experience was significantly associated with the pathway variable; (3) the pathway variable was significantly associated with the

health outcome when controlling for prior homeless experience; and (4) the association between prior homeless experience and health was attenuated when controlling for the pathway variable. Sobel tests were conducted to assess whether the observed mediated effects of the pathway variables were significantly different from zero. We additionally examined whether associations between homeless experience and potential pathway variables differed according to gender via interaction terms (data not shown). As there were no significant gender differences, we present gender-pooled associations of homeless experience and factors that may disrupt life course transitions and mediation models. All models were fit in SAS 9.1 using PROC GENMOD to adjust variance estimates for the presence of multiple siblings from the same mother in the sample.

## Results

### Descriptive Statistics

Table 1 summarizes the characteristics of the overall sample and according to homeless experience.  $p$  Values for  $t$  and  $\chi^2$  tests for bivariate associations between homeless experience and study variables are also provided. The sample was, on average, 24 years old in 2008, 50% male and racially diverse. The average level of maternal education was 12 years. Of the sample, 4.7% reported experiencing homelessness, and homelessness occurred on average at age 19 ( $SD = 2.4$ ; range 15–25 years). Those who experienced homelessness were significantly older in 2008 and had mothers with lower levels of education (all  $p < .001$ ) compared to those without prior homeless experience. Those who experienced homelessness were significantly more likely to experience abuse, poor mental health, and engage in early life risk behaviors prior to homelessness (all  $p < .01$ ), as well as have lower levels of education, more depressive symptoms, and higher levels of substance use in the years following a homeless experience compared to those without prior homeless experience (all  $p < .01$ ). Marital status was not significantly associated with homeless experience. Compared to having no homeless experience, homelessness was significantly associated with having an HLC and worse self-rated health in the years following that experience (all  $p < .01$ ). Asthma was not associated with homeless experience ( $p = .18$ ). Some bivariate associations were observed among study outcomes and hypothesized mediators. Asthma was associated with heavy drinking and marijuana use ( $\chi^2 = 4.6, p = .03$ ) and lower education attainment ( $t = 6.9, p < .001$ ). HLC was associated with higher depressive symptoms scores ( $t = 4.9, p < .001$ ) and drug use ( $\chi^2 = 12.1, p < .001$ ). Better self-rated health was significantly associated with fewer depressive symptoms ( $r = -.18, p < .001$ ) and less drug use ( $\chi^2 = 2.6, p = .01$ ).

### Homeless Experience and Later Health

Linear and logistic regression models testing the association of homeless experience and health at follow-up are provided in Table 2. All models are adjusted for demographic (age, race,

**Table 1.** Characteristics of Study Participants and Bivariate Associations with Homeless Experience.

Variable	Full Sample	Homeless Experience (2000–2006)		<i>p</i>
		Yes ( <i>n</i> = 207)	No ( <i>n</i> = 4,444)	
<b>Demographics</b>				
Age in 2008	23.7 (4.3)	25.8 (3.7)	23.6 (4.3)	***
Male	50.6	46.4	49.6	
Not black, not Hispanic	42.7	37.2	42.9	
Maternal education (years)	12.4 (2.4)	11.8 (2.4)	12.4 (2.4)	***
<b>Early life factors (1988–1998)</b>				
Early life abuse	1.2	3.9	1.1	***
Poor mental health	4.3	8.2	4.2	**
Early first sex	11.8	26.6	11.1	***
Early first alcohol	7.5	15.9	7.1	***
Early drug use	16.0	36.7	15.1	***
<b>Potential pathways (2006)</b>				
Education (years)	11.7 (2.2)	11.3 (1.7)	11.7 (2.2)	*
Married	12.1	12.1	12.1	
Depressive symptoms	4.6 (3.8)	7.1 (4.8)	4.5 (3.7)	***
Heavy drinker, marijuana user	26.9	44.9	26.0	***
Other drug use	8.7	27.1	7.8	***
<b>Health outcomes (2008)</b>				
Asthma	6.1	8.5	6.0	
Health-limiting condition	2.8	6.5	2.7	**
Self-rated health	2.3 (0.94)	2.6 (1.1)	2.2 (0.93)	***

Note. Cell entries are mean (standard deviation) for continuous variables and percentages for categorical variables. *p* Values correspond to independent *t* and  $\chi^2$  tests for the bivariate associations between homeless experience and continuous and categorical study variables, respectively. Descriptive statistics are calculated on the full sample (*n* = 4,651) except when looking at outcomes where additional exclusions have been made based on prior health status. \**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

gender, maternal education) and early life risk factors (abuse, mental health, early first sex, alcohol use, drug use) that were entered into the models simultaneously. Homeless experience was significantly associated with each health outcome assessed in the years after homelessness, independent of demographic and early life risk factors. The magnitude of the associations was large, with homeless experience associated with approximately 2-fold higher odds of developing asthma (odds ratio [OR] = 1.8, 95% confidence interval [CI]: [1.01, 3.2]; *p* < .05) and an HLC (OR = 2.2, 95% CI: [1.1, 4.4]; *p* < .05) later in life. Homeless experience was also associated with worse self-rated health ( $\beta$  = .29, *SE* = 0.08, *p* < .001) later in life.

### Gender-Specific Analyses

Table 2 depicts linear and logistic regression models testing the association of homeless experience and health at follow-up for the full sample and also stratified by gender. All models are adjusted for demographic and early life risk factors. We observed some gender-specific findings suggesting worse health for formerly homeless females as compared with males. Females who experienced homelessness had significantly higher risk of developing asthma and an HLC following homelessness compared to males. Males and females with homeless experience both experienced worse self-rated health following homelessness. The interaction terms for these associations were significant for

asthma (OR = 3.9, 95% CI: [1.1, 15.3]; *p* < .05), but not for HLCs (OR = 2.4, 95% CI: [0.93, 10.7]; *p* > .10), or self-rated health ( $\beta$  = -.12, *SE* = 0.16, *p* > .10).

### Homeless Experience and Disrupted Transitions

Table 3 lists linear and logistic regression models testing the association between homeless experience and factors that may disrupt successful life course transitions, controlling for demographic and early life risk factors. Experiencing homelessness was significantly associated with lower education attainment, more depressive symptoms, lower likelihood of being married, and greater likelihood of alcohol and substance abuse in the years following homelessness (all *p* < .05). These associations suggest that formerly homeless adolescents and young adults experience restricted access to health-promoting social institutions and have continued health risk trajectories following homeless experiences, which may impede making successful transitions as they age.

Table 4 lists the linear and logistic regression associations of homeless experience and health in the years following homelessness when additionally adjusting for the factors that may disrupt life course transitions. All models also control for demographic and early life risk factors. There was some evidence in support of mediation by these disruptive factors for asthma and HLCs, but not for self-rated health. For asthma, the coefficient for homeless experience was attenuated when the disruptive transition factors

**Table 2.** Linear and Logistic Regression Associations of Prior Homeless Experience and Health at Follow-Up for the Full Sample and Stratified by Gender.

Experienced Homelessness	Health Outcome		
	Asthma	HLC	SRH
Full sample	1.8* (1.01, 3.2)	2.2* (1.1, 4.4)	0.29*** (0.08)
Males	0.71 (0.23, 2.2)	1.2 (0.28, 5.3)	0.33* (0.13)
Females	2.9** (1.4, 6.1)	3.0** (1.3, 6.5)	0.24* (0.10)

Note. HLC = Health-limiting condition; SRH = self-rated health.

Cell entries include odds ratio (95% confidence intervals)/ $\beta$ (SE) for dichotomous/continuous outcomes, respectively. All models are adjusted for demographic (age, race, maternal education) and early life risk factors (abuse, mental health, early first sex, alcohol use, drug use). Models for the full sample additionally control for gender.

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

were added to the model, suggesting one or more factors were on the pathway between homeless experiences and health following homelessness. The Sobel test for education attainment indicated that the observed mediated effect was significant ( $t = 2.54, p = .01$ ), providing some evidence that having homeless experiences may influence asthma risk after that experience by way of education attainment.

For HLC, the association with homeless experience was also attenuated with the disruptive transition factors added to the model. Depressive symptoms and drug use each met criteria for being mediating variables of the homeless experience and HLC associations. Sobel tests indicated that the observed mediated effects of depressive symptoms ( $t = 3.39, p = .0007$ ) and drug use ( $t = 3.0, p = .002$ ) were significantly different from zero. This suggests that experiencing homelessness as adolescents and young adults may influence the development of HLCs after that experience by way of depressive symptoms and drug use.

There was no evidence that any transitional factor mediated the association of homeless experience and self-rated health in the years following a homeless experience. Homeless experience remained significantly associated with self-rated health when controlling for the potential pathway variables. In the fully adjusted model, homeless experience, education, and depressive symptoms were each independently associated with self-rated health in the years following a homeless episode.

## Discussion

This study demonstrated that adolescent and young adult homeless experience sets in motion a chain of events that negatively impacts multiple life domains in the years after the acute crisis of homelessness has subsided. We found that formerly homeless adolescents and young adults had significantly worse health later in life, particularly among females. Moreover, education attainment, depressive symptoms, and drug use in the years after a homeless experience partly mediated the associations for asthma and HLC, respectively. These findings are consistent with and extend related work that finds homeless

experience to be associated with poor health during adolescence and young adulthood. Moreover, where Hagan and McCarthy's (1997, 2005) work illustrates that adolescent and young adult homeless experience limits participation in social institutions which then promotes delinquency, our study illustrated that such limited institutional participation may also influence later life health outcomes as well. These findings are particularly noteworthy, as this study is among the first to examine the prospective relationship between adolescent and young adult homeless experience, transitional factors, and health outcomes in the years after homelessness.

We found some evidence that formerly homeless females may be at greater risk of poor health later in life than males. This finding is congruent with related homeless research that has found females to be at increased risk for experiencing more health-compromising events while on the street as compared to males (Wright, 1991). While males also experience victimization when homeless, our study suggests that females may accumulate different and greater amounts of deleterious experiences while homeless, which may shape gender-specific health trajectories over time. While the mediators we examined in this study were not patterned according to gender or homeless experience, gender-specific pathways may still exist. We encourage future work to examine a broader range of potential mediating factors to help explain why females who experience homelessness are at disproportionately higher risk of poor health than males later in life.

We also observed that adolescents and young adults who experienced homelessness went on to have lower levels of education attainment, which then contributed to higher risk of developing asthma. There are many ways in which adolescent and young adult homelessness, education attainment, and asthma may be jointly associated. For example, low education attainment may lead to lack of access to health care, low income, and subsequent substandard housing characterized by physical and psychosocial risks for asthma (e.g., mold, cockroaches, overcrowding, stress; Grant, Shapiro, et al., 2007; Wright & Subramanian, 2007). Moreover, the relationship between prior homeless experience, education attainment, and asthma may involve dynamic and reciprocal relations not examined in this study. For example, homelessness may contribute to the development of asthma, which may then lead to higher levels of school absenteeism and failure to complete high school. Low education attainment may then exacerbate asthma symptoms and disease severity. As this study is the first to examine relations between adolescent and young adult homeless experience, education attainment, and later asthma risk, we encourage future work to map potential dynamic relations and mechanisms linking education to asthma explicitly.

We also show that young people with homeless experience were significantly less likely to be married at follow-up, although marital status did not mediate homelessness and health associations. This may be attributable, in part, to the recent shift in average age of marriage from the early 20s to late 20s (U.S. Census Bureau, 2011). As our participants were in their early/mid-20s at follow-up, many may have not had the opportunity to marry regardless of their prior homeless

**Table 3.** Linear and Logistic Regression Models for the Association of Experiencing Homelessness and Factors That May Disrupt Life Course Transitions.

	Education Attainment	Depressive Symptoms	Marriage	Alcohol/Marijuana Use	Other Drug Use
	$\beta$ (SE)			OR (95% CI)	
Experienced homelessness	-0.74*** (0.13)	2.3*** (0.34)	0.57* [0.34, 0.97]	2.1*** [1.5, 2.9]	3.9*** [2.5, 5.8]

Note. SE = standard error; OR = odds ratio; 95% CI: 95% confidence interval.

*n* = 4,651 for each model. All models are adjusted for demographic (age, race, gender, maternal education) and early life risk factors (abuse, mental health, early first sex, alcohol use, drug use).

\**p* < .05. \*\*\**p* < .001.

**Table 4.** Linear and Logistic Regression Models for the Associations of Prior Homeless Experience and Factors That May Disrupt Life Course Transitions With Health Outcomes.

	Health Outcome		
	Asthma	HLC	SRH
Experienced homelessness	1.8 (0.96, 3.3)	1.5 (0.74, 3.1)	0.17* (0.08)
Education attainment	0.89** (0.82, 0.96)	0.98 (0.87, 1.1)	-0.04*** (0.01)
Marriage	0.80 (0.45, 1.4)	0.76 (0.37, 1.6)	-0.07 (0.05)
Depressive symptoms	1.0 (0.99, 1.1)	1.1*** (1.04, 1.1)	0.04*** (0.004)
Heavy alcohol/marijuana use	0.85 (0.60, 1.2)	0.90 (0.54, 1.5)	0.03 (0.04)
Other drug use	0.51 (0.29, 1.0)	2.4** (1.3, 4.4)	0.03 (0.06)

Note. HLC = health-limiting condition; SRH = self-rated health.

Cell entries include odds ratio (95% confidence intervals)/ $\beta$ (SE) for dichotomous/continuous outcomes, respectively. All models are adjusted for demographic (age, race, gender, maternal education) and early life risk factors (abuse, mental health, early first sex, alcohol use, drug use).

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

experience. Mediation analyses for marital status may be thus underpowered. To better characterize the role of marriage in homeless and health associations, future work should incorporate longer follow-up periods that encompass the late 20s and beyond.

This study has some limitations. We opted to pool adolescents and young adults together in an effort to understand how homeless experience during these periods shaped health outcomes later in life. However, mediating factors may be different for adolescents and young adults to such an extent that we may be overgeneralizing more complicated processes experienced during these two different transitional periods. Also, we examined a single item self-reported measure of homeless experience. We were unable to examine the duration of homelessness or number of homeless episodes due to limitations of the data set. Consistent with an accumulation of risk framework (see Shonkoff et al., 2009), adolescents and young adults with long durations of homelessness and/or multiple homeless episodes may have the highest risk of disrupted life course transitions and poor health later in life. Yet, we cannot isolate such subgroups in this analysis. We encourage future work to consider different types of adolescent and young adult homeless experiences in relation to transitions and health. Also, due to limitations of the data set, we rely on a number of dichotomous variables, including asthma and HLC outcome variables, which may be weak measures of the constructs of interest. Also, while we excluded individuals who reported having asthma prior to homelessness, it was not possible to identify young people who were symptomatic of asthma but not yet diagnosed and exclude

them from asthma analyses. Such misclassification of asthmatic individuals as asthma-free could contribute to overestimates of homelessness and asthma associations. Moreover, we were unable to control for early life mental health using a standard measure. While the measure we constructed performs moderately well, we acknowledge that some residual confounding by early life mental health may remain. Finally, all homeless and health outcome data are self-report. This could lead to recall bias and underreporting of sensitive health information and homeless experiences due to stigma (Ringwalt, Greene, Robertson, & McPheeters, 1998). Future work with verified data on homeless experiences, objective health indicators (e.g. biomarkers), and standardized early life mental health instruments would help overcome these issues.

This study also has a number of strengths. First, we capitalized on the longitudinal nature of the cohort and considered 20 years of prospectively assessed life course information. This included up to 8 years of follow-up from homeless experience to health assessments. Second, our measures of early life risk factors, homelessness, mediators, and health outcomes were all temporally distinct. This allowed for a strong test of study hypotheses. In addition, we examined the emergence of incident health problems that occurred after the homeless experience. Doing so, helped to rule out the possibility that poor health in adolescence or young adulthood precipitated the homeless event and underlie observed associations. Finally, we controlled for a wide range of potential confounding variables and considered several potential pathway variables in the



association of adolescent and young adult homeless experience and later health outcomes in a large population-based sample. Few data sources have such comprehensive information available over time among such a large sample. Taken together, the results from this study indicate enduring health risks for adolescents and young adults with homeless experience as they grow up. Disrupted transitions may account for such associations. These findings are particularly noteworthy, as the participants were in their mid-20s at follow-up, a typically healthy time of life. Continuing along this poor health trajectory may lead to significant health problems as they age.

This study has some implications for scholars and practitioners interested in issues related to homelessness, life course transitions, and health. Adolescents and young adults are precariously situated on a continuum from childhood to adulthood. Their chances at making successful life course transitions are determined by how well they are able to navigate this period. Experiencing homelessness during this transitional life phase may hinder one's ability to successfully navigate institutions that contribute to social success and healthy living later in life. Also, as this high-risk population ages, their health will likely continue to deteriorate and costs associated with their care and service use will grow. Primary prevention of adolescent and young adult homelessness and disrupted transitions may not only protect health but also reduce the burden placed on health care and social service systems. As this study is among the first to link adolescent and young adult homeless experiences to later health via access to social institutions and disrupted life course transitions, future work should replicate our findings and continue to map other linkages, including positive factors that may buffer the deleterious effects of homelessness and suggest avenues for intervention. Doing so may not only alter risk trajectories of vulnerable adolescents and young adults but may also protect health for a lifetime.

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