Homelessness During Infancy: Associations With Infant and Maternal Health and Hardship Outcomes

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Abstract

- *Objective: Homelessness among children is correlated with developmental delays, fair or poor health, and high healthcare utilization (AAP, 2013). Associations of homelessness specifically among infants younger than 12 months, however, are unknown. This study evaluates homelessness during infancy as a risk for adverse infant and maternal health and hardship.*
- *Methods: From May 2009 to December 2015, 9,980 mothers of infants younger than 12 months were surveyed at emergency departments and primary care clinics in five U.S. cities. Infants were classified as having a history of homelessness if they were homeless at any point versus being consistently housed during their first year. Infant health outcomes included caregiver report of fair or poor health, developmental risk, and hospitalizations. Maternal health outcomes included self-report of fair or poor health and positive screen for depressive symptoms. Hardships included household and child food insecurity and foregone medical care or prescriptions due to cost.*
- *Results: After adjusting for potential confounders, homelessness during infancy was associated with higher adjusted odds of fair or poor infant health (adjusted odds ratio [AOR] 1.71; 95-percent confidence interval [CI] 1.18, 2.47;* $p < 0.01$*) and developmental risk (AOR 1.62; 95-percent CI 1.04, 2.53;* $p = 0.03$*), but not hospitalizations. Compared with consistently housed mothers, mothers with a history of homelessness had higher adjusted odds of fair or poor health and depressive symptoms. History of homelessness was associated with higher adjusted odds of household and child food insecurity and foregone health care for family members other than the infant.*
- *Conclusions: Homelessness in infancy is associated with adverse outcomes for infants and mothers. Interventions providing housing and other health-related resources to homeless families with infants may improve health and family hardship.*

Introduction

In the United States, approximately 1.27 million children younger than 6 are homeless in a given year. (HHS Administration for Children and Families, 2016). In 2015, the U.S. Department of Housing and Urban Development found nearly one-half of families experiencing homelessness had a child under the age of 6, and 10.4 percent of homeless families had an infant under 12 months of age (HUD, 2015). According to HHS Administration for Children and Families (2016), infancy is the period of life when a person is most likely to live in a homeless shelter.

Stable housing is a foundation for children's healthy growth and development (Sandel et al., 2018), particularly from conception through the first 3 years of life, when the brain and body are growing and developing most rapidly. Prenatal homelessness is associated with higher adjusted odds of low

birth weight and preterm delivery (Cutts et al., 2015; Little et al., 2005). Deprivation during the most rapid period of brain development can fundamentally impact the architecture of the brain leading to long-term impacts on cognitive, socioemotional, and motor ability (Berkman, 2009; Shonkoff and Garner, 2012; Shonkoff and Phillips, 2000).

It is well-documented that children under age 18 who experience homelessness, as compared with stably housed children, manifest increased risk for multiple adverse health conditions, including a greater likelihood of chronic and acute illness, developmental delay, behavioral problems, early substance use, high-risk sexual behaviors, and poor school performance, in addition to more limited access to health care (Bassuk, 1991; Noell et al., 2001; Rubin et al., 1996; Weinreb et al., 1998). Throughout early childhood, not specifically during infancy, homelessness is associated with developmental delays and psychiatric disorders (Grant et al., 2007).

Maternal well-being is also necessary for optimal infant development (Casey et al., 2004; Cummings and Davies, 1994). Previous research indicates that maternal mental health, particularly depression, is a mediating factor for child health outcomes (Ashiabi and O'Neal, 2007). Homeless mothers are more likely to suffer worse physical and mental health than the general population and have higher incidence of acute and chronic conditions including asthma, chronic anemia, chronic ulcers, and unmet dental needs (Rog and Buckner, 2007; Weinreb et al., 2006; Zima, Wells, and Benjamin, 1996).

For most families, homelessness is a consequence of limited financial resources to afford stable housing (Grant et al., 2013). Families with children who are homeless may also concurrently experience other economic hardships, including food insecurity and lack of access to affordable health care (Gundersen et al., 2003; Miller and Lin, 1988). Each hardship alone is associated with poor health outcomes in children and adults (Ayanian, Weissman, and Schneider, 2000). Even after a family is no longer homeless, economic hardships associated with limited financial resources persist (Gubits et al., 2016). Cumulatively, these hardships exert additive short- and long-term negative effects on family health and well-being (Frank et al., 2010; Grant et al., 2013).

To our knowledge, no information can be found about the association of homelessness with health outcomes of infants and their mothers and the risk of other concurrent economic hardships. The goal of the current study is to assess whether homelessness in infancy was associated with adverse health and hardship outcomes for mothers and infants during this particularly vulnerable year of life.

Methods

Children's HealthWatch (http://www.childrenshealthwatch.org) is an ongoing collaborative research study monitoring the health and well-being of young children and their families in the United States since 1998. Children's HealthWatch collects data in Baltimore, Boston, Little Rock, Minneapolis, and Philadelphia. This network of researchers examines associations of family economic hardships and participation in public assistance programs on young child and caregiver health.

This analysis used data from the cross-sectional Children's HealthWatch study. As described previously (Rose-Jacobs et al., 2016), trained research assistants elicited caregivers' verbal responses to a 20-to-30 minute survey of household demographics, maternal and child health, and household

housing status and economic hardships. Participants were caregivers seeking medical care for their child younger than 48 months of age in emergency departments or primary care clinics in hospitals in the five cities. Eligibility included English, Spanish, and (in Minneapolis only) Somali speakers, state residency, and knowledge of the child's health and household. For this analysis, the sample was restricted to families of children less than 12 months old. Caregivers of critically ill or injured children were not approached. Each site obtained institutional review board approval prior to data collection, which was renewed annually. All research was conducted in accord with prevailing ethical principles.

Of the 32,610 caregivers of children younger than 4 approached between May 1, 2009, and December 31, 2015, 3,607 (11.1 percent) were ineligible for the study and 2,158 (7.4 percent) refused or were unable to complete the interview. Children younger than 12 months comprised 12,989 (48.4 percent) of the completed interviews. To better ensure that participants had relatively similar economic backgrounds, exclusion criteria included private insurance and homeownership, which excluded 2,267 (17.4 percent) of families with children younger than 12 months. Additionally, given previously published associations between prenatal homelessness and health outcomes, 742 infants (2.3 percent) whose mothers were homeless during pregnancy were also excluded. The final analytic sample was 9,980.

Measures

Demographics. Variables collected included study site and clinical setting, mother's country of birth (United States or other); age; race and/or ethnicity; marital status; education and employment; infant's sex, age, insurance status, birth weight, and breastfeeding history; and number of children in household.

Homeless during the infant's lifetime. Participants were asked "Since your child was born has s/he ever been homeless or lived in a shelter?" Homelessness was defined as living in a shelter, motel, and other transitional living situations or not having a consistent place to sleep at night. Those participants who reported currently living in a shelter, motel, car, or no consistent place to sleep at night were included in the homeless group. Participants were classified into two categories: (1) "consistently housed"—no history of homelessness since the infant's birth, and (2) "history of homelessness"—homeless for any period of time since the infant's birth.

Child health. Infant health status was measured using the RAND Corporation health status question asking caregivers to rate their infant's overall health at the point in time of the interview as excellent, good, fair, or poor (National Center for Health Statistics, 1998). The outcome variable for this study combined response options into two categories: fair or poor compared with excellent or good child health. Fair or poor reported health status is highly predictive of increased health services utilization and higher healthcare costs (O'Hara and Caswell, 2013). Caregivers were also asked if the infant had been hospitalized other than at birth ("lifetime hospitalizations").

Developmental risk. Caregiver concerns about the infant's developmental status for infants four months or older (n = 5,336, 53.5 percent of the sample) were ascertained using the Parents' Evaluation of Developmental Status (PEDS), a validated screening tool (Glascoe, 2000). Parents described concerns about their child's development at the time of the interview. Developmental risk was defined by endorsement of two or more concerns on the PEDS.

Maternal health. Maternal health status was measured by self-report of health status as excellent, good, fair, or poor (CDC, 1994). The outcome variable for this study combined response options into two categories: fair or poor compared with excellent or good caregiver health. Maternal depressive symptoms were detected using the Kemper scale (Kemper and Babonis, 1992). This scale consists of three validated questions: (1) "How many times in the past week has this statement been true for you? I felt depressed (affirmed feeling depressed for one or more days in the past week)"; (2) "In the past year, have you had 2 weeks or more during which you felt sad, blue or lost pleasure in things that you usually cared about or enjoyed?"; and (3) "Have you had 2 or more years in your life when you felt sad most days, even if you felt okay sometimes?" Caregivers who responded affirmatively to two or more questions were categorized as positive for depressive symptoms.

Food insecurity. The U.S. Food Security Survey Module, or FSSM, is an 18-question scale developed by the U.S. Department of Agriculture and is considered the "gold standard" in assessment of household food security (Bickel et al., 2000; USDA Economic Research Service, 2017). The assessment reflects the previous 12 months for each question. Households categorized as household food insecure (HFI) had at least three affirmative responses to nonchild-specific questions. Households categorized as child food insecure (CFI) gave affirmative responses to at least two of the eight child-specific questions in addition to at least three affirmative responses on nonchild-specific questions.

Foregone care. Participants were asked whether at any time (1) the index infant or (2) another family member had foregone needed health care (prescriptions and/or medical care) due to the family's inability to afford care.

Statistical Techniques

Multiple logistic regression analyses were performed, controlling for confounders including study site, mother's race or ethnicity, educational attainment, employment, marital status, breastfeeding history, child's age, and number of children in the household. All analyses were conducted using two-sided tests and a significance level of $\alpha = 0.05$. Statistical analyses were performed using SAS software (version 9.3; SAS Institute, Cary, NC).

Results

Between May 2009 and December 2015, 9,980 caregivers with infants were interviewed. Of those interviewed, 300 (3.0 percent) families had experienced homelessness since the birth of their infant, and 9,680 families (97.0 percent) were consistently housed. The mean age of homeless infants was slightly older than those consistently housed, 5.9 months (standard deviation [sd] = 3.6) compared with 4.8 months (sd = 3.6; $p < 0.01$). No significant difference was found in maternal age; overall mean age was 25.7 years (sd = 5.7). Also, no significant difference resulted for low birth weight status; overall, 13.7 percent of infants were born with low birth weights. Compared with consistently housed caregivers, those with a history of homelessness had higher rates of unemployment and of not having a partner (67.0 versus 81.0 percent and 62.8 versus 76.2 percent, respectively). Those with a history of homelessness had lower rates of high school or higher education completion (69.9 versus 58.3 percent). Consistently housed families on average had more children than those who experienced homelessness (2.4 versus 2.0; exhibit 1).

Exhibit 1

Sample Description According to Homelessness Status of Infants Younger Than 12 Months

Variable	Overall n (%)	Consistently Housed n (%)	Homelessness During Infancy n (%)	*p*-Value
Total participants	9,980 (100)	9,680 (97)	300 (3)	
Site				< 0.01
Baltimore	2,010 (20)	1,983 (21)	27 (9)	
Boston	1,752 (18)	1,615 (17)	137 (46)	
Little Rock	1,903 (19)	1,884 (20)	19 (6)	
Minneapolis	2,342 (23)	2,266 (23)	76 (25)	
Philadelphia	1,973 (20)	1,932 (20)	41 (14)	
Caregiver's place of birth				0.38
U.S. born (vs. foreign born)	7,248 (73)	7,037 (73)	211 (71)	
Child gender				0.66
Female	4,615 (46)	4,480 (46)	135 (45)	
Age of child (months)				< 0.01
Mean (std. dev.)	4.9 (3.6)	4.8 (3.6)	5.9 (3.6)	
Child breastfed				0.08
Yes	6,533 (66)	6,323 (65)	210 (70)	
Child's health insurance				0.23
Public (vs. none)	9,360 (94)	9,073 (94)	287 (96)	
Caregiver's ethnicity				< 0.01
Hispanic	3,330 (34)	3,197 (33)	133 (45)	
Black non-Hispanic	5,007 (51)	4,888 (51)	119 (40)	
White non-Hispanic	1,246 (13)	1,211 (13)	35 (12)	
Other	314 (3)	304 (3)	10 (3)	
Marital status				< 0.01
Married/partnered	3,663 (37)	3,592 (37)	71 (24)	
Caregiver's education attainment				< 0.01
Less than high school diploma	3,037(31)	2,913 (30)	124 (42)	
High school	4,035 (40)	3,924 (41)	111 (37)	
More than high school	2,879 (29)	2,816 (29)	63 (21)	
Caregiver's age				0.50
Mean (std. dev.)	25.7 (5.7)	25.7 (5.7)	25.5 (5.8)	
Caregiver's employment				< 0.01
Employed	3,249 (33)	3,192 (33)	57 (19)	
WIC				0.54
Yes	9,005 (91)	8,738 (91)	267 (90)	
SNAP				< 0.01
Yes	6,023 (61)	5,805 (61)	218 (73)	
Subsidized housing				< 0.01
Yes	1,883 (19)	1,865 (20)	18 (6)	
Low birthweight				0.26
Less than 2,500g	1,357 (14)	1,323(14)	34 (12)	
Number of children in household				< 0.01
Mean (std. dev.)	2.3 (1.3)	2.4 (1.3)	2.0 (1.4)	

SNAP = Supplemental Nutrition Assistance Program. std. dev. = standard deviation. WIC = Special Supplemental Program for Women, Infants, and Children program.

Notes: Chi-square testing was utilized for categorical variables, and a t*-test was utilized for continuous variables. Exclusion criteria included private health insurance, homeownership, index child >12 months of age, and prenatal homelessness.*

Unadjusted Outcomes

Infants with a history of homelessness had higher unadjusted rates of hospitalizations, fair or poor health, and developmental concerns than consistently housed infants (22 versus 18 percent, 12 versus 8 percent, and 14 versus 7 percent, respectively). Caregivers who experienced homelessness in the first 12 months of their infant's life were more frequently reported fair or poor health and depressive symptoms than caregivers who were consistently housed (31 versus 20 percent and 39 versus 18 percent, respectively). Of families who experienced homelessness, 44 percent reported household food insecurity compared with 25 percent of consistently housed families. Child food insecurity rates were also higher among those with a history of homelessness compared with consistently housed families (19 versus 11 percent). Families with a history of homelessness were more likely to forego needed medical care for any household member other than the index child than consistently housed families (21 versus 16 percent). Rates of foregone care for the index child did not differ between groups (exhibit 2).

Exhibit 2

Unadjusted Outcomes by Homelessness: Infant Health, Maternal Health, and Household-Level Hardships Among Infants Younger Than 12 Months

Variable	Overall n (%)	Consistently Housed n (%)	Homelessness During Infancy n (%)	*p*-Value
Total participants	9,980 (100)	9,680 (97)	300 (3)	
Child health				
Lifetime hospitalizations	1,808 (18)	1,742 (18)	66 (22)	0.08
Child health fair or poor	777 (8)	740 (8)	37 (12)	< 0.01
Developmental risk (PEDS two or more concerns)	368 (7)	340 (7)	28 (14)	< 0.01
Maternal health				
Maternal health fair or poor	1,979 (20)	1,887 (20)	92 (31)	< 0.01
Depression screen	1,770 (19)	1,656 (18)	114 (39)	< 0.01
Household-level hardships				
Household food insecurity	2,513 (25)	2,380 (25)	133 (44)	< 0.01
Child food insecurity	1,124 (11)	1,066 (11)	58 (19)	< 0.01
Household foregone care	1,634 (17)	1,570 (16)	64 (21)	0.02
Child foregone care	331 (3)	319 (3)	12 (4)	0.51

PEDS = Parents' Evaluation of Developmental Status.

Notes: Chi-square testing was utilized for categorical variables, and a t*-test was utilized for continuous variables. Exclusion criteria included private health insurance, homeownership, index child >12 months of age, and prenatal homelessness.*

Infant Health Outcomes

Compared with infants who were consistently housed, a history of homelessness during infancy was associated with higher adjusted odds of fair or poor child health (adjusted odds ratio [AOR] 1.71; 95-percent confidence interval [CI] 1.18, 2.47; $p < 0.01$) and developmental risk (AOR 1.62; 95-percent CI 1.04, 2.53; $p = 0.03$). Risk of lifetime hospitalizations (exhibit 3) did not differ between the two groups (AOR 1.17; 95-percent CI 0.87,1.58; $p = 0.30$).

Exhibit 3

Adjusted Outcomes by Homelessness: Infant Health, Maternal Health, and Household-Level Hardships Among Infants Younger Than 12 Months

Variable	Consistently Housed	Homelessness During Infancy AOR (95% CI)	*p*-Value
Lifetime hospitalizations	1.00	1.17 (0.87, 1.58)	0.30
Child health			
Child health fair or poor	1.00	1.71(1.18, 2.47)	< 0.01
Developmental risk (PEDS two or more concerns)	1.00	1.62 (1.04, 2.53)	0.03
Maternal health			
Maternal health fair or poor	1.00	1.87 (1.44, 2.43)	< 0.01
Depression screen	1.00	2.98 (2.30, 3.86)	< 0.01
Household-level hardships			
Household food insecurity	1.00	2.07 (1.62, 2.65)	< 0.01
Child food insecurity	1.00	1.59 (1.16, 2.17)	< 0.01
Household foregone care	1.00	1.74 (1.29, 2.35)	< 0.01
Child foregone care	1.00	0.78 (0.41, 1.46)	0.44

AOR = adjusted odds ratio. CI = confidence interval. PEDS = Parents' Evaluation of Developmental Status.
Notes: Adjusted for site, mother's race/ethnicity, educational attainment, employment status, marital status, child's age, breastfeeding history, and number of children in the household. Child's age not in maternal health outcome models.

Maternal Health Outcomes

Compared with mothers of infants who had been consistently housed since the birth of their child, mothers in the history of homelessness group had higher adjusted odds of being in fair or poor health (AOR 1.87; 95-percent CI 1.44, 2.43; $p < 0.01$) and screening positive for depressive symptoms (AOR 2.98; 95-percent CI 2.30, 3.86; $p < 0.01$; exhibit 3).

Household-Level Hardships

Compared with those consistently housed, families who had been homeless since the child's birth had higher adjusted odds of HFI (AOR 2.07; 95-percent CI 1.62, 2.65; $p < 0.01$), CFI (AOR 1.59; 95-percent CI 1.16, 2.17; $p < 0.01$), and foregone health care for family members other than the index child (AOR 1.74; 95-percent CI 1.29, 2.35; $p < 0.01$). Adjusted odds of foregone health care for the index child did not differ between the two groups (AOR 0.78; 95-percent CI 0.41, 1.46; $p = 0.44$; exhibit 3).

Limitations

This study has several limitations. First, significant findings in this cross-sectional study design reflect associations, not causation. Second, the study did not consider duration, whether the family was homeless once or over multiple periods of time, type or quality of alternative living arrangements for homeless families, or the housing quality for those who reported they were consistently housed. Quality of living arrangements may vary greatly within each group. Third, we did not collect information on other known risk factors of poor health outcomes that are more prevalent among homeless families compared with consistently housed families, including history of physical, emotional, or sexual abuse; exposure to interpersonal violence and community violence; substance use history; or mental health diagnoses (Bassuk and Rosenberg, 1988; Rog

and Buckner, 2007). These and other unmeasured covariates may contribute to adverse health outcomes described in this research. Finally, although other researchers independently validated the questions used in this study, respondents may have overreported or underreported negative child or maternal health outcomes. Previous research on the health status questions utilized in this study, however, show significant associations between reports of fair or poor health and higher healthcare utilization and costs (O'Hara and Caswell, 2013). Despite these limitations, the findings of this study provide evidence of the association between homelessness during infancy and adverse infant and maternal health outcomes as well as family material hardships, which have potential public policy implications.

Discussion

After controlling for confounders, we found significantly increased adjusted odds of poor infant and maternal health outcomes in families with infants who had experienced homelessness. These infants were at increased risk for fair or poor health and developmental risk, but not hospitalizations. Furthermore, their mothers were more likely to report their own health as fair or poor and more likely to report maternal depressive symptoms.

Families who experienced homelessness since the birth of the infant were more likely than consistently housed families to report an inability to afford enough food. Caregivers will often forego basic needs, including food, to buffer their children from the lack of family resources (Edin et al., 2013). In extreme instances, however, families are forced to decrease the quality or quantity of food for children, known as child food insecurity.

Families of infants who experienced homelessness were also more likely to report foregoing needed health care for other family members other than the index child due to family inability to afford the care.

Given previous research on the associations between homelessness during the prenatal period on birth outcomes, the findings of this article, and the prevalence of infants with histories of homelessness both prenatally and postnatally, more research is needed to address the potential cumulative impact of prenatal and postnatal homelessness on infant and early childhood health outcomes. Additionally, research on specific diagnoses and health indicators, such as those documented by health providers in medical records, beyond the reported outcomes of overall general health and development discussed in this article are necessary to understand the severity of health impacts homelessness during infancy has on child health.

The findings of this study demonstrate the potential toxicity of homelessness in the first twelve months of life as well as its potential effect on the health of caregivers. These data suggest that children who experience homelessness early in life may be at greater disadvantage than their peers as they grow and learn, but more research is necessary to identify the longitudinal impacts of homelessness during infancy on health and educational outcomes. Early exposures to adverse conditions and poor health are linked to negative health outcomes over the life course, especially when hardships persist (Shonkoff and Garner, 2012). Family homelessness also impacts parental physical and mental health, both of which are linked to negative health and developmental outcomes in children (Casey et al., 2004). Further, the impacts of homelessness may be compounded

by other material hardships. Inability to afford food and access health care are independently associated with poor health outcomes, but, as our previous work has shown, hardships experienced simultaneously increase risks of adverse child and maternal health outcomes (Frank et al., 2010).

This study adds to the extensive body of research on the negative child and family outcomes associated with lack of stable housing (Gubits et al., 2016). Previous Children's HealthWatch research demonstrates that more subtle housing instability short of homelessness significantly increases the risk of poor caregiver and child health as well as economic hardships (Sandel et al., 2018). Policies and programs that prevent homelessness and provide services that respond holistically to the combined needs of parents and children, also known two-generation strategies, for alleviating family hardships may improve health and child development. Evidence-based policies that help move families toward stable housing and increase the availability of affordable housing (Bailey et al., 2015) should be implemented widely, robustly funded, and expanded.

Conclusion

Homelessness during infancy is associated with early harm to children's health and development, poor caregiver health and maternal mental health, and additional material hardships for families. Each of these outcomes has long-term impacts on health, educational attainment, and workforce participation later in life. Together, the cumulative force of these impacts may exert lifelong negative effects on a child's future. Efforts to prevent homelessness and coordinate services for families experiencing homelessness, especially for families with young children, are urgently needed. Partnerships between healthcare systems, housing providers, early education providers, and social service agencies offer promising results for coordinating solutions that respond to family needs holistically. Adequate and stable federal, state, and local funding across sectors is critical for maximizing the impact of these innovative strategies. Additionally, increasing federal funding for programs that support the housing, health, early education and care, and nutrition needs for families can improve our national health and well-being and strengthen our country's future.

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