BRIEF REPORTS

Housing Stability and Access to General Healthcare and Reproductive Healthcare Among Women in Ohio

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Abstract

Background The relationship between housing instability and reproductive healthcare is understudied. We examined the association between housing insecurity and access and utilization of general healthcare, contraceptive healthcare, and abortion care.

Methods Using data from a population-representative survey of adult reproductive-age Ohio women (N = 2,529), we assessed housing insecurity (not paying rent/mortgage on time in the past year). We examined associations between housing insecurity and the following outcomes: (1) not being able to access general healthcare in the past year; (2) experiencing delays or difficulties in accessing contraceptive healthcare in the past year; and (3) ever having an abortion. We used unadjusted and adjusted logistic regression models. We selected confounders a priori and included age, socioeconomic status, and healthcare status.

Results Overall, 10.6% of Ohio women of adult reproductive age experienced housing insecurity. Approximately 27.5% of respondents were not able to access general healthcare and 10.4% experienced delays or difficulties in accessing contraceptive care. Compared to housing-secure respondents, housing-insecure women were less able to access general healthcare (adjusted odds ratio [aOR]:2.16; 95% confidence interval [CI]:1.45–3.23) and more likely to experience delays or difficulties when accessing contraceptive care (aOR:1.74; 95% CI:1.00-3.04). Insecure housing was not statistically associated with ever having an abortion (aOR:1.76; 95% CI:0.93–3.34).

Conclusions In this study, recent housing insecurity was associated with poorer access to general and contraceptive healthcare. Studies utilizing multidimensional measures of housing insecurity and other material insecurity measures are needed to further explore the relationship between material insecurity and access to general and contraceptive care.

Keywords Housing transition · Housing insecurity · General healthcare · Contraceptive healthcare · Abortion

Introduction

Homelessness, the most extreme form of housing insecurity, shapes human health (Baxter et al., 2019; Mari-Dell'Olmo et al., 2017; Reid et al., 2008). However, housing *insecurity*, a broad form of material instability and deprivation which includes homelessness (Kushel et al., 2006), has not been fully explored in relation to health. Measures of housing instability vary, and may focus on a single dimension or multiple dimensions, including high burden of rent, frequent moves (housing transition), overcrowding, or living with friends and family (Appleby & Desai, 1987; Bassuk et al., 1996; Duchon et al., 1999). Housing insecurity was widely experienced in 2017, 22.5% of United States (US) homeowners were moderately burdened (paying more than 30% of household income) or severely burdened (paying more than 50% of household income) by their mortgage payment and 47.4% of renters were moderately or severely burdened by their rent payment (Harvard, 2019). In 2020, these statistics are largely unchanged (Harvard, 2021). Additionally,

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the COVID-19 pandemic has worsened the housing affordability crisis in the US (Harvard, 2021) but the full extent of the pandemic's impact on housing may not be known for some time.

While a considerable literature examines the effect of homelessness on general healthcare access, and some literature examines homelessness and reproductive healthcare, few studies examine the association between housing insecurity and reproductive healthcare. People experiencing homelessness have lower utilization of primary care and higher utilization of emergency departments (Reid et al., 2008). Lack of primary care access can lead to delays in seeking care until a disease or condition requires emergency care, ultimately resulting in higher morbidity and mortality (Baxter et al., 2019; Kushel et al., 2006; Ma et al., 2008; Mari-Dell'Olmo et al., 2017). Such tradeoffs are rational (Maslow, 1943), as people often seek to fulfill basic needs (i.e., shelter) before more advanced needs (i.e., healthcare) (Cunningham et al., 1999; Henwood et al., 2015; Maslow, 1943). People will use their limited income to acquire stable housing and food before seeking medical treatment, even though in the long-term, healthcare costs may exceed the immediate costs of housing and food (Reid et al., 2008). Studies show people rank housing as a greater need than healthcare, and affirm that they would forgo healthcare utilization to secure housing and other basic needs (Dong et al., 2018). Individuals facing homelessness and housing insecurity are further limited in their healthcare options because many government and community organizations aimed at helping low-income households require addresses (Dennis et al., 2011).

Women who experience homelessness have less access to contraception and other reproductive health services than women with stable housing (Webb et al., 2003). While the impacts of homelessness on reproductive care access are clearly described (Kushel et al., 2006; Ma et al., 2008), the effects of housing instability on reproductive care are underexplored. We address this gap with analysis of a representative sample of adult, reproductive-age women in Ohio. We assess associations between two forms of housing instability (transition and insecurity) and three forms of healthcare access and utilization (general healthcare, contraceptive healthcare, and abortion).

Methods

Study design and study population. We used the first wave of data from the Ohio Survey of Women conducted by NORC at the University of Chicago from October of 2018 to June of 2019. The survey methodology is described elsewhere (*Evaluation of the Delaware Contraceptive Access*

Now Initiative). Briefly, the Ohio Survey of Women is a survey of people who identify as women 18–44 years of age living in Ohio. The survey was conducted in both English and Spanish. NORC utilized address-based sampling from the US Postal Service to create the sampling frame. The sampling frame was stratified based on area-level variables obtained from the US Census. NORC oversampled women living in rural Appalachia to ensure an adequate sample size from this subpopulation. NORC sent each selected household a letter with a web link and five follow-up invitations, inviting eligible participants to participate. Participants were compensated for participation. The final response rate of the survey was 33.5%.

Dependent variables. We examined three primary, dichotomous outcomes: (1) having access to general healthcare in the past 12 months; (2) experiencing delays or difficulties in access to contraceptive care in the past 12 months; and (3) lifetime use of abortion care. In regard to general healthcare, respondents were asked, "*In the past 12 months, was there any time when you wanted healthcare for yourself for any reason (such as getting a regular check-up or seeing a doctor when you were sick), but didn't get it?*" For birth control, respondents were asked, "*In the past 12 months, have you delayed or had trouble getting the birth control method you wanted for any reason?*"

To capture use of abortion, respondents were asked, "*How many times have you had an abortion (ended a pregnancy on purpose)?*" if they reported ever being pregnant (only 1,477 of 2,529 respondents reported ever being pregnant). We defined respondents who responded with 1 or more abortions as having had an abortion.

Independent variables. We examined two dichotomous exposures: housing transition and housing insecurity. Both are defined in several ways and no standard measures exist (Appleby & Desai, 1987; Bassuk et al., 1996; Duchon et al., 1999; Kushel et al., 2006; *Preventing homelessness: meeting the challenge*, 2002). We selected measures, or ones that were similar to those measures, that have been used previously by other studies (Appleby & Desai, 1987; Bassuk et al., 1996; Duchon et al., 1999; Kushel et al., 2006). To identify respondents who experienced housing transition, we use responses to the question, "*Did you live in this house or apartment 1 year ago?*". Respondents who said "no" were coded as having experienced a housing transition in the past year. To identify participants who experienced housing insecurity, we used responses to the question of whether respondents "*fell behind on my rent or mortgage*" in the past 12 months. We coded participants who said "yes" to this question as housing insecure.

Covariates. We selected potential confounding variables using directed acyclic graphs (DAG) (Greenland et al., 1999). Through each DAG, we identified the minimal

adjustment set for the analyses as age, socioeconomic status, and health insurance status. We categorized age into five categories: 18–24, 25–29, 30–34, 35–39, and 40–44 years. Seventeen (0.7%) respondents did not report age. For socioeconomic status (SES), we combined two variables, education and annual household income, to create a composite four-level categorical variable. SES levels included: (1) some college or less and <$75K income; (2) some college or less and $75K or more; (3) Bachelor's degree or higher and <$75K; and (4) Bachelor's degree or higher and $75K or greater. Among all respondents, 66 (2.6%) and 371 (14.7%) had missing data for education and household income, respectively. NORC used hot-deck imputation (Andridge & Little, 2010) to impute age, education, and income. We used a binary variable for having health insurance for the entire previous year (yes vs. no).

Data analysis. We implemented an available case analysis and excluded any individual who had missing data for any variable that was not imputed by NORC. We further excluded from the abortion-focused analyses all respondents who reported never being pregnant. We first calculated frequencies and weighted percentages of demographic characteristics to represent Ohio women 18–44 years old. To examine the associations between housing transition and insecurity and each primary outcome, we used unadjusted and adjusted logistic regression models. All analyses were completed in STATA (Version 16, STATA Corp. College Station TX) using survey weighting. NORC developed the survey weights which account for the probability of a household being selected, unknown eligibility status, interview non-response, household size, and adjustment for inconsistencies between the sample and population after imputation of missing data.

Ethical Statement. This study was approved by University of Chicago's Institutional Review Board (Protocol #18.08.14). All respondents provided consent. Our analysis was exempt from review by the Institutional Review Board at Ohio State University.

Results

Analytic sample size. The analytic sample differed by the independent-dependent dyad (Supplemental Table 1). Across all models, 41 respondents were excluded for missing data on covariates. For the housing transition-general healthcare model, 59 respondents were excluded for missing data on the independent or dependent variables yielding a final analytic sample of 2,429 respondents. For the housing transition-contraceptive healthcare model, 65 respondents were excluded for missing data on the independent or dependent variables yielding a final analytic sample of 2,423 respondents. For the housing transition-abortion model, 1,103 respondents were excluded due to a question skip pattern or for missing data on the independent or dependent variables yielding a final analytic sample of 1,385 respondents.

For the housing insecurity-general healthcare model, 123 respondents were excluded for missing data on the independent or dependent variables yielding a final analytic sample of 2,365 respondents. For the housing insecurity-contraceptive healthcare model, 125 respondents were excluded for missing data on the independent or dependent variables yielding a final analytic sample of 2,363 respondents. For the housing insecurity-abortion model, 1,143 respondents were excluded due to a question skip pattern or for missing data on the independent or dependent variables yielding a final analytic sample of 1,345 respondents.

Population characteristics. Approximately 25% of the population were 18 to 24 years old, and slightly less than half was in the lowest SES category (less than a bachelor's degree and less than $75,000 in annual household income) (Table 1). Approximately 22.2% of the population had experienced *housing transition* in the past 12 months, while 10.6% of the population had *insecure housing* in the past 12 months. Over a quarter (27.5%) had a challenge in accessing general healthcare and 10.4% experienced delays or barriers to contraceptive care in the past 12 months. Additionally, 8.3% reported ever having an abortion.

General Healthcare. People who reported housing transition had increased odds of not being able to access general healthcare in the past 12 months (unadjusted odds ratio [uOR]: 1.62, 95% confidence interval [CI]: 1.21, 2.17; adjusted odds ratio [aOR]: 1.31, 95% CI: 0.95, 1.82) compared to respondents who did not report housing transition (Table 2). People who were housing insecure had more than twice the odds of not being able to access general healthcare in the past 12 months compared to respondents who were housing stable (uOR: 2.59; 95% CI: 1.79, 3.75) (Table 2). After adjustment, housing insecurity remained significantly associated with lack of access to healthcare (aOR: 2.16; 95% CI: 1.45, 3.23).

Contraceptive Care. People who reported housing transition had increased odds of experiencing delays or barriers to contraceptive care in the past 12 months (uOR: 2.05; 95% CI: 1.34, 3.12; aOR: 1.38; 95% CI: 0.88, 2.16) compared to respondents who did not report housing transition (Table 2). People who were housing insecure had increased odds of experiencing delays or barriers to contraceptive care in the past 12 months compared to respondents who were housing stable (uOR: 1.87; 95% CI: 1.11, 3.13; aOR: 1.74; 95% CI: 1.00, 3.04) (Table 2).

Abortion Care. Among respondents who reported ever being pregnant, people who reported housing transition in
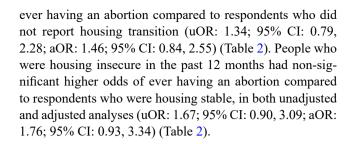
Table 1 Survey weighted characteristics of adult women of reproductive age in Ohio

Characteristic	Survey N = 2,529	Weighted Population N = 1,858,071	Weighted Percentage
Age			
18–24 years old	389	457,015	24.6%
25–29 years old	416	374,917	20.2%
30–34 years old	487	423,714	22.8%
35–39 years old	613	276,435	14.9%
40–44 years old	624	325,990	17.5%
Socioeconomic status			
< Bachelor's degree & < $75,000	947	846,945	45.6%
< Bachelor's degree & ≥ $75,000	330	200,140	10.8%
≥ Bachelor's degree & < $75,000	537	435,287	23.4%
≥ Bachelor's degree & ≥ $ 75,000	715	375,700	20.2%
Insurance [a]			
Yes	2248	1,590,538	85.6%
No	240	235,730	12.7%
Missing	41	31,803	1.7%
Housing Transition [b]			
Yes	405	412,473	22.2%
No	2048	1,386,572	74.6%
Missing	76	59,026	3.2%
Housing Security [c]			
Insecure	213	197,357	10.6%
Secure	2178	1,552,631	83.6%
Missing	138	108,083	5.8%
Lack of access to general healthcare [d]			
Yes	644	510,649	27.5%
No	1873	1,342,102	72.2%
Missing	12	5,320	0.3%
Lack of access to contraceptive healthcare [e]			
Yes	204	193,700	10.4%
No	2306	1,648,622	88.7%
Missing	19	15,749	0.9%
Ever had an abortion [f]			
Yes	192	142,619	15.0%
No	1,222	757,216	79.6%
Missing	63	51,569	5.4%

[a] Defined as having insurance for the previous 12 months

[b] Defined as having lived in their current home for the past 12 months

[c] Defined as having difficulty paying rent or mortgage within the past 12 months

[d] Defined as being unable to access healthcare for any reason in the past 12 months

[e] Defined as having experienced a delay or difficulty accessing contraceptive care in the past 12 months

[f] Only among respondents who ever reported being pregnant

the past 12 months had non-significant increased odds of ever having an abortion compared to respondents who did not report housing transition (uOR: 1.34; 95% CI: 0.79, 2.28; aOR: 1.46; 95% CI: 0.84, 2.55) (Table 2). People who were housing insecure in the past 12 months had non-significant higher odds of ever having an abortion compared to respondents who were housing stable, in both unadjusted and adjusted analyses (uOR: 1.67; 95% CI: 0.90, 3.09; aOR: 1.76; 95% CI: 0.93, 3.34) (Table 2).

Discussion

Over 10% of adult women of reproductive age in Ohio had experienced housing insecurity in the past 12 months. Housing insecurity was associated with increased odds of being unable to access general healthcare and experiencing delays and barriers to contraceptive care. Housing transition was also associated with these outcomes in the unadjusted models, but these associations had a smaller magnitude and were not consistently statistically significant after adjustment. Both housing insecurity and housing transition were associated with ever having an abortion, but these associations were not statistically significant.

These results are consistent with the literature, which demonstrates that homelessness and housing insecurity are associated with poor access and utilization of various types of healthcare (Baxter et al., 2019; Berkowitz et al., 2015; Kushel et al., 2006; Ma et al., 2008; Mari-Dell'Olmo et al., 2017; Reid et al., 2008). While studies of the relationship between housing insecurity and contraceptive care are limited, evidence that people experiencing homelessness want reproductive healthcare but rarely have access to it exists (Kennedy et al., 2014). Furthermore, housing insecure people may not have access to a wide range of contraception options; differences in contraceptive method utilization level off once cost is removed as a barrier (Gawron et al., 2020).

Lack of contraceptive access may be related to the finding that women experiencing housing insecurity were more likely to have had an abortion. Housing insecurity may have long-term consequences beyond barriers to accessing care; for example, unwanted pregnancy, which can have ripple effects across the life course. Specifically, individuals who are housing insecure may be at risk for unwanted pregnancy and want an abortion. Due to being housing insecure, individuals may be unable to obtain an abortion and therefore, may be at risk for long-term economic hardship (Foster et al., 2018). Future studies should examine relationships between abortion and contraception access for people experiencing homelessness and housing insecurity. The lack of statistical significance between housing instability and abortion utilization may stem from the relatively few individuals

Table 2 Associations between experiencing housing transition and housing insecurity in the past year and lack of access to general and contraceptive care and abortion utilization using data collected from a representative sample of Ohio women of reproductive age (18–44 years of age)

	Lack of access to general healthcare		Lack of access to contraceptive healthcare		Ever had an abortion [b]	
	Unadjusted OR (95% CI)	Adjusted [a] OR (95% CI)	Unadjusted OR (95% CI)	Adjusted [a] OR (95% CI)	Unadjusted OR (95% CI)	Adjusted [a] OR (95% CI)
Housing Transition						
No (Ref)	---	---	---	---	---	---
Yes	1.62 (1.21, 2.17)	1.31 (0.95, 1.82)	2.05 (1.34, 3.12)	1.38 (0.88, 2.16)	1.34 (0.79, 2.28)	1.46 (0.84, 2.55)
Housing Insecurity						
No (Ref)	---	---	---	---	---	---
Yes	2.59 (1.79, 3.75)	2.16 (1.45, 3.23)	1.87 (1.11, 3.13)	1.74 (1.00, 3.04)	1.67 (0.90, 3.09)	1.76 (0.93, 3.34)

[a] Adjusted for age, socioeconomic status, and health insurance coverage

[b] Only among respondents who ever reported being pregnant

who reported ever having an abortion. The lack of individuals reporting abortion could be due to two key reasons. First, abortion is highly stigmatized, and people are therefore less likely to report having had one (Sedgh & Keogh, 2019). Second, in Ohio, several laws have been enacted in the past several years to restrict abortion access, which has resulted in fewer people being able to obtain an abortion in Ohio (Norris et al., 2020). Interestingly, after adjustment, the association between housing instability and abortion utilization strengthened, suggesting housing instability and abortion utilization may be related. Future studies will need adequate sample size to investigate this relationship further.

The lack of significant association between housing transition and access to general and contraceptive healthcare is likely due to two factors: housing transition is a less severe form of housing insecurity (and thus adverse effects may be more moderate) (Appleby & Desai, 1987; Kushel et al., 2006), and, for some, housing transition may represent a positive life event (i.e. moving to more preferable housing). Although the measure of housing insecurity used in this analysis is consistent with established measures, it may not fully capture all dimensions of housing instability (Appleby & Desai, 1987; Kushel et al., 2006). Future analyses of the effects of housing insecurity on contraceptive and reproductive healthcare access should consider multidimensional measures of housing instability (i.e. rent/mortgage cost, number of individuals in the home).

These results indicate a need to address housing instability as an aspect of healthcare access. People who experience housing instability and other forms of insecurity (i.e. food insecurity, unemployment) (Dong et al., 2018) in the US may be delayed in accessing healthcare in part due to its high cost, lack of universal coverage, and administrative hurdles like address requirements. In this analysis, housing insecurity was associated with a lack of access to general healthcare, but we cannot determine the mechanism of this relationship. Furthermore, the reason for the potential relationship between housing insecurity and abortion utilization is also less clear. In both instances, these relationships may be mediated by financial hardship.

We are not aware of any contraceptive services that also address housing insecurity. Programs within hospital systems and public health departments that employ social workers to link individuals to a variety of services including healthcare and housing could be studied and improved to ensure reproductive health needs are also being met.

Our analysis is limited by several factors. First, given that the sample was representative of Ohio, and thus majority white, the sample did not permit an investigation of the impact of racism on the association between housing insecurity and healthcare. Racial disparities, due to racism, in housing are well known. Studies examining these disparities in relation to reproductive healthcare and impact-focused studies are needed. Additionally, because the survey was conducted only in English and Spanish, we likely missed underrepresented individuals who may experience additional barriers because they were prevented from participating in the survey because of the limited survey languages, which could further limit the generalizability of these findings. Second, these data are cross-sectional, and temporality cannot be inferred, which means that the lack of access to care could have preceded housing instability. Another temporality issue may arise from the outcome measures since the measure of abortion was ever while the general and reproductive healthcare were both in the past 12 months. This limitation can be overcome with longitudinal data. Third, individuals experiencing one form of material poverty often suffer from other forms as well (i.e., food

insecurity, unemployment) (Berkowitz et al., 2015). We attempted to account for additional material poverty via statistical adjustment for SES and health insurance coverage. After adjustment, housing insecurity was still associated with a lack of access to healthcare. Fourth, while we performed statistical adjustment, we cannot rule out potential residual confounding due to mismeasured covariates. For example, SES was imputed by NORC using broad categories and may not capture nuanced trends, especially at lower income levels. Additionally, health insurance as a binary variable (yes v no) may miss the differences between types of insurance (i.e., public versus private). Future studies should consider more robustly measured confounding variables. Fifth, we utilized a single question to assess housing insecurity and housing transition; therefore, these results may not fully capture the multidimensional nature of housing insecurity. However, these results do generally follow expected results based on previous findings that utilize more complex measures of housing instability. Sixth, because our sample methodology was based on addresses, our sample may underrepresent people at risk for housing instability. However, this sample methodology would be a more meaningful source of bias if we had focused on homelessness rather than housing instability. Housing-insecure individuals generally have an address and would be captured in this sample. Lastly, this survey included only participants who identified as women. However, self-identified women are not the only individuals in need of contraceptive and abortion care.

Conclusions

Over 10% of adult women of reproductive age in Ohio experience housing insecurity. Respondents experiencing housing insecurity had higher odds of experiencing a lack of access to general and contraceptive care. Although housing insecurity was significantly associated with these measures of healthcare access, housing transition was not. Housing stability should be considered when determining a person's ability to access and utilize general and reproductive healthcare and people who are housing insecure may need targeted interventions to ensure they are able to access healthcare. Broadly, policies seeking to improve access and utilization of healthcare should recognize that housing instability is a barrier to healthcare and include or actively refer to programs to increase access to stable housing.

Data Availability No data are available.

Code Availability Not available.

Declarations

Competing Interests None.

Ethics Approval This study was approved by University of Chicago's Institutional Review Board (Protocol #18.08.14). Our analysis was exempt from review by the Institutional Review Board at Ohio State University.

Consent to Participate All participants provided informed consent.

Consent to Publish Not Applicable.

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