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Food Insecurity Among Older Adults with a History of Incarceration

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Abstract

We examined the association between history of incarceration (HOI) and food insecurity (FI) among older adults using pooled data from 12,702 respondents aged 51+ who participated in the 2012 and 2014 waves of the Health and Retirement Study. In our sample, 12.8% of participants reported FI. Those with a HOI had an increased odds of FI (OR 1.83; 95% CI 1.52-2.21). Race/ethnicity moderated the association between HOI and FI. The positive and statistically significant association was concentrated among Non-Hispanic Black and Non-Hispanic White participants. No statistically significant association was found among Hispanic participants or among those from other racial/ethnic groups. Income, depressive symptoms, and functional limitations mediated the association between HOI and FI, with the largest indirect effects observed for income. FI is an important issue among older adults with a HOI. Programs and policy initiatives to increase food access and/or improve earnings in this population may be needed.

Keywords: food insecurity, incarceration, older adults, Health and Retirement Study, justice involvement

What the Paper Adds to Existing Literature:

- HOI has been linked to food insecurity in studies of the general population. However, this is the first study to evaluate the association between HOI and food insecurity using a population-based sample of older adults.
- This is also the first study to examine racial/ethnic differences in the association between HOI and food insecurity among older adults.

Applications of Study Findings:

- Identifying explanations for the association between food insecurity and HOI among older adults is crucial for identifying suitable interventions.
- Given that household income largely mediates the association between HOI and FI in this study, programs to increase income among formerly incarcerated older adults may be needed to reduce FI in this population.
- Non-Hispanic Black older adults with a HOI are particularly at risk of FI. Better linkages to existing food and meal programs may be needed in this population.

Introduction

Food insecurity (FI; i.e. the inability to access an appropriate quantity and quality of food to maintain a healthy lifestyle) is a growing problem among older adults. In the United States, one in twelve adults aged 50+ are food insecure. (Gunderson & Ziliak, 2021; Ziliak & Gunderson, 2021). Studies suggest that risk of FI among older adults may be attributed to chronic disease burden (Jih et al., 2018), functional limitations (Chang & Hickman, 2018), and residing in multigenerational households (Ziliak & Gunderson, 2016). FI is an important public health problem, as it is associated with greater risk of malnutrition and numerous chronic health conditions (Gunderson & Ziliak, 2015).

Previously incarcerated older adults may be particularly at risk of FI. Individuals with a history of incarceration (HOI) are more likely to have insufficient income, reducing the ability to access healthy food (Couloute & Kopf, 2018; Looney & Turner, 2018). Income is closely tied to employment, but as many as 60% of employers choose not to hire those with a HOI (Westrope 2018), leading to an unemployment rate of over 27% for this group (Couloute & Kopf, 2018). Employment discrimination not only decreases the chances of finding stable employment, but formerly incarcerated individuals who find employment earn 30% less than their counterparts without a HOI (Wildeman & Wang, 2017). This compounds with the age discrimination that older adults experience when looking for employment (Neumark et al., 2017), further increasing the risk of FI among older adults with a HOI. Additionally, jobs available to those with a HOI can be difficult for older adults to perform. For example, in 2010, 24% of the jobs held by individuals with a HOI were in physically demanding job areas like construction and manufacturing (Carson et al., 2021).

Justice system involvement among older adults has increased rapidly. From 1993 to 2013, the number of adults aged 55+ incarcerated in state prisons increased by 400%, likely due to an increase in conviction rates among older adults and the use of longer prison sentences as a strategy to promote public safety (Carson & Sabol, 2016). Additionally, there has been an increase in the number of older adults returning to community settings after incarceration, as states attempt to decarcerate older prisoners to reduce healthcare spending associated with caring for an older population (State Health Care Spending Project, 2013). Once released from prison, these older adults often face numerous challenges that increase their risk of FI, including homelessness (Couloute, 2018), unemployment, and poverty (Western & Sirois, 2019). Several studies conducted in younger samples (Testa & Fahmy, 2021; Testa & Jackson, 2019; Testa & Jackson, 2020a), in samples of pregnant women (Testa & Jackson, 2020b), and samples of children with parental HOI (Turney, 2015) suggest that incarceration is associated with increased risk of FI. These risk factors are likely magnified among older adults with a HOI, as they likely also face age-related barriers to employment (e.g., age discrimination; Harootyan, 2021) and mobility issues (Bjelland et al., 2010), that further increase their risk of FI.

Given that 95% of incarcerated individuals are eventually released (Hughes & Wilson, 2003), it is crucial to understand the health-related experiences of formerly incarcerated older adults after they reenter communities. While the association between previous incarceration and FI has been explored in younger adults (Testa & Fahmy, 2021; Testa & Jackson, 2019; Testa & Jackson, 2020a), there has been little attention to FI in older samples. This issue may be particularly relevant for adults over 50. Data from the U.S. Sentencing Commission (2017) show that 16.4% of those released from federal prison or onto probation are ages 50+ at the time of release. Further, there are lifetime consequences of incarceration, no matter how recent one's jail

or prison stay. For example, studies show that incarceration reduces a person's lifetime earnings between ten and forty percent (The Pew Charitable Trusts, 2010; Western, 2006). Additionally, individuals banned from receiving food assistance due to felony conviction are often banned for life, no matter how long-ago incarceration occurred (National Inventory of Collateral Consequences of Conviction, n.d.).

The purpose of this current study is to use a population-based sample of adults to examine the association between HOI and FI among community-dwelling older adults. We were also interested in whether race/ethnicity moderated the association between HOI and FI. There are large racial/ethnic disparities in FI among older adults. In 2020, nearly 20% of non-Hispanic Black adults aged 50 and older experienced FI, compared to only 5.2% of non-Hispanic White adults (Dean & Figueiredo, 2022). Bowen et al., (2021) suggest that racism is a fundamental cause of FI, as racism contributes to racial disparities in income and wealth, and because racism is linked to FI above and beyond socioeconomic status. Several studies have indicated that reports of lifetime racial discrimination are associated with greater severity of FI (Burke et al., 2018; Phojanakong, et al, 2019). Additionally, racism increases one's exposure to adverse life events linked to FI, such as job loss, housing instability, and mental institutionalization (Chilton et al., 2015; Jackson & Vaughn, 2017).

Additionally, Non-Hispanics Blacks are more likely to be incarcerated than non-Hispanic Whites. While non-Hispanic Blacks make up only 13.4% of the U.S. population (U.S. Census Bureau, 2019), they account for 38.1% of those currently incarcerated (Federal Bureau of Prisons, 2022). Compounding these issues, studies suggest that the collateral consequences of incarceration are particularly damaging for Black people. In two separate studies, Pager and colleagues observed that (among those with a history of justice system involvement) Black job

applicants were less likely to receive callbacks for employment than their White counterparts (Pager 2003; Pager 2009). Further, there is evidence that Black individuals with a history of justice system involvement face greater housing discrimination than similar White individuals. In an experimental study conducted by the Greater New Orleans Fair Housing Action Center (2015), researchers found that housing providers treated prospective applicants with criminal backgrounds differently based on the applicants' race, quoting more lenient background screening policies for White applicants, making more exceptions to established criminal background policies for White applicants, and offering White applicants more guidance on appealing negative criminal background decisions. Such racial differences in treatment have important implications for FI, given that both unemployment (Huang, 2016; Nord, 2014) and housing instability (Cohen et al., 2022; Yousefi-Rizi, 2021) are associated with increased risk of FI. Given these data, we would expect that non-Hispanic Blacks with a HOI would be at even greater risk of FI than other groups.

Finally, we explored factors that might mediate the association between HOI and FI. Several studies demonstrate that poverty is a predictor of FI. According to the U.S. Department of Agriculture, 29% of households under 185% of the federal poverty level are food insecure, compared to only 5% of households with incomes at higher levels (Coleman-Jensen et al., 2021). Likewise, studies by Goldberg & Mawn (2015) and Morrissey et al. (2016) found that as a family's poverty level increases, risk of FI also increases. Thus, we evaluated whether income mediated the association between HOI and FI.

Employment status has also been associated with FI. Coleman-Jensen (2011) found that households with heads who were unemployed, working part-time, or working multiple jobs, had greater odds of FI than households with heads working one full-time job. Likewise, several

students have found an association between unemployment and FI (Huang et al., 2015; Reeves et al., 2021). Given these known linkages between incarceration, unemployment, and FI, we tested the assumption that employment status would mediate the association between HOI and FI.

We also evaluated whether depressive symptoms mediated the association between HOI and FI. Numerous studies suggest that incarceration is associated with mood disorders, including major depression (Porter & DeMarco, 2019; Zhao, 2021). The isolation, confinement, and danger of the prison environment can have damaging long-term psychological consequences (Sykes, 2007). Further, after reentry, formerly incarcerated individuals often face job loss, homelessness (Bashir, 2021), and discrimination (Assari et al., 2018), all of which have been associated with depression. Further, several studies have found that depression is associated with increased risk of FI (Garg et al., 2015; Hanson & Olsen, 2012; Garg et al., 2015).

Finally, we evaluated whether functional limitations mediated the association between HOI and FI. There are several reasons why justice system involvement may lead to increased risk of functional limitations. While in custody, incarcerated individuals have few opportunities for exercise, as access to indoor/outdoor spaces is often restricted for security reasons (National Audit Office, 2006). Immediately after reentry, exercise and other forms of self-care may be less prioritized as individuals contend with unemployment, housing insecurity, and other issues that threaten basic survival. A few studies have documented an association between prior incarceration and functional limitations later in life. Using data from the National Longitudinal Survey of Youth, Schnittker & John (2007) found that a HOI was associated with greater risk of functional limitations over a 21-year period. In a more recent study using data from the Health and Retirement Study, Latham-Mintus and colleagues (2022) found that a HOI was associated with higher levels of functional limitation among adults aged >50. Several studies have linked

functional limitations to increase risk of FI (Brewer, 2010; Heflin et al., 2019), as they can impact one's ability to sustain employment and earn sufficient income (Coleman-Jensen, 2020). Additionally, increased health expenditures among those with disabilities increases the risk of FI by reducing household funds available for purchasing healthy foods (Coleman-Jensen, 2020).

To address our research questions, we used data from the Health and Retirement Study, a population-based survey of community-dwelling U.S. older adults aged >50.

Methods

Study Design

This is a cross-sectional analysis pooling de-identified, publicly available survey data from the 2012 and 2014 waves of the Health and Retirement Study (HRS), an ongoing national longitudinal study of older adults (Heeringa & Connor, 1995). The HRS uses a four-stage probability sampling design to recruit adults ages 51+, oversampling non-Hispanic Blacks, Hispanics, and Florida residents, details of which are described elsewhere (Heeringa & Connor, 1995). Spouses of selected individuals are enrolled as well, regardless of age. During each wave of the HRS, surveyors collect demographic, lifestyle, health, biological, psychosocial, and physical health data measures.

Assessment of Incarceration History

HOI was assessed via self-report in the 2012 and 2014 waves of the HRS. The item measuring HOI was included in the psychosocial leave behind questionnaire, which is administered to a random 50% of all HRS respondents. Fifty percent of HRS respondents received the psychosocial leave behind questionnaire in 2012 and the other 50% of respondents received the questionnaire in 2014. Participants were asked if they had previously been inmates in a jail or prison (yes/no).

Covariates

We adjusted for the following variables in our analyses: marital status (married, partnered, separated or divorced, widowed, never married), race/ethnicity (non-Hispanic White, non-Hispanic Black, non-Hispanic Other, Hispanic), gender (male/female), age (continuous variable), income (continuous variable), education (less than high school, GED, high school graduate, some college, college and above), and mother's years of education (continuous variable). All categorical variables were dummy coded.

Assessment of FI

During the 2012 and 2014 waves of the HRS, one member of each household was asked the following question on behalf of the entire household: *“In the last two years, did you ever not have enough money to buy the food you need (yes/no)?”* Households were considered food insecure if the household respondent responded “yes” to this question.

Sample Size

A total of 14,460 individuals completed the 2012 and 2014 HRS psychosocial leave behind questionnaires. We excluded 415 individuals aged <51, another 104 individuals who did not answer questions about FI or HOI, and an additional 1,239 individuals missing data on any of the covariates. The final sample included 12,702 participants aged 51 and older. Compared to those included in the sample, those excluded had lower income and less education. Further, they were more likely to be food insecure, Non-White, unmarried, and working less than full-time (Supplemental Table 1).

Analysis

We used multiple logistic regression to evaluate the association between HOI and household FI, adjusting for age, race/ethnicity, gender, education, marital status, and mother's

years of education. Associations were assessed using odds ratios (ORs) and 95% confidence intervals (CIs).

To determine if race/ethnicity moderated the association observed between HOI and FI, we used first-order cross product terms for HOI and our racial/ethnic categories. Interaction terms were entered into the regression equation with the corresponding main effects and control variables. To illustrate the nature of statistically significant interactions, we used the margins command in Stata (Williams, 2012) to calculate the probability of FI based on both HOI and racial/ethnic background.

To test for mediation, we used the Karlson–Holm–Breen (KHB) method (Kohler, 2011), a command in Stata that applies decomposition properties of linear models to the logit model. It decomposes the total effect of a key independent variable in a logistic regression model into the sum of the direct and indirect effects. In the mediation analysis for FI, HOI was defined as the key independent variable, and depressive symptoms (total CES-D score), functional limitations (number of ADLs), and participant income were entered as mediators. We calculated the mediated percentage, which is the percentage of the main association that can be explained by the mediator. The mediated percentage was considered significant when the total and indirect effects were significant. We entered each potential mediator into the model separately and then altogether. All models adjusted for our standard covariates. We used the disentangle option in Stata to determine the relative contribution of each of our potential mediators. All quantitative analyses were conducted using Stata/ SE 16.1 (StataCorp LLC, College Station, TX).

Results

Our final sample included 12,702 respondents (median age 68 years; range 51-104 years (Table 1). Of the total sample, 71.1% of respondents were non-Hispanic White, 15.2% were non-

Hispanic Black, 10.9% were Hispanic and 2.8% were of other racial/ethnic backgrounds. Sixty percent of respondents were married, 59% were female, and 85.8% had at least a high school education or equivalent. Twenty-three percent were working full-time, and 57% of respondents were retired. Of the total sample, 12.8% reported FI.

[Table 1 should be placed here.]

When entered into the logistic regression model simultaneously (Supplemental Table 2), the following covariates were related to *increased* risk of FI: female gender (OR=1.25; 95% CI: 1.10-1.42); non-Hispanic Black race/ethnicity (compared to non-Hispanic Whites; (OR=2.56; 95% CI: 2.23-2.94)); Hispanic ethnicity (OR=1.94; 95% CI: 1.62-2.34); other racial/ethnic group status (OR=1.74; 95% CI: 1.28-2.36); being partnered (compared to being married (OR=1.97; 95% CI: 1.56-2.48)); being separated or divorced (OR=2.56; 95% CI: 2.21-2.97); being widowed (OR=1.97; 95% CI: 1.65-2.34); never being married (OR=2.38; 95% CI: 1.90-2.99); having left high school (compared to those with at least a college degree; (OR=2.98; 95% CI: 2.41-3.67)); having a GED (OR=2.53; 95% CI: 1.94-3.28); being a high school graduate (OR=2.01; 95% CI: 1.68-2.41); and having some college (OR=1.56; 95% CI: 1.25-1.81). The following covariates were associated with *decreased* risk of FI: older age (OR=0.94; 95% CI: 0.94-0.95) and mother's years of education (OR=0.97; 95% CI: 0.95-0.99).

Seven percent (n=879) of respondents reported a HOI. In a logistic regression model including all the covariates, we found that HOI was associated with increased odds of FI (OR 1.83; 95% CI 1.52-2.21). (Figure 1).

[Figure 1 should be placed here.]

Race/ethnicity moderated the association between HOI and FI. We observed a significant interaction between Non-Hispanic Black ethnicity and HOI (reference group: Non-Hispanic White; Beta= -0.477; p=.02; Figure 2). The probability of FI among Non-Hispanic Whites was

7.2 out of 100 individuals for those without a HOI and 17.5 out of 100 individuals for those *with* a HOI. The probability of FI among Non-Hispanic Blacks *without* a HOI was 26.1 out of 100 individuals, and the probability of FI was highest among Non-Hispanic Blacks with a HOI (37.8 out of 100 individuals) There was no difference in the association between HOI and FI among Non-Hispanic Whites or non-Hispanics of other backgrounds.

[Figure 2 should be placed here.]

Finally, we were interested in factors that might mediate the association between HOI and FI. In mediation analyses, we observed that, collectively, household income, depressive symptoms, functional limitations, and employment status indirectly account for 37.89% of the total effect of HOI on FI. We found that substantial parts of that indirect effect were via household income (43.72%) depressive symptoms (37.55%), functional limitations (15.61%), and employment status (3.1%) while controlling for other covariates.

Discussion

This study examined the association between HOI and FI among U.S. community-dwelling older adults. Older adults with a HOI had 83% increased odds of household FI compared to those without a HOI. This was true even after adjusting for potential confounding factors. The findings from this study are consistent with findings from studies of households with young children (Cox & Wallace, 2016), recently incarcerated new parents (Testa & Fahmy, 2021), and young adults (Testa & Jackson, 2019).

Of our potential mediators, we found that household income had the most impact on the association between HOI and FI. It is well-documented that formerly incarcerated individuals earn less over their lifetimes than non-incarcerated individuals (Brennan Center for Justice, 2020). As formerly incarcerated individuals get older, there may be even fewer opportunities to

earn income, as older individuals are often less skilled in using technology and digital platforms (Hargittai, 2019; Hung, 2020), which are often associated with higher income jobs (Pew Research Center, 2021). Additionally, older previously incarcerated individuals may receive less social security income than their counterparts, as lower lifetime earnings also translate into lower social security benefits.

We also evaluated whether race/ethnicity moderated the association between HOI and FI. Our findings suggest that the impact of incarceration on FI is highest among Non-Hispanic Black individuals. This finding supports existing evidence that the collateral consequences of incarceration are particularly damaging for Black individuals (Greater New Orleans Fair Housing Action Center, 2015; Pager 2003; Pager, 2009). Non-Hispanic Blacks are often stigmatized in ways that inhibit their ability to enjoy social benefits and privileges that have implications for health (Bowen et al., 2021). Formerly incarcerated individuals also face stigma and discrimination after returning to community settings (see review by Feingold, 2021), which has implications for numerous health-related outcomes (Assari et al., 2018; Redmond et al, 2020; Turney et al., 2013). Formerly incarcerated Non-Hispanic Black older adults face double stigmatization as they navigate community spaces, which likely impacts their access to and utilization of community resources.

This study has several strengths. We utilized a large population-based sample of community-dwelling older adults with an oversampling of racial minorities, which allowed us to evaluate racial/ethnic differences in the association between HOI and FI. Additionally, the HRS includes comprehensive demographic and economic data, which allowed us to explore these factors as mediators.

This study is not without limitations. Due to the cross-sectional nature of this study, causality cannot be inferred. Further, we did not have detailed data on incarceration history, including information on length of incarceration, age at release, time elapsed since incarceration, or sentence type, (e.g. misdemeanor versus felony). All these variables may moderate the association between incarceration and FI or explain observed racial/ethnic differences. Further, our measure of FI was a binary measure that did not capture the severity or duration of FI. Additionally, FI was measured over a 2-year period in our study, whereas, it is generally measured over a one-year period. (Economic Research Service, 2022). We also could not account for past exposures that might confound the association between history of incarceration and food insecurity in our study. For example, individuals with a history of adverse childhood experiences (including parental history of incarceration) have greater risk of food insecurity in adulthood (Jackson et al., 2017; Jackson et al., 2019; Turney, 2015). Finally, although we only observed a statistically significant interaction between Non-Hispanic Black ethnicity and HOI in predicting FI, this is likely due to sample size issues in the other groups. Despite these limitations, to the authors' knowledge, this is the first study that describes the association between FI and HOI using a population-based sample of older adults.

Our work has important implications for health promotion and public policy. There are numerous food assistance programs designed to decrease FI that are available to low-income community-dwelling older adults, including The Supplemental Nutrition Assistance Program (SNAP), Meals on Wheels (Meals on Wheels America, 2019), The Commodity Supplemental Food Program (Food and Nutrition Service, 2019), The Emergency Food Assistance Program (U.S. Department of Agriculture, 2013), and the Senior Farmers' Market Nutrition Program (U.S. Department of Agriculture, 2022). These programs, however, are underutilized, especially

in minority and rural populations (Lauffer & Vigil, 2021). Efforts to link formerly incarcerated older adults to these resources may be needed. Further, the collection of qualitative data from formerly incarcerated older adults would be useful for understanding any structural barriers that may impact food access and underutilization of food assistance programs in this population. Such information is crucial for designing effective programs and interventions. Additionally, policy initiatives may be needed to expand opportunities for higher income in this population. This could include reducing restrictions on employment in fields associated with higher income, or the provision of additional income assistance to formerly incarcerated older adults who may not be able to work due to old age or disability. Such initiatives could help to reduce FI in this population.

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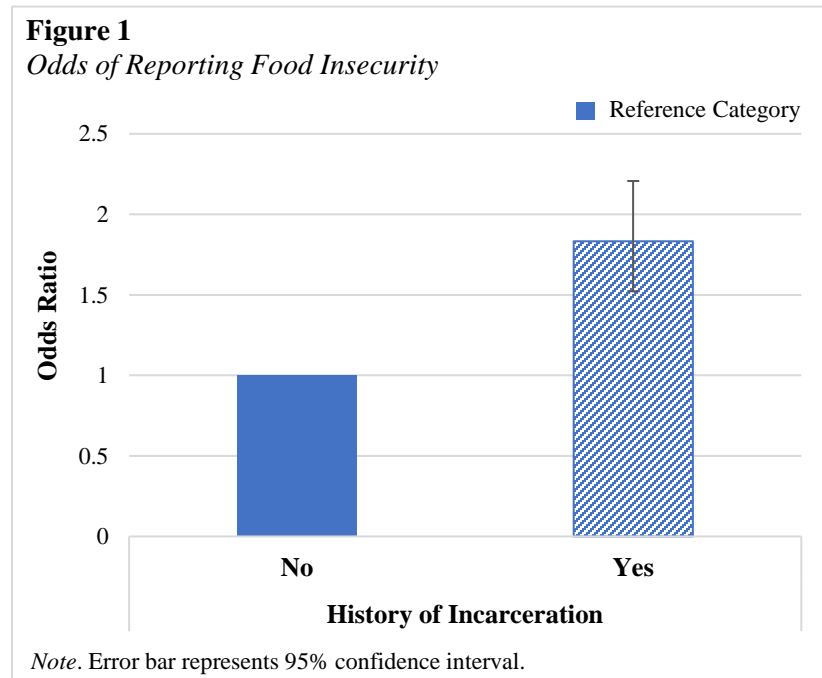
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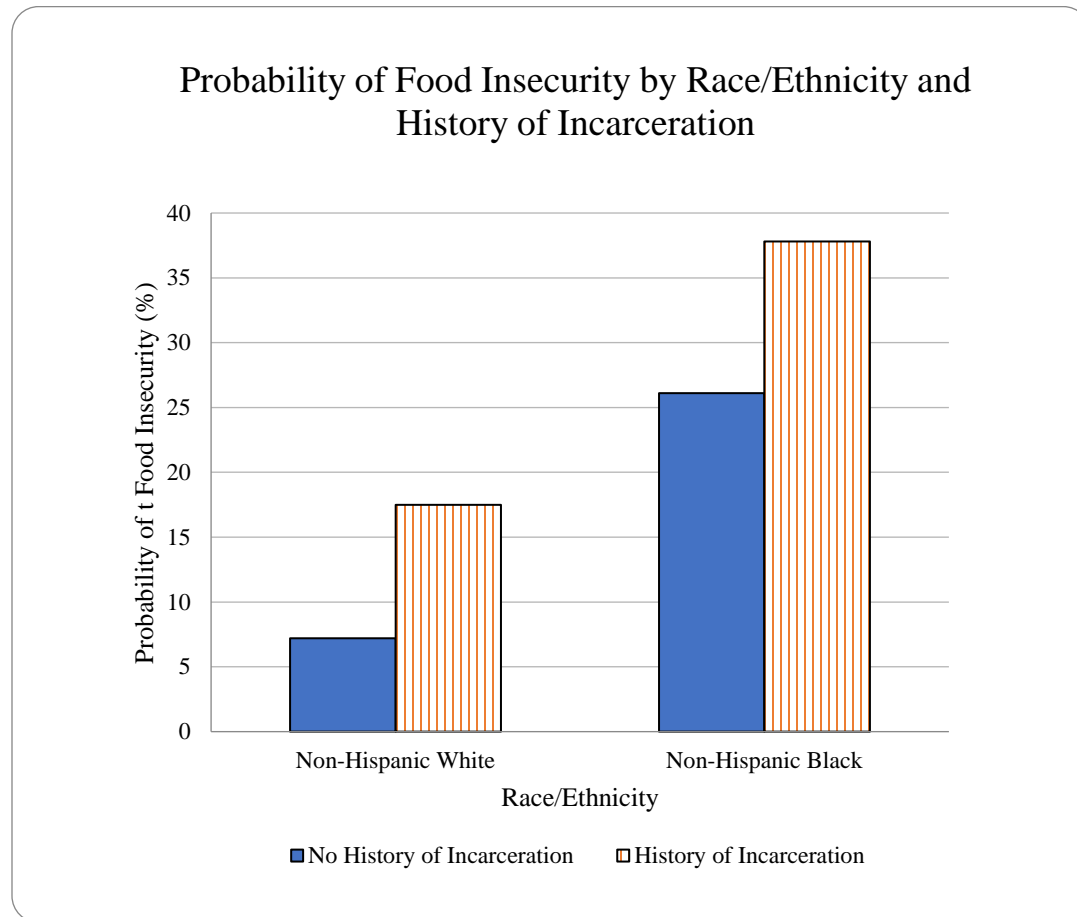
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Table 1. Demographic Characteristics of the Study Sample (<i>n</i> = 12,702)				
Variable	Overall	History of Incarceration		p-value
		Yes	No	
% Food Insecure	12.8	27.6	11.7	<.001
Gender				
% Female	59.4	21.5	62.2	<.001
% Male	40.6	78.5	37.8	
Race/Ethnicity				
% Non-Hispanic White	71.1	53.8	72.4	<.001
% Non-Hispanic Black	15.2	28.6	14.2	
% Non-Hispanic Other	2.8	3.8	2.8	
% Hispanic	10.9	13.9	10.7	
Marital Status				
% Married	60.2	51.2	60.8	<.001
% Partnered	4.6	13.0	3.9	
% Separated or Divorced	13.1	21.4	12.5	
% Widowed	17.8	6.9	18.6	
% Never Married	4.4	7.5	4.1	
Education				
% Less Than High School	14.2	21.6	13.6	<.001
% GED	4.8	11.3	4.4	
% High School Graduate	29.5	23.4	29.9	
% Some College	26.1	29.2	25.9	
% College and Above	25.4	14.4	26.2	
Employment Status				
% Works Full-Time	22.9	26.6	22.6	<.001
% Works Part-Time	4.9	5.2	4.9	
% Unemployed	2.3	5.5	2.1	
% Partially Retired	8.4	6.8	8.5	
% Retired	56.7	50.9	57.1	
% Disabled	1.5	3.1	1.4	
% Not in Labor Force	3.3	1.9	3.4	
Maternal Education (Years)				
Mean (SD)	10.0 (3.7)	9.8 (3.9)	10.0 (3.7)	.088
Median (Range)	12 (0-17)	12 (0-17)	12 (0; 17)	.003
Age, Years				
Mean (SD)	68.4 (10.3)	63.4 (8.7)	68.8 (10.3)	<.001
Median (Range)	68 (51-104)	61 (51-93)	69 (51-104)	<.001
Annual Income, U.S. Dollars				
Mean (SD)	16,206.50 (41,632.80)	13,693.29 (29,513.04)	16,393.35 (42,390.70)	.064
Median (Range)	0 (0-1,053,000)	0 (0-320,000)	0 (0-1,053,000)	.171



Model adjusted for gender, race/ethnicity, marital status, education, age, and mother's years of education.

Figure 2. Probability of Food Insecurity by Race/Ethnicity and History of Incarceration



Model adjusted for age, gender, marital status, education, and mother's years of education.