



# Fear of Job Loss and Hypertension Prevalence Among Working Latino Adults

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## Abstract

Evidence indicates that stress increases cardiovascular disease risk. Latinos are disproportionately employed in precarious work conditions that can trigger hypertension risk. We examined if fear of job loss, a work stressor, was associated with hypertension among U.S. Latinos. We utilized 2015 National Health Interview Survey data from working Latino adults ( $n = 2683$ ). In multivariate logistic regression models, we examined if fear of job loss was associated with hypertension, adjusting for age, sex, education, household income, and health insurance, and whether nativity status modified this relationship. Fear of job loss was significantly associated with increased probability of reporting hypertension among Latino workers in fully adjusted models (PR 1.55, 95% CI 1.18–2.03), compared with no fear of job loss. This relationship varied by nativity. These findings suggest that work-related conditions may contribute to cardiovascular disease risk among Latinos and public health initiatives should promote behavioral interventions in work settings.

**Keywords** Latinos · Hypertension · Precarious employment · Nativity · Stress · Work conditions · Job insecurity · Fear of job loss

## Introduction

Hypertension is a leading cardiovascular disease risk factor in the United States (U.S.) [1]. Approximately 1 in 3 adults (29%) has high blood pressure [1] and Hispanics/Latinos/Latinx (herein Latinos or Latinx) are more likely to die from hypertension-related complications than their Non-Latino white peers [2, 3]. Latinx currently make up 17.7% of the U.S. population [3] and this estimate is projected to increase to nearly 30% by 2050 [4], making the

identification of cardiovascular disease risk factors crucial for this population.

Around the globe, work is considered a fundamental cause of health outcomes, especially chronic conditions [5, 6]. In the United Kingdom, the Whitehall II study with British civil servants was one of the first studies to establish a robust relationship between job stress and cardiovascular mortality and morbidity [7]. In the U.S., there is a smaller

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body of research on this topic and the studies that have been conducted tend to either focus on hazardous work conditions or consider broad occupational categories or employment status [8]. However, as Ahonen et al. (2019) have argued, these categories do not adequately capture the effects of work on health [6]. These authors define work conditions as the circumstances under which people perform their jobs and include how work is organized and expected [6]. When conceptualized this way, studies on U.S. populations have shown that specific work conditions, such as work stressors, can influence the development of cardiovascular disease [7, 9].

There is an urgent need to examine work stressors in studies on Latino health given that this group is expected to have the most labor force growth over the next 10 years [10]. By 2028, it is projected that the number of Latinos in the U.S. workforce will increase by 7.4 million [10], which is consistent with past trends. Between 1966 and 2013, for example, Latino participation in the labor force increased from 2.5 to 13.9% [11]. Nearly half (47.9%) of the foreign-born U.S. labor force is Latino, while only 10.7% of U.S. born workers are of Latino origin [12]. Despite workforce participation growth and increased risk of hypertension-related mortality among this population, the role of work conditions in shaping the cardiovascular health of Latinx continues to receive little attention in the literature [13, 14]. The relationship between mental stress and incident hypertension has been established in the literature [15], but these studies have generally been conducted abroad and did not include Latinos.

In the U.S., job characteristics, such as decision latitude, which is considered a work stress variable, have been linked to differences in hypertension prevalence among workers, including Latinos [13]. Previous research has also indicated that job insecurity, also a work stressor, is linked to diabetes [14]. Research is lacking on the relationship between job insecurity and hypertension prevalence, especially among U.S. Latino adult workers. An estimated 1 in 10 workers is subcontracted, temporary, on-call, on-demand, or freelance [16]. These forms of precarious employment, where the worker believes unemployment may be imminent within a year, contribute to stress and have been linked to poor health outcomes [17]. Latinx are over-represented in precarious work: while they represent 16.6% of all U.S. workers, they make up 25.4% of temporary help agency workers [18]. Latino workers experience higher occupational mortality rates compared to all other workers (5.9 per 100,000 full-time-equivalent workers [FTEs] vs. 4.0 per 100,000 FTEs, respectively) and the difference is wider when considering nativity status (5.9 for foreign-born Hispanic workers compared to a rate of 3.5 for U.S.-born Hispanic workers) [19, 20]. The effect of stress was absent from these studies. Instead, researchers have attributed these differences in morbidity and mortality to over-representation in high risk jobs [21], a lack of education, and ignorance of safety procedures

[22]. The lack of research on the health-enhancing and -damaging effects of work that focuses on Latinos is concerning.

Several studies have highlighted the association of perceived job insecurity and cardiovascular disease risk factors, but these studies have focused primarily on the overall population and they have not accounted for social factors important to Latinx [23–26]. Although prior research has found that nativity and acculturation-related processes are associated with hypertension [27, 28], little research exists examining how work influences hypertension risk among Latinx. Compared to foreign-born Latinx, those born in the U.S. have a 40% higher hypertension prevalence [3]. While this hypertension disparity is likely due to the higher obesity and smoking prevalence (30% and 72%, respectively) observed among U.S.-born individuals compared to those that are foreign-born [3], work conditions are a critical factor to consider in studies on the social production of disease.

In the present study, we examine if fear of job loss, as a work stressor, is associated with self-reported hypertension among Latinos participating in a large, population-based survey and examine differences by nativity status. We hypothesized that fear of job loss would be associated with hypertension prevalence overall among Latino workers and more strongly among foreign-born individuals compared to their U.S.-born counterparts. Our study responds to the need to integrate work as a social determinant in health equity research [6] and promotes understanding of potential policy and program initiatives to create healthier work environments.

## Methods

### Data Source

The study population included participants from the 2015 National Health Interview Survey (NHIS) [29], which employs a multistage probability survey design to obtain a sample that is nationally representative of the US non-institutionalized civilian population. The 2015 survey included a supplement on occupational exposures that is not available for any other year. NHIS is a cross-sectional household interview survey administered by the Centers for Disease Control and Prevention (CDC). NHIS collects a broad range of data on health topics, which is used to characterize health problems, determine barriers to accessing and using appropriate health care, and evaluate federal health programs. The survey is designed to assess progress towards achieving national health objectives [29].

## Sample Population

A total of 33,672 sample adults were included in the 2015 survey. A total of 4190 individuals who self-identified as Latinx adults 18 years and older comprised our initial study population. To limit our sample to working Latinx adults, we removed those who reported not having a job in the previous 12 months, those who reported never having worked, those who refused to answer the question, and those who responded that they did not know ( $n = 1507$ ). Our final sample consisted of 2683 working Latinx adults.

## Study Variables

Our primary dependent variable was hypertension, which we treated as a binary outcome. Participants were asked, “Have you EVER been told by a doctor or other health professional that you had hypertension, also called high blood pressure?” Our primary exposure variable was fear of job loss. Sample adults who were 18 years of age and older and currently employed were asked if they were worried about losing their current/main job. Models were adjusted for demographic characteristics, including sex at birth (male/female) and age (18–24, 25–44, 45–64, and 65+). Additional covariates included education (high school degree or less vs. some college or more) health insurance (private, public, other, and uninsured), and household income (\$0–\$34,999, \$35,000–\$74,999, \$75,000+). Nativity status was classified as born in the U.S. or foreign-born. Covariates were entered in final models based on theoretical considerations as potential confounders. Well established behavioral risk factors for hypertension were also included as potential mediators: body mass index (BMI) (healthy weight, overweight, and obese) and smoking status (current smoker, former smoker, and never smoked).

## Statistical Analysis

Descriptive statistics included frequencies and weighted percentages by total sample and then nativity status. We fit logistic regression models to calculate prevalence ratios (PRs) assessing the association between fear of job loss and hypertension. Fully adjusted models controlled for age, sex, education, health insurance, household income, and nativity status. Models also tested if BMI and smoking mediated the relationship between fear of job loss and hypertension. We explored mediation effects by fitting fully adjusted models without the potential mediator and then entering the potential mediator to examine changes in estimates. We also repeated the logistic regression models to test for effect modification by nativity and length of time in the U.S. However, we eliminated stratification by length of time in the U.S. because the most acculturated group (foreign-born,

living in the U.S. for less than 10 years) had too few participants to yield stable confidence intervals. For all models, sample probability weights provided by NHIS were applied and confidence intervals were set to 95%. All analyses were conducted utilizing SAS, version 9.4, and SAS-callable SUDAAN, version 11.0.3 (SAS Institute, Cary, NC). Institutional Review Board approval was not required for this study because data were deidentified by NHIS and publicly available.

## Results

Weighted characteristics for the study sample are presented in Table 1. Nearly 70% of study participants were less than 44 years of age. Women represented 40% of the sample. Approximately one-third (36.4%) of participants had a high school diploma or fewer years of education. Nearly half of the study population had private insurance (48%) while roughly 30% were uninsured. Household income varied with 40% of the participants reporting income less than \$34,999, nearly 40% reporting income between \$35,000 and \$74,999, and 21% reporting income greater than \$75,000. More participants were overweight (40%) than healthy weight (26%) and about one-third were obese (34.5%). Most participants had never smoked (75%). Foreign-born working Latino adults were more likely to be worried about job loss compared to their U.S.-born counterparts (18.3% vs. 11.2%, respectively) and slightly more likely to report hypertension (18% vs. 16.6%), respectively. When the study population was examined by nativity status, the foreign-born were on average older, less educated, uninsured, and lower income. While more U.S.-born working Latino adults were of a healthy weight than those who were foreign-born, the latter less frequently reported obesity. Percentages of smokers and non-smokers were similar, regardless of nativity status. Among both U.S. and foreign-born Latinx workers, the percentage of those worried about job loss was highest among 25–44 year olds (Fig. 1). The percentage of those aged 45–64 years old concerned about job loss was higher among the foreign-born than the U.S.-born (Fig. 1). The opposite trend was observed for the youngest Latinx workers. The percentage of U.S.-born Latinx workers aged 18–24 who were worried about losing their current job was higher than their foreign-born counterparts (Fig. 1). A similar analysis of fear of job loss by nativity status found no difference by sex (not shown).

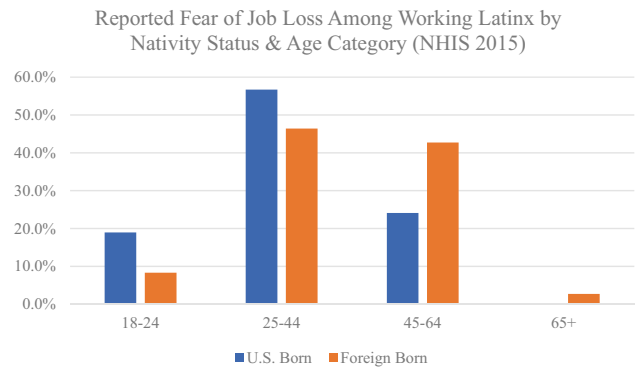
Table 2 presents crude and adjusted models for the association of fear of job loss and self-reported hypertension status. Respondents who reported fear of job loss were more likely to report hypertension in crude and fully adjusted models and the results were statistically

**Table 1** Weighted characteristics of working Latino adults with self-reported hypertension by nativity status, NHIS (2015)

	Total population (N = 2683) N (%)	U.S.-born (N = 1006) N (%)	Foreign-born (N = 1676) N (%)
<b>Age</b>			
18–24	440 (20.6)	313 (36.6)	127 (10.0)
25–44	1363 (47.9)	467 (43.4)	896 (50.9)
45–64	799 (29.5)	199 (18.2)	600 (37.0)
65 and older	80 (1.9)	27 (1.8)	53 (2.1)
<b>Sex at birth</b>			
Male	1444 (59.9)	510 (56.6)	934 (62.1)
Female	1238 (40.1)	496 (43.4)	742 (37.9)
<b>Education level</b>			
H.S. graduate and below	1080 (36.4)	193 (15.8)	887 (50.0)
Some college or more	1602 (63.6)	813 (84.2)	789 (50.0)
<b>Health Insurance</b>			
Private insurance	1160 (48.0)	539 (59.9)	621 (40.9)
Public insurance	527 (18.5)	215 (19.7)	312 (17.2)
Other	56 (1.4)	27 (1.2)	29 (1.3)
Uninsured	919 (32.1)	213 (19.1)	706 (40.6)
<b>Household income</b>			
\$0–\$34,999	1274 (40.2)	409 (31.9)	865 (45.6)
\$35,000–\$74,999	841 (38.5)	325 (37.9)	516 (38.9)
\$75,000+	340 (21.3)	188 (30.1)	152 (15.5)
<b>Body Mass Index</b>			
Healthy weight	679 (25.8)	269 (27.0)	410 (24.9)
Overweight	1005 (39.8)	314 (33.2)	691 (44.1)
Obese	878 (34.5)	384 (39.8)	494(31.0)
<b>Smoking status</b>			
Current smoker	352 (11.7)	171 (14.5)	181 (9.9)
Former smoker	346 (13.3)	137 (12.9)	209 (13.5)
Never smoked	1978 (75.0)	695 (72.6)	1283 (76.6)
<b>Worries about job loss</b>			
Yes	388 (15.5)	95 (11.2)	293 (18.3)
No	2001 (84.5)	781 (88.8)	1220 (81.7)
<b>Hypertension</b>			
Yes	485 (17.4)	182 (16.6)	303 (18.0)
No	2192 (82.6)	823 (83.4)	1369 (82.0)

\*Subtotals may not add up to 100 because of missing values

significant [adjusted prevalence ratio (aPR) 1.55; 95% confidence interval (CI) 1.18, 2.03]. Table 3 presents crude and adjusted models for the associations between fear of job loss and hypertension status stratified by nativity status as an acculturation proxy. In both crude and adjusted models, respondents who reported fear of job loss were more likely to report hypertension than those with no fear of job loss. However, these associations were only statistically



**Fig. 1** Latinx Adults and Fear of Job Loss by Nativity Status and Age Category (NHIS 2015)

**Table 2** Prevalence ratios for fear of job loss and self-reported hypertension among working Latinos, NHIS (2015)

	Model 1 <sup>a</sup>	Model 2 <sup>b</sup>	Model 3 <sup>c</sup>
	PR (95% CI)	aPR (95% CI)	aPR (95% CI)
Fear of job loss	<b>1.73 (1.32, 2.27)</b>	<b>1.49 (1.15, 1.94)</b>	<b>1.55 (1.18, 2.03)</b>
No fear of job loss	1.00 Referent	1.00 Referent	1.00 Referent

Bold values are statistically significant (P < 0.05)

<sup>a</sup>Model 1 represents the crude model

<sup>b</sup>Model 2 controls for age and sex

<sup>c</sup>Model 3 includes model 2 covariates and adjusts for education, household income, health insurance, and nativity

aPR indicates adjusted prevalence ratio, CI confidence interval, PR prevalence ratio

significant for foreign-born working Latino adults (aPR 1.73; 95% CI 1.27, 2.37). While BMI and smoking are known risk factors for hypertension, models that tested for mediation (data not shown) did not show substantive changes in effect estimates.

## Discussion

We found that fear of job loss was higher among foreign-born Latino workers compared to their U.S.-born counterparts. We also showed that fear of job loss was associated with higher prevalence of hypertension among Latino workers compared to those that did not experience this work stressor and this relationship remained when adjusting for demographic factors, socioeconomic position, and nativity. Over the past two decades, occupational health experts have spearheaded advocacy efforts to include the role of work in cardiovascular health outcomes research. In 2006, Lipscomb and colleagues argued that an analysis of

**Table 3** Prevalence ratios for fear of job loss and self-reported hypertension among working Latinos stratified by nativity status, NHIS (2015)

	Model 1 <sup>a</sup> PR (95% CI)	Model 2 <sup>b</sup> aPR (95% CI)	Model 3 <sup>c</sup> aPR (95% CI)
U.S.-born			
Fear of job loss	1.45 (0.86, 2.42)	1.22 (0.73, 2.02)	1.31 (0.80, 2.15)
No fear of job loss	1.00 Referent	1.00 Referent	1.00 Referent
Foreign-born			
Fear of job loss	<b>1.88 (1.37, 2.59)</b>	<b>1.72 (1.27, 2.31)</b>	<b>1.73 (1.27, 2.37)</b>
No fear of job loss	1.00 Referent	1.00 Referent	1.00 Referent

Bold values are statistically significant ( $P < 0.05$ )

<sup>a</sup>Model 1 represents the crude model

<sup>b</sup>Model 2 controls for age and sex

<sup>c</sup>Model 3 includes model 2 covariates and adjusts for education, household income, and health insurance

aPR indicates adjusted prevalence ratio, CI confidence interval, PR prevalence ratio

health disparities research with U.S. populations is incomplete if it does not consider work conditions [6]. Several researchers have investigated the relationship between perceived job insecurity and health risk factors [24, 30, 31]. Khubchandani and Price (2017) similarly utilized NHIS (2015) data to explore the relationship between reported job insecurity and found significantly higher odds of being obese, sleeping less than 6 hours a day, smoking every day, having work loss days greater than two weeks, and poor general health [24]. While these researchers agree that this topic has not been well studied in U.S. populations, they do not highlight differences by racial and ethnic groups or the effect of additional cultural factors, such as nativity status. To our knowledge, this is the first study to examine the relationship between fear of job loss and self-reported hypertension in a nationally representative sample of working Latino adults. Exploratory models that included health behaviors for hypertension outcomes, specifically smoking and unhealthy weight, did not mediate this association. This null finding of smoking and healthy weight not mediating this relationship is important, potentially indicating that work contexts are critical to reducing cardiovascular disease risk, especially for Latinx over-represented in precarious employment.

We additionally found that nativity status modified the relationship between fear of job loss and self-reported hypertension outcomes. Among the foreign-born, the prevalence of hypertension was nearly double for those who were worried about losing their current employment compared to

those who did not experience this stress (PR 1.88; 95% CI 1.37, 2.59). This relationship was only slightly attenuated in fully adjusted models and remained statistically significant. The trend was similar for U.S.-born workers, but interestingly the association was not statistically significant in crude or adjusted models. The effect of nativity status on job insecurity and hypertension was masked in our original model (Table 2). Had we not tested for effect modification, we may have erroneously concluded that this association was significant for all working Latinx adults, when in actuality it was only statistically significant for foreign-born Latinx workers. One possible explanation may be tied to employment benefits, such as eligibility for unemployment insurance and public health insurance. Some U.S.-born workers may benefit from these safety net programs at greater proportions compared to foreign-born Latinx workers, especially those unauthorized to work in the U.S. In our sample, the percentage of foreign-born Latinx workers that were uninsured was double the percentage of uninsured U.S.-born Latinx workers (Table 1). Unemployment benefits and the possibility of affordable or government sponsored health insurance may be protective for U.S.-born Latinx workers. Unfortunately, little to no research has been conducted on the effect of unemployment benefits on perceived job insecurity and health outcomes. Recently, Raifman et al. (2021) investigated the association between unemployment insurance and food insecurity during the COVID-19 pandemic in the U.S., when an additional \$600 per week in federal government sponsorship was granted to eligible participants [32]. Researchers reported reduced food insecurity for those who had access to this benefit, but they did not test for the effect of this benefit on psychosocial stress or the effect of not having access to this benefit among the ineligible. Research conducted outside of the U.S. examined the relationship between cognitive job insecurity (perceived job loss) and employment security (possibilities of finding an equal or better job) and reported an interaction whereby the absence of job security compounds affective job insecurity (worrying about losing one's job) [33]. Income security additionally affected this relationship. Future studies focused on foreign-born workers should also adjust for the effect of fear of deportation among this population. Fear of immigration enforcement has been linked to a delay in seeking preventive healthcare in a number of studies [34–36]. Our study included both U.S.-born and foreign-born Latino workers so we could not account for fear of deportation as a potential confounder. However, these additional psychosocial factors related to work contexts, as well as the perceived security of employment-attached benefits available in the U.S., warrant further investigation, especially since psychosocial stress has been well-documented in the literature as a risk factor for cardiovascular health outcomes.



## Limitations

Our study had several limitations that should be considered. Our sample was restricted to the 2015 NHIS survey year since this is the only year that NHIS collected data on work conditions. Although we had a sample of more than 4000 participants, we were not able to stratify by ethnic subgroup, e.g., Mexican, Puerto Rican, Cuban, etc., to determine differences in report of fear of job loss and its association with hypertension. This is especially important to consider given differences in citizenship status (e.g. Puerto Ricans are U.S. citizens) and the role that citizenship plays in placing individuals in specific work conditions. We also only measured report of fear of job loss, but not what generated this fear or other specific work conditions that may further contribute to the development of chronic health conditions, e.g. shift work, multiple jobs, harassment, etc. Additional limitations are attributable to the data source. NHIS is cross-sectional in design, which limits our ability to determine if fear of job loss was prospectively associated with the development of hypertension. Lastly, hypertension status was based on self-report in NHIS and thus assuming non-differential bias, the true estimate may be underestimated.

## Conclusion

Our study highlights the need for additional research on the role of work in population health. Fear of job loss is a social determinant of health that is additionally categorized as employment precariousness [17]. High levels of job insecurity accompanied by an overall erosion of workers' employment and working conditions is a contributor to population health and health inequalities [17]. In the U.S., health insurance is overwhelmingly employment-based, further threatening the health and well-being of unemployed Latinx workers. Hypertension is a biological expression of social, behavioral, and environmental influences and fear of job loss presents the potential for an especially health-damaging context. Given the increasing anti-immigrant climate facing Latinx communities in the U.S., our findings highlight the need for policies that create inclusive and safe work environments.

Work is a distal, multi-faceted, and complex causal component that warrants further research [6]. The difficulty modeling presents precludes researchers from including work conditions in studies based on the social production of disease, and the interrelatedness of social and physical health. This work is an introductory exploration of a key relationship between work-related stress and chronic disease, in the hopes that researchers will begin to think critically and include variables such as social determinants in their pursuit

to reduce health disparities experienced by vulnerable populations employed in insecure work contexts.

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**Author Contributions** Conceptualization: TG, OI and SE; Methodology: TG and SE; Formal analysis and investigation: TG and SE; Writing—original draft preparation: TG, OI, and JS; Writing—review and editing: TG, SE, RM, and EV; Supervision: SE. All authors have reviewed the submitted manuscript and approve the manuscript for submission.

**Data Availability** The National Health Interview Survey data (2015) utilized in this study was made available to the public by the Centers for Disease Control and Prevention.

## Declarations

**Conflict of interest** None of the contributors to this study have a conflict of interest to report.

**IRB/REC Approval** The current study was exempt from excluded from blind manuscript approval because the data were de-identified by NHIS and are publicly available.

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