

Significant Associative Factors for Hypertension Among New US Immigrants: An exploration of the 2003 New Immigrant Survey (NIS) Data

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Abstract

Background: Immigrants make up a large number of the US population and are at risk for poor health outcomes such as hypertension, a major public health concern. Little is known about the associating factors of hypertension among recent US immigrants.

Method: Using the New Immigrant Survey (NIS) data with a subsample of 7539, we attempt to address this gap. We ran descriptive statistics and multivariate analysis to analyze the data using covariates including age, education, gender, age, weight, and smoking, with hypertension as the outcome variable.

Results: Only 10% of our sample had hypertension. Controlling for other factors, employed participants had lower odds of hypertension (OR=0.77, 95% CI=0.60, 0.99). Length of stay was associated with increased odds of hypertension (OR=1.01, 95% CI =1.00-1.02). Additional factors increasing odds of hypertension included women (OR=1.52, 95% CI=1.24-1.86), older age (OR=1.08, 95% CI=1.07-1.09), and body weight (OR=1.01, 95% CI=1.01-1.02).

Conclusion: This study accentuates the underreporting of hypertension among immigrant populations. The findings also indicate the need for nurses and other health providers to develop systems of care that are sensitive to the unique needs of this population. More studies are needed to explore the extent to which those associative factors identified impact hypertension development and management among new immigrants.

Keywords: Hypertension; US immigrants; New immigrant survey

Introduction

Hypertension, a major risk factor for cardiovascular disease, has been recognized as a major public and global health affecting 30% of the US adult population and 1 billion individuals worldwide [1]. Hypertension contributes to over 7.1 million deaths per year [2]. Ethnic differences on the prevalence of hypertension have been explored among US born Blacks, non-Hispanic Whites, Hispanics, and Asians [3]. More studies are needed to understand hypertension as a health concern and its associative factors among new immigrants in the United States.

Immigrants are a growing sector of the US population, numbering at nearly 40 million in 2010 [4] and 41.3 million in 2013 [5]. The US has witnessed a 57% increase in immigrant populations between 1990 and 2000. Immigration is the largest contributing factor in US population growth, with more than 2.25 million individuals entering the country annually. [6]. Within the last decade, immigrants and their

children accounted for over 60% of US population growth [7]. In 2013, together with their children, U.S. immigrants made up 80 million individuals in the US [5]. In addition to their complex migration trajectory, immigrants experience a myriad of health issues including chronic diseases such as hypertension and diabetes. The fact that foreign born individuals currently make up such a large portion of the population and are expected to continue to grow in numbers warrants the need to explore and address their health concerns such as hypertension.

Fang et al. [8] utilized the National Health Interview Survey to explore the association of birth place and self-reported hypertension among foreign born individuals categorized into nativity regions of Europe, Asia, Africa, and Central/South Africa. Their findings indicated that US-born adults had a higher prevalence of hypertension than foreign born adults [8]. They also found that the risk for developing hypertension increased with the number of years of residency. The longer an individual resides in the U.S. the more acculturated they become, which can lead to changes in diet, social and

family dynamics and overall stress levels [8]. They also noted the need for more exploration on hypertension among foreign born individuals. There is a lack of knowledge on the associative factors that may impact hypertension among immigrants. In the current study we explored the factors associated with hypertension among a group of new US immigrants.

Methods

The New Immigrant Survey is a nationally representative multi-cohort study of new legal immigrants and their children to the United States based on nationally representative sample of the administrative records compiled by the U.S. Immigrant and Naturalization Service. These analyses use the data of the first full cohort sampled immigrants between May and November of 2003, and surveyed June 2003-June 2004. The survey response rate was 69%. The NIS included immigrants from a variety of backgrounds. However, only respondents for whom their last move was to the United States were included.

The sample was drawn from a list of all green card recipients at that time, and a significant number of countries were represented. Our analysis used the adult sample and was restricted to individuals aged 18 and older at the time of survey completion. A total of 8573 individuals were surveyed, and 7613 (88.8%) had complete data for the purposes of our analyses. The respondents with missing data (n=960, 11.2%) were excluded largely because of having no data on length of time they have been in the United States (n=327) and having no data (n=537) or nonsensical values for their weight (defined as weight of less than 100 lbs) in pounds (n=115). All data in the survey were self-reported. Chi-square tests showed those with missing data were more likely to be hypertensive, unemployed, current smokers, less educated, and older (all with p<0.01), but no differences in body weight by exclusion status was detected (p=0.60).

Multivariable binary logistic regression analyses, performed in SAS 9.3, were used to identify the associations of length of stay in the United States and employment status with hypertension. All analyses were unweighted, supporting generalization of findings to samples with comparable characteristics. Length of stay, in years, in the United States was calculated as the time since the respondent reported leaving the previous country in which they were living and immigrated to the United States. The presence of hypertension was affirmed if the respondents reported, in response to the only question in the survey regarding hypertension, as having been told by a doctor that they have high blood pressure. No objective measures of hypertension were available in the data. Employment status was categorized respondent responses to the following: "Are you working now, temporarily laid off, unemployed and looking for work, disabled and unable to work, retired, a homemaker, or what?" All respondents who indicated they were currently working were categorized as employed, and all other respondents were categorized as unemployed, and included those who reported being a student, unemployed, doing voluntary work, not authorized/just arrived, or on maternity/paternity leave.

Results

The analytic sample was half (50.3%) female (see Table 1), reported having lived in the United States on average 7.24 years (SD=8.54 years) with over half (60.2%) of the sample reporting that they were employed at the time of the survey. On average, the sample was 38.80 (SD=12.99) years old, and completed 12.85 (SD=4.95) years of schooling. A total of 698 (9.2%) people in the sample were told by a doctor that they had high blood pressure, had an average weight of 153.4 lbs (SD=31.15 lbs), and 89.5% of the sample were non- smokers.

	Full Sample (n=7539)		Hypertensives (n=677)		Non-Hypertensives (n=6862)		p
	M	SD	M	SD	M	SD	
BMI	32.1	14	35.3	16.6	31.8	13.7	<0.01
Age (years)	38.6	12.9	52.2	14.9	37.3	11.9	<0.01
Years of Education	13	4.9	11.3	5.6	13.2	4.8	<0.01
Length of Stay (years)	7.2	8.5	9.15	11.2	7	8.2	<0.01
	n	%	n	%	n	%	
Female	3776	50.10%	349	51.60%	3427	49.90%	0.42
Current Smoker	795	10.60%	71	10.50%	724	10.60%	0.96
Married	5195	68.90%	476	70.30%	4719	68.80%	0.41
Length of Stay							
0-4 years	3762	49.90%	320	47.30%	3442	50.20%	0.15
5-9 years	1440	19.10%	107	15.80%	1333	19.40%	<0.01
10-14 years	1108	14.70%	103	15.20%	1005	14.70%	
15+ years	1229	16.30%	147	21.70%	1082	15.80%	
Hypertensive	677	9.00%					
Employed	4553	60.40%	282	41.70%	4271	62.20%	<0.01

Table 1: Sample Characteristics (n=7539), M=Mean, SD=Standard Deviation.

The adjusted odds ratios for hypertension status are presented in Table 2. The adjusted odds ratios presented are adjusted for all variables in the logistic regression model. The survey-weighted unadjusted logistic regression model (Model 1) that included only employment status and length of stay indicated employed respondents had lower odds of hypertension (OR=0.40, 95% CI=0.33, 0.48), and longer residence in the US was associated with increased odds of hypertension (OR=1.03, 95% CI=1.02, 1.03).

		Model 1		Model 2	
		OR	95% CI	OR	95% CI
Employment Status	Employed	0.4	(0.34-0.47)	0.71	(0.58, 0.86)
	Unemployed	ref		ref	
Length of Stay (years)	0-4 years	ref		ref	
	5-9 years	1.12	(0.89-1.42)	1.34	(1.04-1.73)
	10-14 years	1.42	(1.12-1.80)	1.43	(1.10-1.86)
	15+ years	1.81	(1.47-2.24)	1.44	(1.15-1.81)
Age (years)			1.07	(1.07, 1.08)	
Years of Education			1	(0.98, 1.01)	
Marital Status	Married			0.97	(0.79, 1.19)
	Not Married			ref	
Gender	Female			1.03	(0.86, 1.24)
	Male			ref	
Smoking Status	Current Smoker			1.03	(0.78-1.37)
	Not a Current Smoker			ref	
BMI				1.01	(1.01, 1.02)
AIC		4437.1		3807.3	

Table 2: Weighted logistic regression models of hypertension (n=7539), OR=Odds ratio, CI=Confidence Interval, AIC=Akaike Information Criterion, REF=Referent Group.

Models that additionally included gender, smoking status, age, and education (Model 2, n=7912) indicated that being employed was associated with lower odds of hypertension (OR=0.77, 95% CI=0.60, 0.99), and both increased length of stay (OR=1.01, 95% CI=1.00-1.02) and age (OR=1.07, 95% CI=1.07, 1.08) were associated with greater odds of hypertension. No other significant associations were detected.

Results of the models (Model 3, n=7912) including employment status, length of stay, gender, smoking status, age, years of education and body weight showed significant associations between employment status, gender, age, and weight with the odds of having hypertension. Specifically, respondents who reported being employed had lower odds of being hypertensive than respondents who did not report being employed (OR=0.70, 95% CI=0.56-0.88), and women compared to men (OR=1.52, 95% CI=1.24-1.86), older age (OR=1.08, 95% CI=1.07-1.09) longer residence in the US (OR=1.01, 95% CI=1.07-1.09), and greater body weight (OR=1.01, 95% CI=1.01-1.02) were associated with increased odds of hypertension.

Conclusion

In this paper, we explored the factors associated with hypertension among new immigrants. The fact that almost 10% of the study participants self-reported they had been diagnosed with hypertension indicates that hypertension may be a health concern for new immigrants in the U.S. Hypertension prevalence among new immigrants may be underreported because of less frequent contact

with Western health care providers. In their study using samples from the National Health and Nutrition Examination Survey, Zallman and colleagues [9] also noted that immigrants have a high risk for undiagnosed hypertension (OR 1.35, 95% CI 1.13-1.63, p<0.001).

We found that being employed played a protective role in hypertension development for this population. More studies are needed to explore how different level of occupation impact hypertension. Moreover, we found a significant relationship between length of stay and hypertension which supports findings from previous studies [10-12]. For example, Antecol and Bedard [10] noted that as the number of years spent in the US increases, immigrant's health deteriorates [10]. Specifically, increased years of residency has been shown to increase the risk for hypertension development as a result of acculturation [11,13]. These studies have shown that individuals who have newly arrived in the country tend to report better health than US-born counterparts. Additional studies are needed to assess the onset of health deterioration and its correlates.

Although the gender gap in hypertension continues to get narrower, studies [14,15] continue to support the notion that men are more hypertensive than women. However, the women in our study were more likely to report hypertension than the men. This may be because immigrant women experience unique stressors associated with the intersectionality spanning their multiple roles increasing their risk for poorer health outcomes [16]. Immigrant women also interface with multiple stressors that may increase their risk for hypertension, such as

language barriers, discrimination and becoming acculturated to new societal norms and expectations [17].

Limitations

A limitation of this study is that the data were based on self-report. Thus, some study participants may not have been aware that they were hypertensive. In their report of hypertension and CVD among low income individuals and immigrants in Europe, Modesti et al. [18] noted the limitation of self-report and the importance of effective blood pressure measurement in research studies by a trained healthcare professional with a well calibrated instrument. They noted that although self-report surveys are cost effective, they do not always result in reliable data that can be used to inform interventions and prevention policies. However, this was a secondary analysis of survey data which did not include actual screening of blood pressure. In addition, participants only included individuals who obtained their legal permanent residency papers starting in May 2003. Thus, given that hypertension is a condition that develops over time with chronic exposure to stressors, participants may not have resided in the US long enough at the time of the survey for us to explore length of stay and onset of hypertension. Also we were unable to determine causal relationships because of the cross-sectional nature of the study design. Another limitation of the study was that it was a secondary analysis. Therefore the researchers did not have control over the data collection process.

Implications

Participants in this sample self-reported hypertension at a rate of nearly 10%. This compares with 30% among the nation as a whole [19]. This comparison suggests that hypertension may indeed be lower, or may be underreported among immigrants, possibly due to cultural and language barriers, low use of health care, and other factors. Certainly, higher report of hypertension prevalence among this group of individuals would have significant impacts on our analysis and results. The insidious nature of hypertension, as well as growing size of the immigrant population and the serious and costly health effects of hypertension justify further study of the prevalence of this problem.

Similar to findings of previous studies [20] including a significant relationship between length of stay and hypertension. In their study exploring the NHIS data, Dey and Lucas [20] found higher prevalence of hypertension among immigrants who resided in the US for ≥ 5 years compared to the recent immigrants. Others have not been able to show this relationship. For example, Koya and Egede [21] explored the association between length of stay and cardiovascular disease risk factors. They found that length of stay was strongly associated with obesity (OR 1.31, 95% CI 1.03-1.65), have hyperlipidemia (OR 1.59, 95% CI 1.14-2.22), but found that length of stay was not associated with odds of having hypertension (OR 1.21, 95% CI 0.86-1.71) [21]. These conflicting findings justify further study of the problem.

In this study there was an increased risk of hypertension associated with female sex, older age, and greater body weight. These findings are consistent with other reports [22]. Interestingly, the risk of hypertension was lower among those reporting current employment, even when controlled for age, suggesting a healthy worker effect. Further study is indicated to determine factors associated with this phenomenon.

These findings confirm those of Fang et al. [8] in that US-born adults in both studies had a higher prevalence of hypertension than

foreign born adults. The results of the study reported here extend these findings to show that employed immigrants have an even lower risk of hypertension than US-born persons. Finally, with a prevalence rate of 10%, hypertension may be a significant health concern among immigrants. This finding indicates a need for nurses and other health providers to develop systems of care that are sensitive to the unique needs of this population.

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