

Brief Report

Association Between Long Work Hours and Poor Self-Reported General Health Among Latin American Immigrant and Native Workers in the United States and Spain

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Background *The relationship between hours worked per week and self-reported general health (SRGH) has not been assessed in Latin American immigrant and native workers across host countries.*

Methods *Cross-sectional study of the association between long work hours (LWH) (i.e., >51 hr per week) and poor SRGH using data from 2,626 workers in the United States (immigrants = 10.4%) and 8,306 workers in Spain (immigrants = 4.1%).*

Results *Both countries' natives working >51 hr per week had increased odds of reporting poor SRGH compared to those working fewer hours (U.S.: OR = 1.59; 95% CI = 1.01–2.49; Spain: OR = 2.17; 95% CI = 1.71–2.75); when stratified by sex, increased odds also were observed among immigrant female workers in Spain (OR = 3.47; 95% CI = 1.15–10.5).*

Conclusions *LWH were associated with differential health outcomes in populations of native and Latin American immigrant workers in the United States and Spain, which may reflect social or occupational inequalities in general or resulting from the 2008 financial crisis. Am. J. Ind. Med. 59:1105–1111, 2016. © 2016 Wiley Periodicals, Inc.*

KEY WORDS: *immigrant workers; long work hours; occupational health; self-reported health; Spain; United States; work schedule tolerance*

BACKGROUND

Long work hours (LWH) are considered a factor in numerous adverse health conditions of varying etiologies (e.g., heart disease, musculoskeletal disorders, depression) [Van der Hulst, 2003; Bannai and Tamakoshi, 2014]. Several studies have demonstrated a positive relationship between increasing hours of work and poor self-reported general health (SRGH), though the presence and strength of the association vary depending on the definition of the exposure and the population under study [Van der Hulst, 2003]. Widely used as an index of overall health, measures of SRGH have been shown to be a strong predictor of mortality across numerous populations [Idler and Benyamini, 1997].

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Immigrant workers are at greater risk of less desirable employment conditions and arrangements, such as working long hours, than are native-born workers, which may result in health disparities between native and immigrant workers [Ronda Pérez et al., 2012]. However, to our knowledge, there is no published evidence on the relationship between LWH and poor SRGH that assesses both immigrant and native workers.

For more than 15 years, the United States (U.S.) and Spain have been the primary countries of destination outside of Central and South America for Latin American immigrants, many of whom are seeking economic opportunities [Schenker, 2010]. Immigrants currently comprise approximately 14% of the total populations of both the U.S. and Spain [Migration Policy Institute, 2013], with Latin American immigrants accounting for approximately 46% and 36% of the total immigrant populations, respectively [Instituto Nacional de Estadística, 2011; Migration Policy Institute, 2015]. A comparative approach to assessing immigrant and native worker health in these two countries would allow for the identification of risk factors that are nation-specific as well as those that may be common to the process of migration [Sousa et al., 2014].

No previous comparative studies have evaluated the relationship between LWH and poor SRGH in the U.S. and Spain among Latin American immigrants (hereafter, immigrants) and native workers. The purpose of this study was to assess the relationship between work hours on self-reported health, taking into account immigrant status, among workers in the U.S. and Spain.

METHODS

We conducted a cross-sectional analysis of data from the 2009–2010 U.S. National Health and Nutrition Examination Survey (NHANES) and the 2011 Spanish National Survey of Working Conditions (VII-ENCT) [Gobierno de España, Ministerio de Empleo y Seguridad Social, Instituto Nacional de Seguridad e Higiene en el Trabajo, 2012]. NHANES is a nationally representative time-series survey that has assessed the health and nutritional status of the U.S. residents on an ongoing basis since 1999. During 2009–2010, Hispanic individuals were oversampled to allow for Hispanic origin sub-domain analyses [Curtin et al., 2013]. The VII-ENCT is a representative survey of the non-institutionalized Spanish working population over 16 years of age who reported at least one occupation and at least 1 hr of paid work during the reference week. Both surveys were administered in the home and included questions on demographic information, socioeconomic status, health, and working and employment conditions.

Within each country-specific data set (i.e., NHANES and VII-ENCT), participants were selected for inclusion who were

18 years of age or older, self-identified as either native citizens or immigrants of Latin American origin, reported working during the reference period, and responded to a question about their SRGH status. After inclusion criteria were applied, the NHANES analytical sample comprised 2,626 participants (immigrants: 608, or 10.4% [probability weighted]) and the VII-ENCT analytical sample comprised 8,306 participants (immigrants: 339, or 4.1% [probability weighted]).

An indicator variable identifying participants as natives versus immigrants was constructed from information provided by participants on their country of birth and ethnicity (NHANES) or country of citizenship (VII-ENCT). Work hour data were self-reported by participants. Currently, a work hour cut point demarcating increased risk of adverse health has not been identified, and prior studies have defined LWH in various ways and with inconsistent results [Sparks et al., 1997; Van der Hulst, 2003; Kang et al., 2012; Virtanen et al., 2012; Bannai and Tamakoshi, 2014]. Given this limitation, we identified the cut point for work hours that maximized sensitivity and specificity relative to the outcome of poor SRGH among our analytical sample by utilizing the “cutpt” module in Stata statistical software with the Youden method selected [Youden, 1950; Schisterman et al., 2005; Perkins and Schisterman, 2006]. Approximately 51 hr of work per week was identified as the statistically optimized cut point, and LWH was defined as working >51 hr per week in these analyses, which is consistent with previous studies of LWH [Artazcoz et al., 2009; Artazcoz et al., 2013]. Based on their reported work hours, participants were assigned a binary exposure status of either unexposed to LWH (i.e., those working ≤ 51 hr per week) or exposed to LWH (i.e., those working >51 hr per week). Information on SRGH was captured in both surveys with a question asking participants to evaluate their overall health [Idler and Benyamini, 1997]. For this analysis, SRGH was dichotomized into good versus poor health based on participant response. Good health included responses of “excellent,” “very good,” and “good”; responses of “fair,” “average,” “poor,” “bad,” or “very bad” were defined as poor health.

The statistical analyses included three steps. First, we described the country-specific study samples according to sociodemographic and occupational categories as well as weekly work hours (≤ 51 hr vs. >51 hr) and SRGH status (good vs. poor). Pearson χ^2 statistics were used to compare the prevalence of categorical covariates; given that these were survey data, exact tests were not used. Second, we analyzed the country-specific data sets to estimate the adjusted odds ratios (OR) and corresponding 95% confidence intervals (95% CI) of poor SRGH within the study populations. A step-down model selection process was performed in both country-specific data sets, and a minimum sufficient adjustment set was identified that captured all significant explicative variables across both countries. Covariates tested for significance during the step-down selection process included sex, age, education level, employment status (i.e., self-

employed vs. employed by others), industry, occupation, and shift work; immigrant status, age, sex, education level, and occupation hours were retained in the final model as the adjustment set. Third, we calculated the OR of poor SRGH stratified by immigrant status in the country-specific data sets; an additional analysis further stratifying by sex was also performed. The adjusted regression model included LWH, immigrant status, age, sex, education level, and occupation; when stratified by immigrant status and by immigrant status and sex, these variables were removed from the regression models. All analyses were performed

using Stata/SE software (version 13.1; Stata Corp., College Station, TX). All calculations accounted for clustering and probability weighting using the sampling weights provided by the respective data sets. This research was approved by the Committee for the Protection of Human Subjects at The University of Texas Health Science Center at Houston.

RESULTS

Table I presents descriptive statistics by country. Latin American immigrants represented a greater proportion of

TABLE I. Distribution of Sociodemographic and Occupational Characteristics of a Sample of Latin American Immigrant and Native Workers in the United States and Spain: NHANES 2009–2010, VII-ENCT 2011

	United States				<i>P</i>	Spain				<i>P</i>
	Natives		Latin American immigrants			Natives		Latin American immigrants		
	<i>n</i>	%	<i>n</i>	%		<i>n</i>	%	<i>n</i>	%	
	2,018	89.6	608	10.4		7,967	95.9	339	4.1	
Sex										
Female	972	47.5	254	37.9		3,685	46.7	197	58.6	<0.001
Male	1,046	52.5	354	62.1		4,282	53.3	142	41.4	
Age										
18–29	509	22.9	128	25.8		823	10.5	52	15.4	<0.001
30–49	834	42.7	291	56.3		4,844	60.6	241	70.8	
≥50	675	34.4	189	17.8		2,300	28.9	46	13.8	
Educational level (highest completed)										
Higher education	1,196	65.8	168	28.8		2,252	28.1	69	20.9	<0.001
Secondary school diploma	542	24.7	99	17.4		2,128	27.0	126	38.2	
Did not complete secondary school	241	9.5	332	53.8		3,549	44.9	136	40.9	
Employment status										
Employed by others	1,791	88.2	517	86.2	0.224	6,938	86.7	320	94.2	<0.001
Self-employed	222	11.7	90	13.8		1,000	13.3	18	5.8	
Industry										
Services	1,225	60.1	340	54.9	0.040	5,714	74.5	274	82.6	<0.001
Non-services	793	39.9	267	45.1		2,253	25.5	65	17.4	
Occupation										
Non-manual	764	55.2	93	17.9	<0.001	1,848	23.9	35	10.6	<0.001
Manual	781	44.8	434	82.0		6,097	76.1	302	89.4	
Shiftwork										
Regular daytime shift	1,623	83.5	493	81.2	0.236	5,451	69.0	223	65.8	0.022
Regular evening shift	116	5.0	37	5.8		347	4.4	26	7.7	
Regular night shift	89	3.7	34	5.5		143	1.7	9	2.6	
Rotating shifts	190	7.9	44	7.4		2,016	24.8	81	23.8	
Weekly work hours										
≤51 hr	1,745	85.4	519	84.4	0.588	7,552	94.8	312	91.7	0.015
>51 hr	273	14.6	89	15.6		415	5.2	27	8.3	
Self-reported general health status										
Good	1,732	88.9	389	65.4	<0.001	6,595	82.8	246	72.8	<0.001
Poor	286	11.1	219	34.6		1,372	17.2	93	27.2	

the U.S. study population (10.4%) than the Spanish study population (4.1%). Immigrants in Spain reported working longer hours (i.e., >51 hr per week) than their native counterparts, which was not seen in the U.S. The prevalence of poor SRGH was significantly higher among immigrants than among native workers in both the U.S. and Spain ($P < 0.001$). Among native workers, 11.1% of those in the U.S. and 17.2% of those in Spain reported poor SRGH, compared to 34.6% and 27.2% among immigrant workers, respectively.

In the country-specific analyses (results not shown), immigrant workers were at approximately twofold increased odds of reporting poor SRGH compared to their native counterparts in both the U.S. (OR = 2.19; 95%CI = 1.61–2.98) and in Spain (OR = 1.86; 95%CI = 1.43–2.41). LWH were also associated with increased odds of poor SRGH in the U.S. (OR = 1.53; 95%CI = 1.04–2.26) and Spanish (OR = 2.16; 95%CI = 1.72–2.71) workers.

When stratified by immigrant status (Table II), natives working >51 hr per week had significantly increased odds of reporting poor SRGH in both the U.S. (OR = 1.59; 95%CI = 1.01–2.49) and in Spain (OR = 2.17; 95%CI = 1.71–2.75). A similar magnitude of association was seen among immigrants to Spain (OR = 2.18; 95%CI = 0.97–4.91), but it was not statistically significant. There was no evidence that

LWH was associated with poor SRGH among immigrants to the U.S. (OR = 1.27; 95%CI = 0.70–2.33).

A further stratification by sex as well as immigrant status (Table III) revealed notable strata-specific differences among Spanish workers while attenuating the relationship between LWH and poor SRGH among the U.S. workers. Female workers in Spain exposed to LWH reported approximately 2- to 3.5-times the odds of poor SRGH (natives and immigrants, respectively) compared to their unexposed counterparts, as did male native Spanish workers (OR = 2.40; 95%CI = 1.80–3.20); only male immigrant workers in Spain did not experience higher odds of poor SRGH with longer working hours. Among the U.S. workers, no group demonstrated a statistically significant increase in the odds of poor SRGH when exposed to LWH, though the increase in odds for native male workers approached significance.

DISCUSSION

A higher prevalence of LWH was noted in the U.S. population compared to that of Spain, with no statistical difference seen between the U.S. native and immigrant workers, which may reflect the LWH of the U.S. workers,

TABLE II. Adjusted Odds Ratios of Poor Self-Reported General Health (SRGH) Among Latin American Immigrant Workers and Native Workers in the United States and Spain: NHANES 2009–2010, VII-ENCT 2011

	Latin American immigrant workers				Native workers			
	United States (n = 608)		Spain (n = 339)		United States (n = 2,018)		Spain (n = 7,967)	
	OR	(95%CI)	OR	(95%CI)	OR	(95%CI)	OR	(95%CI)
Weekly work hours								
≤ 51 hr	Ref.		Ref.		Ref.		Ref.	
>51 hr	1.27	(0.70–2.33)	2.18	(0.97–4.91)	1.59	(1.01–2.49)	2.17	(1.71–2.75)
Sex								
Female	Ref.		Ref.		Ref.		Ref.	
Male	0.50	(0.32–0.78)	0.34	(0.19–0.61)	1.01	(0.69–1.47)	0.55	(0.49–0.62)
Age								
18–29	Ref.		Ref.		Ref.		Ref.	
30–49	0.75	(0.43–1.30)	2.30	(0.94–5.61)	1.56	(0.93–2.62)	1.89	(1.45–2.46)
≥50	1.04	(0.57–1.91)	4.10	(1.43–11.8)	1.79	(1.04–3.07)	3.47	(2.65–4.54)
Educational level								
Higher education	Ref.		Ref.		Ref.		Ref.	
Secondary school diploma	3.55	(1.60–7.86)	1.71	(0.80–3.68)	1.52	(0.95–2.43)	1.09	(0.91–1.29)
Did not complete secondary school	8.20	(4.27–15.8)	1.94	(0.88–4.26)	3.46	(2.04–5.88)	1.59	(1.37–1.85)
Occupation								
Non-manual	Ref.		Ref.		Ref.		Ref.	
Manual	3.66	(1.76–7.62)	0.99	(0.40–2.47)	1.54	(0.99–2.39)	1.11	(0.96–1.29)

Regression models adjusted by weekly work hours, sex, age, education level, and occupation.

Ref: referent.

Bold text designates statistical significance at the level of $\alpha = 0.05$.

TABLE III. Adjusted Odds Ratios of Poor Self-Reported General Health (SRGH) Among Latin American Immigrant Workers and Native Workers in the United States and Spain, Stratified by Sex: NHANES 2009–2010, VII-ENCT 2011

	Females						Males					
	Latin American immigrant workers			Native workers			Latin American immigrant workers			Native workers		
	United States (n = 254)	Spain (n = 197)	OR (95%CI)	United States (n = 972)	Spain (n = 3,684)	OR (95%CI)	United States (n = 354)	Spain (n = 142)	OR (95%CI)	United States (n = 1,046)	Spain (n = 4,279)	OR (95%CI)
Weekly work hours												
≤51 hr	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
>51 hr	0.92 (0.27–3.18)	3.47 (1.15–10.5)	1.50 (0.64–3.49)	1.77 (1.17–2.69)	1.43 (0.70–2.91)	1.28 (0.34–4.77)	1.59 (0.93–2.72)	2.40 (1.80–3.20)				
Age												
18–29	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
30–49	0.64 (0.27–1.54)	2.07 (0.76–5.69)	1.01 (0.49–2.08)	1.52 (1.09–2.10)	0.90 (0.45–1.81)	2.50 (0.30–21.1)	2.26 (1.10–4.63)	2.76 (1.74–4.37)				
≥50	1.03 (0.37–2.90)	2.69 (0.78–9.24)	1.30 (0.59–2.88)	2.88 (2.06–4.04)	1.10 (0.52–2.34)	7.15 (0.72–70.8)	2.40 (1.15–5.02)	4.88 (3.06–7.76)				
Educational level												
Higher education	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Secondary school diploma	2.07 (0.68–6.27)	2.50 (0.97–6.45)	2.32 (1.16–4.67)	0.95 (0.76–1.20)	7.96 (2.15–29.4)	0.71 (0.17–3.06)	1.21 (0.66–2.19)	1.33 (1.00–1.76)				
Did not complete secondary school	5.44 (2.17–13.7)	2.45 (0.90–6.67)	4.61 (1.83–11.6)	1.49 (1.23–1.81)	17.2 (5.40–55.0)	1.45 (0.38–5.54)	2.95 (1.58–5.49)	1.79 (1.39–2.30)				
Occupation												
Non-manual	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Manual	2.86 (1.05–7.78)	0.66 (0.18–2.46)	0.95 (0.47–1.94)	1.08 (0.86–1.34)	5.74 (1.48–22.2)	1.85 (0.43–7.95)	2.10 (1.17–3.79)	1.15 (0.93–1.41)				

Regression models adjusted by weekly work hours, age, education level, and occupation.

Ref: referent.

Bold text designates statistical significance at the level of $\alpha = 0.05$.

in general, compared to most other industrialized nations [Organisation for Economic Co-operation and Development, 2015]. In contrast, the higher prevalence of LWH among Spain's immigrant workers is consistent with existing evidence of less desirable working and employment conditions among immigrant workers in Spain [Ronda Pérez et al., 2012]. In general, we found a higher prevalence of poor SRGH in immigrant groups in both countries, which is consistent with previous studies reporting increased odds of poor self-reported health in immigrant workers [Hernández-Quevedo and Jiménez-Rubio, 2009; Sousa et al., 2014].

Within the nativity group analyses, the odds of poor SRGH among those working long hours were significantly increased among native workers in both countries, thereby indicating face validity for the relationship between work hours and poor self-perceived health among these populations. Although immigrant workers had a higher prevalence of poor SRGH, in general, a relationship between LWH and poor self-perceived health was demonstrated among female immigrant workers in Spain but not among immigrant workers residing in the U.S. This may suggest that the health status of immigrant workers in the U.S. was influenced by factors other than hours of work, such as social or occupational conditions, including occupational type.

The study duration coincided with a period of global economic recession and recovery, which was more severe and longer-lasting in Spain than in the U.S. [Eurostat, 2016] Economic recessions have been associated with increased worker exposure to psychosocial risk factors (such as job insecurity), work intensity, and job strain [Quinlan and Bohle, 2009; Houdmont et al., 2012], and, during such times, workers have shown a willingness to tolerate poor job conditions in order to maintain their employment [Utzet et al., 2014]. It is possible that the different results observed between the samples of the U.S. and Spanish workers may reflect the greater extent and duration of the economic crisis in Spain, which may have negatively influenced the perceived health of those workers who kept their jobs (and were, therefore, eligible for inclusion in the VII-ENCT) under increasingly stressful working conditions. The economic context may also have impacted the health of the native U.S. workers more negatively than that of immigrant workers in the U.S., as the former may have been, in general, less familiar with and less prepared for the heightened degree of job insecurity and stress that resulted from the economic downturn. These findings may suggest the presence of a "healthy immigrant effect" in the study population of immigrants to the U.S. and male immigrants to Spain, which posits that immigrants are generally healthier than native-born residents (although the effect tends to decrease as time-of-residence in the host country increases) [Gotsens et al., 2015; Kennedy et al., 2015].

Despite the cross-sectional nature of this study, we believe these findings are an important step in better understanding the association between work hours and health across countries and among working populations. Although the data sets from which the analytical samples were drawn are nationally representative, immigrant populations are often difficult to enumerate and survey, and these results should be interpreted with caution as they may not be representative of all immigrant workers or all Latin American immigrant workers in these countries. Additionally, these data sets either did not capture or broadly categorized several covariates previously associated with immigrant worker health outcomes, including country of birth and time of residence in the host country, which precluded their analyses. A strength of the study is that the proportions of Latin American immigrant workers in the study samples (U.S.: 10.4%; Spain: 4.1%) approximate that of their estimated proportions in the host countries' labor forces (U.S.: 8.7–12.5%; Spain: 2.2–6.1%) [Aysa-Lastra and Cachón, 2012; United States Department of Labor, Bureau of Labor Statistics, 2015; Organisation for Economic Co-operation and Development, 2016], which differ from that of their proportions of the host countries' total populations (U.S.: 6.7%; Spain: 5.1%) [Aysa-Lastra and Cachón, 2012; Grieco et al., 2012]. Future longitudinal studies would allow researchers to further disentangle the effects of work hours and immigration status on worker health and to better quantify the influences of sociocultural contexts and occupational factors on immigrant worker health.

AUTHORS' CONTRIBUTIONS

All authors contributed to the conception or execution of this work. S.H.C. drafted the manuscript with substantial input from A.C.; all other authors reviewed and revised the material critically for important intellectual content. All authors provided final approval of the version to be published and agree to be accountable for all aspects of the work.

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ETHICS APPROVAL AND INFORMED CONSENT

The Committee for the Protection of Human Subjects at the University of Texas Health Science Center reviewed and approved the study protocol. This was an analysis of existing data, and there was no contact between the researchers and study participants. Signed informed consent was previously

obtained from each subject prior to participating in the parent studies (NHANES, VII-ENCT).

DISCLOSURE (AUTHORS)

The authors declare no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

Paul Landsbergis declares that he has no competing or conflicts of interest in the review and publication decision regarding this article.

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