Original Research

Assessing the influence of working hours on general health by migrant status and family structure: the case of Ecuadorian-, Colombian-, and Spanish-born workers in Spain

A. Cayuela [a,b,*], J.M. Martínez [c], E. Ronda [a,b,d,e], G.L. Delclos [d,e,f], S. Conway [f]

[a] Department of Community Nursing, Preventive Medicine and Public Health, History of Science, University of Alicante, Alicante, Spain
[b] Public Health Research Group, University of Alicante, Alicante, Spain
[c] Servicio de Investigación y Análisis IT/EP, MC Mutual, Barcelona, Spain
[d] Center for Research in Occupational Health (CiSAL), Universitat Pompeu Fabra, Barcelona, Spain
[e] Center for Biomedical Network Research on Epidemiology and Public Health (CIBERESP), Madrid, Spain
[f] Department of Epidemiology, Human Genetics and Environmental Sciences, School of Public Health, University of Texas Health Science Center at Houston, Houston, TX, USA

ABSTRACT

Objectives: The purpose of this study was to analyze the relationship between working hours (WHs) and the likelihood of poor self-reported general health (SRGH) in the first data wave from a cohort of immigrant and native workers in Spain.
Study design: Cross-sectional analyses from a prospective cohort study.
Methods: Data were drawn from the first wave of the Platform of Longitudinal Studies on Immigrant Families. The selected sample was composed of 217 immigrant workers and 89 native-born workers. We explored differences by immigrant status and family structure, assessing prevalences and Poisson regression models; an additional analysis explored statistically optimized work hour cut points.
Results: Highest prevalence of poor SRGH (72.7%) was reported by immigrant, single-parent workers working >40 WH/week. Immigrant single-parent families were more likely to report poor SRGH for three WH categories: ≤20 WH/week (prevalence ratio [PR] = 3.3, 95% confidence interval [CI] 1.6—7.2), >30-≤40 WH/week (PR = 2.8, 95% CI 1.3—6.4), and >40 WH/week (PR = 4.2, 95% CI 1.8—10.1). In two-parent families, immigrants working standard hours (i.e. >30-≤40) and native-born workers in the highest and lowest categories of WHs (i.e. ≤20 and >40) had similar PRs for poor SRGH compared with native-born workers working standard hours. Findings suggested that native-born workers residing in two-parent families were able to work more than 10 h longer per week than immigrant workers before reporting equivalent prevalences of poor SRGH.

Conclusions: Differences in the association of WHs and poor SRGH among immigrants in Spain seem to be explained by family structure, which suggests that the influence of WHs on health differentially affects vulnerable groups, such as immigrant workers residing in single-parent families.

Introduction

A number of studies have demonstrated that immigrant workers are disproportionately exposed to adverse occupational conditions, including long working hours (LWHs).[1,2] Working hours (WHs) is an employment condition usually measured as the average time spent working per week, whereas LWHs is an adverse employment condition that exceeds some standard work hour duration. Previous studies have shown associations between LWHs and a number of health-related behaviors (i.e. hazardous alcohol abuse, smoking, sleep disruption) and poor health outcomes (i.e. depressive symptoms, coronary heart disease, metabolic syndrome), but associations are particularly strong in 'subjective health' outcomes (i.e. fatigue, physical ill health, psychological ill health).[3,4] Given this, self-reported general health (SRGH) outcome provides a high-level indicator of an individual's overall health and is a good predictor of mortality, useful in public health research.[5]

Few studies have focused on LWHs and health by immigrant status. Conway et al. (2016)[6] compared working hours and SRGH among immigrant and native-born workers in the United States (US) and Spain and demonstrated that the odds of poor SRGH among those working long hours (defined as ≥51 h per week) were significantly increased among native workers in both countries but not among immigrant workers. When the analysis was further stratified by gender as well as immigrant status, significant associations were seen between LWHs and poor SRGH among immigrant females and native-born workers (both male and female) in Spain, with no significant associations found in any category of the US workers.[6] These equivocal results may be at least partially explained by the use of a single, binary definition of LWHs, which was based on previous research carried out among the US workers,[7] as well as differences in work hour patterns, in general, between the two countries. To our knowledge, there is no accepted practice for defining LWHs among immigrant workers.

The relationship between WHs and health is complicated by numerous potential factors that are external to the work environment but that may influence the LWH−health association, such as caregiving (e.g. childcare, eldercare) and domestic responsibilities (e.g. unpaid housework, meal preparation).[4,8−10] Differing WH thresholds have been associated with reduced mental wellness among women (38.0 WH/w) and men (43.5 WH/w), with increased vulnerability shown among women with substantial domestic responsibilities (31.3 WH/w).[8] Additionally, being the primary contributor of household income (e.g. the 'breadwinner') increases the probability of LWHs being associated with lower levels of psychological well-being and poorer SRGH.[9,10] Adults in single-parent households, who are overwhelmingly female, are far more likely to be both the primary household breadwinner and to have substantial domestic responsibilities than either adult in a two-parent household. This could be an especially vulnerable situation for immigrant workers, given that other social support networks (e.g. family support, community support) have likely been altered by the migratory process itself.

Beginning in the 1990s, Spain transitioned from being a country of emigrants to a country of immigrants over a period of about 10 years. Since that time, a number of studies in Spain have demonstrated that immigrant workers experience greater occupational health risks than Spanish-born workers.[11] At present, employed immigrants represent 10.8% of the total legally employed workforce and at least 11.9% of the total labor force.[12] Ecuador and Colombia are among the leading non-European Union countries from which workers immigrate to Spain,[13,14] and the two countries share similar emigration patterns, including large proportions of female emigrants for whom Spain is the primary country of destination.[15,16] The presence of immigrant families has been increasing through regrouping processes, and approximately 50% of immigrants to Spain currently live in households with their children.[17]

Publicly available data sets on general populations typically have limited immigrant recruitment and may not adequately capture the issues facing immigrant households, given that they are not validated specifically for such a purpose.[18] To address these limitations, we used data from the Platform of Longitudinal Studies on Immigrant Families (PELFI) that focuses on the study of migratory process and health.[14] We hypothesized that immigrant worker health would be more sensitive to WH levels than that of native-born workers; we further hypothesized that worker family structure would influence individuals' responses to WH levels. The purpose of this study was to analyze the relationship between WHs and the likelihood of reporting poor SRGH in a cohort of immigrant and native workers in Spain.

Methods

We used data from the PELFI project, a multisite project of the Immigration and Health Subprogram from the Biomedical Research Consortium Network in Epidemiology and Public Health (CIBERESP SIS) in Spain.[19] This project began in the cities of Badalona, Alicante, and Barcelona. We used the

Barcelona—Alicante databases[14] whose total available sample size was 250 families (193 immigrant families and 57 Spanish-born families). For this, 473 adults (i.e. age ≥18 years) and 304 adolescents (age 12—17 years) were interviewed using a non-probabilistic sample. The baseline field data collection was performed in 2015. More than 60% were recruited through convenience sampling and approximately 30% through snowball sampling techniques.

For this study, we selected: (i) employed workers; (ii) with at least 1 year of work experience in Spain; (iii) who were aged 18—65 years; and (iv) born in Colombia, Ecuador, or Spain. Each participant resided with at least one child in their household and responded to the baseline questionnaire (2015). A total of 217 immigrant workers and 89 native-born workers were included in this study.

For simplicity, we will use the term 'immigrant workers', but we acknowledge that this group is not representative of all immigrants.

The outcome of interest was SRGH, an individual's assessment of his/her overall health based on the question 'In the last 12 months, would you say that your overall health has been?' The interviewee had to choose among five responses: very good; good; fair; poor; and very poor. We combined 'good' and 'very good' as absence of health problems, indicating good SRGH, and the responses 'fair', 'poor', and 'very poor' to indicate poor SRGH.[5,20,21]

The primary explanatory variable was WHs, which was the participant's reported average number of hours per week that he/she had worked in the 4 weeks before the interview. Of the original sample, two participants were missing this measure, and a third participant's extreme value was treated as missing. This variable was used as a continuous and a categorical measure, with the categorical option based on Spanish law stating that '[t]he maximum duration of the ordinary working day shall be 40 h week of average effective work in annual computation'.[22] Although part-time work is defined as any employment contract stipulating fewer than 40 h of work per week, the term is widely used to refer to half-time work, or 20 h per week. Given this, we recoded WHs into the following four categories: ≤20.0 working hours per week (or ≤20 WH/w), 20.1—30.0 h per week (or >20-≤30 WH/w), 30.1—40.0 h per week (or >30-≤40 WH/w), and >40 h per week (or >40 WH/w).

We considered the following sociodemographic covariates as potential confounders: age, sex (i.e. male vs female), and educational attainment. We included the following occupational factors: occupation class (i.e. manual vs non-manual),[23] informal employment (i.e. yes vs no), regular daytime shift work (i.e. yes vs no), exposure to physical demands at the work place (i.e. yes vs no), and income level that precludes covering unforeseen expenses (i.e. sometimes/always able to cover unforeseen expenses vs never able to cover unforeseen expenses). Family structure was constructed as a dichotomous variable capturing whether the family unit was headed by a single parent or by two parents (i.e. single- vs two-parent household). The single-parent category included all workers reporting their status as single or as having a partner who does not reside in the same household. The two-parent category included all workers residing with a partner for at least 6 months before the interview, even if they are not the biological parents of the children in the household.

Statistical analysis

First, we calculated the frequencies and percentage distributions for WHs and other covariates by migrant status and family structure. Single-parent families with Spanish-born individuals were not included in the subsequent statistical analyses owing to small sample size. Next, we visually assessed graphical differences in the prevalence of poor SRGH by WHs, migrant status, and family structure. Then, we constructed Poisson regression models using generalized estimating equations to take into account within-family correlation in SRGH using an exchangeable working correlation with a sandwich estimator.[24] Poisson models produced crude and adjusted prevalence ratios of poor SRGH and 95% confidence intervals (CI). The independent variables of interest were WHs, migrant status, and family structure values; the reference categories for each were individuals working >30-≤40 h per week, who were native-born and residing in two-parent families, respectively. The Poisson models were adjusted by sex, age, educational attainment, occupational class, informal employment, shift work, exposure to physical demands, and earning a wage that does not allow facing unforeseen expenses and city of residence (i.e. Barcelona, Alicante). The adjusted Poisson models were graphed to obtain a better exploration and display of the adjusted prevalence ratio results with their 95% CIs. Finally, postestimation analyses explored the statistically optimized WH cut points that most accurately predicted increased odds of SRGH using the Stata 'cutpt' command with the Youden method specified. Statistical analyses were performed using Stata, v. 14.1, (College Station, Texas, USA) and R software (Vienna, Austria).

Results

We found evidence of significant differences in WHs and sociodemographic and occupational characteristics depending on migrant status and family structure (Table 1). Among those native-born, the highest proportion of workers reported working >30-≤40 h per week (44.6% and 57.1% for two-parent and single-parent families, respectively). Immigrant workers most frequently reported working <20 h or >30-≤40 h per week. The distribution by sex was similar in native-born and immigrant workers within each of the family structures. In general, immigrant workers were younger than those native-born. Additionally, workers who were single parents and immigrant workers residing in two-parent families reported lower levels of educational attainment than native-born workers residing in two-parent families (highest level of education: 14.3% and 15.4% and 18.7%, vs 42.7%, respectively). A similar pattern was observed for occupational class, informal employment, and earning a wage that does not allow for unforeseen expenses; specifically, immigrant single-parent families had the highest percentage of manual workers (96.1%), informal employment (39.7%), and earning a wage that never allow for unforeseen expenses (57.3%). Shift work was more frequently reported by native-born workers than immigrant workers. Exposure to job-related physical demands was higher among immigrant workers in two-parent

Table 1 – Descriptives of sociodemographic and occupational characteristics and health status according to immigrant status and family structure (PELFI, 2015).

Characteristics	Two-parent family				Single-parent family				Total		P
	Native born		Immigrant		Native born		Immigrant				
	n	%	n	%	n	%	n	%	n	%	
Total workers	75	35.1	139	64.9	14	15.2	78	84.8	306	100	
WHs											0.025
≤20	13	17.6	42	30.7	3	21.4	31	39.7	89	29.4	
>20-≤30	6	8.1	19	13.9	0	0.0	12	15.4	37	12.2	
>30-≤40	33	44.6	44	32.1	8	57.1	24	30.8	109	36.0	
>40	22	29.7	32	23.4	3	21.4	11	14.1	68	22.4	
Sociodemographic characteristics											
Sex											<0.001
Men	41	54.7	64	46.0	2	14.3	11	14.1	118	38.6	
Women	34	45.3	75	54.0	12	85.7	67	85.9	188	61.4	
Age in years											<0.001
18–38	5	6.7	40	28.8	3	21.4	32	41.0	80	26.1	
39–44	16	21.3	54	38.9	4	28.6	15	19.2	89	29.1	
45–48	27	36.0	14	10.1	4	28.6	16	20.5	61	19.9	
49–65	36	36.0	31	22.3	3	21.4	15	19.2	76	24.8	
Educational attainment											0.002
High	32	42.7	26	18.7	2	14.3	12	15.4	72	23.5	
Medium	31	41.3	89	64.0	9	64.3	50	64.1	179	58.5	
Low	12	16.0	24	17.3	3	21.4	16	20.5	55	18.0	
Occupational characteristics											
Occupational class											<0.001
No manual	47	62.7	14	10.1	5	38.5	3	3.8	69	22.7	
Manual	28	37.3	124	89.9	8	61.5	75	96.1	235	77.3	
Informal employment											<0.001
No	67	89.3	108	77.7	11	78.6	47	60.3	233	76.1	
Yes	8	10.7	31	22.3	3	21.4	31	39.7	73	23.9	
Shift work: regular daytime											0.026
No[a]	22	29.3	65	47.1	5	35.7	40	51.3	132	43.3	
Yes	53	70.7	73	52.9	9	64.3	38	48.7	173	56.7	
Exposed to physical demands											0.026
No	52	70.3	66	50.4	9	64.3	49	65.3	176	59.9	
Yes	22	29.7	65	49.6	5	35.7	26	34.7	118	40.1	
Wage that does not allow to face unforeseen expenses											<0.001
Sometimes to always	66	88.0	77	58.8	7	53.8	29	42.6	179	62.37	
Never	9	12.0	54	41.2	6	46.1	39	57.3	108	37.63	
Health status											
Self-reported health											<0.001
Good health	55	75.3	92	66.2	7	50.0	27	34.6	181	59.15	
Poor health	20	26.7	47	33.8	7	50.0	51	65.4	125	40.85	

PELFI, Platform of Longitudinal Studies on Immigrant Families; WHs, work hours.
[a] Regular evening or rotating shift, regular night shift, or another schedule.

families (49.6%) and lower in native-born workers in two-parent families (29.7%).

Fig. 1 shows the prevalence of poor SRGH by WHs, family structure, and migrant status. Each group exhibited a non-linear WH–SRGH relationship. The lowest SRGH prevalence (15.2%) was in native-born two-parent families working >30-≤40 WH/w. The highest prevalence of poor SRGH (72.7%) was reported by immigrant single-parent families working >40 WH/w. In general, the prevalence of poor SRGH was higher in immigrant single-parent families than in two-parent families.

Table 2 shows the crude and adjusted prevalence ratios (PRs) of poor SRGH by WHs, immigrant status, and family structure and just the adjusted PR was showed in Fig. 2. Immigrant single-parent families were more likely to report poor SRGH when working <20 h or >30 h per week (≤20 WH/w: odds ratio [OR] = 3.3, 95% CI 1.6–7.2; >30-≤40 WH/w: OR = 2.8,

95% CI 1.3–6.4; >40 WH/w: OR = 4.2, 95% CI 1.8–10.1). Even when working the same hours (>30-≤40 WH/w) and having the same family structure (two-parent family), immigrant workers were more likely to report poor SRGH compared with native-born (>30-≤40 WH/w: OR = 2.6, 95% CI 1.2–5.8). Among native-born two-parent families, the highest and lowest categories of WH were associated with poor SRGH: ≤20 WH/w (OR = 2.6, 95% CI 1.2–6.0) and >40 WH/w (OR = 2.3, 95% CI 1.1–5.1).

Table 3 presents the results from the postestimation analysis, which was executed to determine the statistically optimal working hours cut point among native-born and immigrant participants, stratified by family structure. These results suggest that native-born workers residing in two-parent families can work more than 10 h longer per week than immigrant workers in either single-parent or two-parent
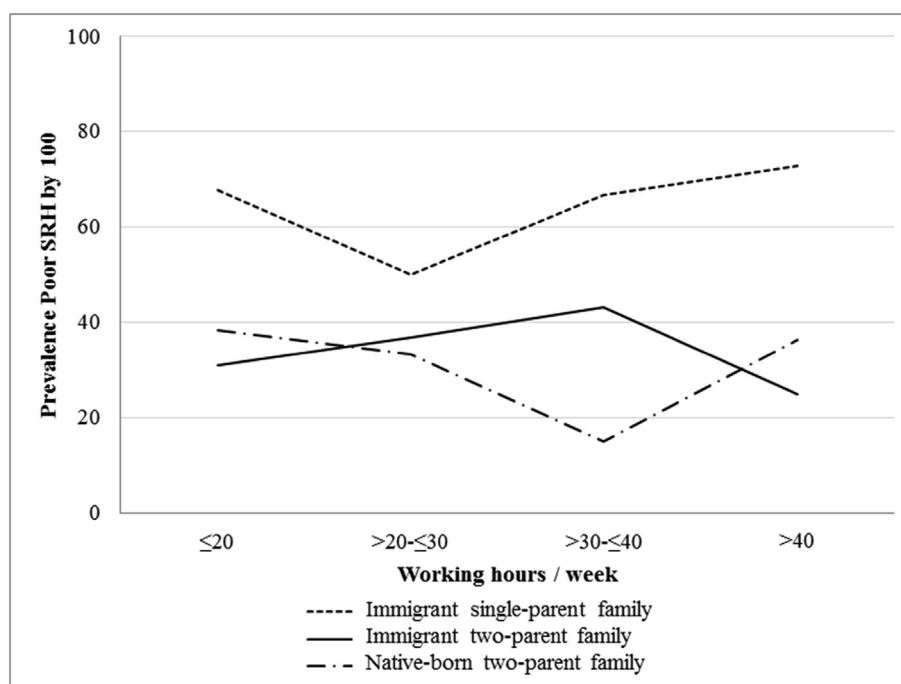
Fig. 1 – Prevalence of poor self-rated general health and working hours per week by family structure and migratory status. PELFI, 2015. Native-born single-parent family was excluded from Fig. 1 and Tables 2 and 3 analysis owing to small sample size. PELFI, Platform of Longitudinal Studies on Immigrant Families; SRH, self-rated health.

Table 2 – Crude and adjusted prevalence ratio of poor self-reported general health for working hours per week, family structure, and migratory status (PELFI, 2015).

Working hours/week	Crude prevalence ratio						Adjusted prevalence ratio					
	Two-parent family				Single-parent family		Two-parent family				Single-parent family	
	Native born		Immigrant		Immigrant		Native born		Immigrant		Immigrant	
	PR	95% CI	PR	95% CI	PR	95% CI	PR[a]	95% CI	PR[a]	95% CI	PR[a]	95% CI
≤20	2.8	(1.1–7.1)	2.0	(0.8–5.1)	4.3	(1.9–10.0)	2.6	(1.2–6.0)	2.0	(0.8–4.8)	3.3	(1.6–7.2)
>20–≤30	1.5	(0.5–4.6)	2.5	(0.9–6.6)	3.2	(1.2–8.7)	1.3	(0.3–6.1)	2.1	(0.9–5.1)	2.2	(0.9–5.3)
>30–≤40	1		2.8	(1.2–6.6)	4.1	(1.7–9.6)	1		2.6	(1.2–5.8)	2.8	(1.3–6.4)
>40	2.1	(0.8–5.4)	1.5	(0.5–4.1)	5.0	(2.1–12.2)	2.3	(1.1–5.1)	1.7	(0.7–4.2)	4.2	(1.8–10.1)

PELFI, Platform of Longitudinal Studies on Immigrant Families; CI, confidence interval; PR, prevalence ratio.
[a] Adjusted prevalence ratio of poor self-reported general health by sex, age, educational attainment, occupational class, informal employment, shift work, exposed to physical demands, and wage that does not allow to face unforeseen expenses and city.

families before reporting the same levels of poor SRGH. Immigrant workers in single-parent families reported the lowest threshold of WHs relative to poor SRGH (24.5 WH/w), followed by immigrant workers in two-parent families (29.0 WH/w) and native-born workers in two-parental families (40.5 WH/w); the relatively small sample of native-born workers in single-parental families did not generate meaningful results.

Discussion

To our knowledge, this is the first study to explore the complex relationship between migrant status and family structure relative to the WH–health relationship. We found evidence that differences in WH patterns related to SRGH among immigrant workers may be explained by family structure. Immigrant workers residing in single-parent families had the highest prevalence and greatest odds of poor SRGH (especially for those working >40 WH/w) when compared with two-parent, native-born workers. However, immigrant workers residing in two-parent families showed risks similar to native-born workers who worked the fewest and most work hours per week (i.e. ≤20 WH/w, >40 WH/w). This suggests that single-parent immigrant workers may be especially vulnerable to poor health if they are working long hours.

Previous studies have suggested that two factors may increase the influence of WHs on health: (1) being the main contributor of the household income; and (2) being the individual with the majority of the domestic responsibilities (e.g. caregiving, cooking, cleaning).[8–10] Ecuadorian- and
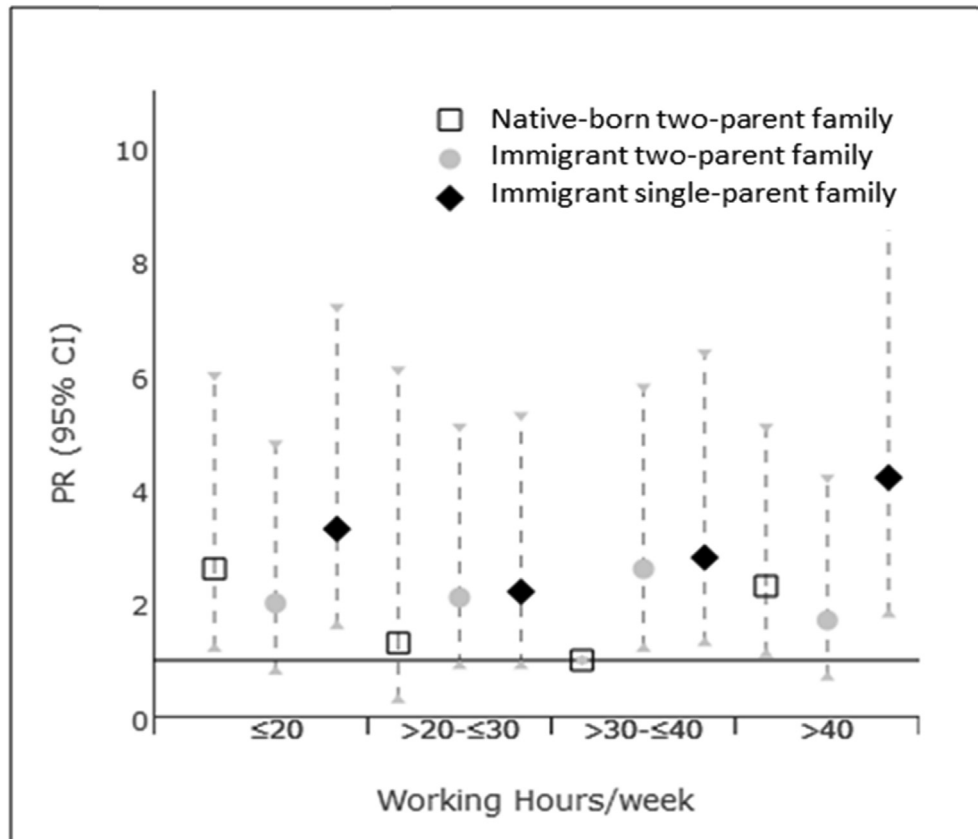
Fig. 2 – Adjusted relative prevalence of poor self-reported general health and working hours per week by family structure and migratory status. PELFI, 2015. PELFI, Platform of Longitudinal Studies on Immigrant Families; CI, confidence interval; PR, prevalence ratio.

Table 3 – Cut point estimation of long working hours for poor self-reported general health by family structure and migratory status (PELFI, 2015).

Youden's J statistics	Two-parent family		Single-parent family	
	Native born	Immigrant	Native born	Immigrant
LWH cut point	40.5	29.0	NA	24.5
Youden index (J)	0.152	0.06	NA	0.07
Sensitivity at cut point	0.3	0.66	NA	0.59
Specificity at cut point	0.85	0.4	NA	0.48
Area under the receiver operating characteristic curve at cut point	0.58	0.53	NA	0.53

LWH, long work hours; NA, not available; PELFI, Platform of Longitudinal Studies on Immigrant Families.

Colombian-born individuals working in Spain and residing in single-parent families tend to be the main contributors to household income.[15,16] Extended family support can shift some of the burden of the domestic responsibilities, but most immigrants do not have this resource. In our study, the single-parent immigrant workers did not appear to have the support of extended family, which may have increased their domestic responsibilities compared with native-born workers and immigrant workers in two-parent households. Most single-parent immigrant families are headed by mothers; thus, single parents may be more sensitive to working hour patterns than workers with live-in partners or extended family support, which may explain some of the relationship between

work hours, gender, and health found in this study and others.[1,8,25] Gender inequalities in occupational health have been found in both the general population[26,27] and the immigrant population; notably immigrant women workers were more likely to report long working hours.[1] We did not perform a gender analysis because of overlapping between gender and family structure, single-parent families are mainly headed by women, and these women are the main breadwinner.

Immigrant workers are especially affected by precarious employment (e.g. low wages, more temporary contracts, informal employment), economic crises, and greater exposure to adverse working conditions than native-born workers.[2,11,28]

Precariousness exposes them to situations of family financial stress, such as being unable to cover unforeseen expenses (e.g. 'living paycheck to paycheck'); in turn, family financial stress increases the likelihood of LWHs. Previous studies in Southern Europe have demonstrated that the LWH—health relationship may be more strongly influenced by being the primary household breadwinner than by marital status;[9,10] this influence was attenuated when the spouse worked, as well. When just one partner has a job, the effect of domestic responsibilities could be attenuated by the time that the unemployed partner dedicates to domestic responsibilities. These two situations may represent protective factors for two-parent family immigrant workers in Spain and explain why their odds of poor SRGH are similar to those of two-parent, native-born workers.

The 10-h difference between the work hour cut points that predicted poor SRGH in native-born and immigrant workers (40.5 vs 29.0 WH, respectively), which was identified in the ad hoc analysis, may be attributed to several factors. Previous studies have shown that occupational class accounts for a large proportion of the association between immigrant status and poor health.[29] In our sample, the majority of immigrant workers performed manual work, especially those residing in single-family households. Immigrant workers in Spain often hold the lowest skilled jobs and are more likely to engage in long working hours due to financial stress or fear of job loss[1,2] rather than for professional goals or personal advancement. Furthermore, we found a 5-h difference in the WH cut points between single-parent immigrant workers and two-parent immigrant workers, which highlights the possible role of family structure as a moderator of the influence of adverse job conditions, including LWHs.

Limitations

Our results should be considered bearing in mind this study's limitations. The SRGH measure does not identify specific health problems. Previous research indicates that responses to this question are based more on physical health problems, and many people without specific health problems respond 'good' more often than 'very good'.[5,20,21] This measure is widely used in research, including working condition surveys and national health surveys. Although sampling was performed in various areas of the city, we cannot rule out some degree of selection bias due to the non-probabilistic sampling techniques. Results should be extrapolated with caution to immigrant populations. The cross-sectional nature of the analysis does not allow us to examine the effect of LWHs on health longitudinally. However, this is the first study with data from the PELFI study, and future analyses will allow us to explore longitudinal effects using subsequent waves of data. Small sample sizes may have precluded the identification of possible statistically significant relationships, such as among Spanish-born workers. That said, this project was specifically designed to better understand immigrant populations, and the population of Spanish-born workers was assessed to provide a robust comparison group. The LWH threshold generated using the Youden method was underpowered and should not be interpreted as a dichotomization of this variable; however, it does provide a novel approach to generate supportive evidence that allows us to corroborate the

differences identified in the primary analyses. Finally, statistical analyses were insufficient to compare single-parent families between immigrant and natives. This was due in part to single-parent families with Spanish-born participants not having been included due to small sample size.

REFERENCES

1. Ronda E, Agudelo-Suárez AA, García AM, López-Jacob MJ, Ruiz-Frutos C, Benavides FG. Differences in exposure to occupational health risks in Spanish and foreign-born workers in Spain (ITSAL Project). *J Immigr Minor Health* 2013 Feb;**15**(1):164–71.
2. Ronda Pérez E, Benavides FG, Levecque K, Love JG, Felt E, Van Rossem R. Differences in working conditions and employment arrangements among migrant and non-migrant workers in Europe. *Ethn Health* 2012 Mar;**17**(6):563–77.
3. Conway SCH. *Long work hours and adverse health outcomes: defining a health risk-based threshold for work hour exposure* [Internet]. 2015. Available from: http://digitalcommons. library.tmc.edu/dissertations/AAI3720076.
4. Bannai A, Tamakoshi A. The association between long working hours and health: a systematic review of epidemiological evidence. *Scand J Work Environ Health* 2014 Jan;**40**(1):5–18.
5. Jylhä M. What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Soc Sci Med 1982* 2009 Aug;**69**(3):307–16.
6. Conway SH, Cayuela A, Delclos GL, Pompeii LA, Ronda E. Association between long work hours and poor self-reported general health among Latin American immigrant and native workers in the United States and Spain. *Am J Ind Med* 2016 Jul 18;**59**(12):1105–11.

7. Conway SH, Pompeii LA, Gimeno Ruiz de Porras D, Follis JL, Roberts RE. The identification of a long work hours threshold for predicting elevated risks of adverse health outcomes. *Am J Epidemiol* 2017 Apr;**186**(2):173–83.

8. Dinh H, Strazdins L, Welsh J. Hour-glass ceilings: work-hour thresholds, gendered health inequities. *Soc Sci Med 1982* 2017 Jan;**18**(176):42–51.

9. Artazcoz L, Cortès I, Benavides FG, Escribà-Agüir V, Bartoll X, Vargas H, et al. Long working hours and health in Europe: gender and welfare state differences in a context of economic crisis. *Health Place* 2016 Jul;**40**:161–8.

10. Artazcoz L, Cortès I, Escribà-Agüir V, Bartoll X, Basart H, Borrell C. Long working hours and health status among employees in Europe: between-country differences. *Scand J Work Environ Health* 2013 Jul;**39**(4):369–78.

11. Ronda-Pérez E, Agudelo-Suárez AA, López-Jacob MJ, García AM, Benavides FG. Scoping review about working conditions and health of immigrant workers in Spain. *Rev Esp Salud Publ* 2014 Dec;**88**(6):703–14.

12. Encuesta de Población Activa (EPA) – epa0415.pdf [Internet]. [cited 2017 Feb 7]. Available from: http://www.ine.es/daco/daco42/daco4211/epa0415.pdf.

13. Instituto Nacional de Estadistica. Estadistica de migraciones 2015 [Internet]. [cited 2017 Jan 27]. Available from: http://www.ine.es/prensa/np980.pdf.

14. Cayuela-Mateo A, Martínez-Martínez JM, Ferrer Serret L, Felt E, Casabona I, Barbarà J, et al. PELFI project: recruitment and sociodemographic characteristics of immigrant and autochthonous families from Alicante and Barcelona city subcohorts. *Rev Esp Salud Publ* 2017 Feb 9;**91**.

15. Herrera G, Espinosa MCC, Torres A. La migración ecuatoriana: transnacionalismo, redes e identidades. *Flacso Sede Ecuad* 2005;**520**.

16. Actis W. La migración colombiana en España: ¿salvados o entrampados? *Rev Indias* 2009 Apr 30;**69**(245):145–70.

17. Instituto Nacional de Estadística. INEbase. Encuesta Continua de Hogares. Resultados [Internet]. Available from: http://www.ine.es/inebaseDYN/ech30274/ech_resultados_1.htm.

18. Monge S, Ronda E, Pons-Vigués M, Vives Cases C, Malmusi D, Gil-González D. Methodological limitations and recommendations in publications on migrant population health in Spain. *Gac Sanit* 2015 Dec;**29**(6):461–3.

19. CIBERESP Immigration and Health Subprogramme (CIBERESP SIS) [Internet]. [cited 2018 May 2]. Available from: http://www.ciberesp.es/en/research-programmes/strategic-subprogrammes/ciberesp-immigration-and-health-subprogramme-ciberesp-sis.

20. Shields M, Shooshtari S. Determinants of self-perceived health. *Health Rep* 2001;**13**(1):18.

21. Eikemo TA, Bambra C, Judge K, Ringdal K. Welfare state regimes and differences in self-perceived health in Europe: a multilevel analysis. *Soc Sci Med* 2008 Jun 1;**66**(11):2281–95.

22. Ministerio de Empleo y Seguridad Social. Ley del Estatuto de los Trabajadores. «BOE» núm. 255, de 24/10/2015. [Internet]. [cited 2017 Jun 8]. Available from: https://www.boe.es/buscar/act.php?id=BOE-A-2015-11430&p=20151024&tn=2.

23. Domingo-Salvany A, Bacigalupe A, Carrasco JM, Espelt A, Ferrando J, Borrell C. Propuestas de clase social neoweberiana y neomarxista a partir de la Clasificación Nacional de Ocupaciones 2011. *Gac Sanit* 2013 May;**27**(3):263–72.

24. Liang K-Y, Zeger SL. Longitudinal data analysis using generalized linear models. *Biometrika* 1986;**73**(1):13–22.

25. Artazcoz L, Cortès I, Borrell C, Escribà-Agüir V, Cascant L. Gender perspective in the analysis of the relationship between long workhours, health and health-related behavior. *Scand J Work Environ Health* 2007 Oct;**33**(5):344–50.

26. Campos-Serna J, Ronda-Pérez E, Artazcoz L, Benavides FG. Gender inequalities in occupational health in Spain. *Gac Sanit* 2012 Aug;**26**(4):343–51.

27. Campos-Serna J, Ronda-Pérez E, Artazcoz L, Moen BE, Benavides FG. Gender inequalities in occupational health related to the unequal distribution of working and employment conditions: a systematic review. *Int J Equity Health* 2013 Aug 5;**12**:57.

28. Agudelo-Suárez AA, Ronda E, Vázquez-Navarrete ML, García AM, Martínez JM, Benavides FG. Impact of economic crisis on mental health of migrant workers: what happened with migrants who came to Spain to work? *Int J Public Health* 2013 Aug;**58**(4):627–31.

29. Cayuela A, Malmusi D, López-Jacob MJ, Gotsens M, Ronda E. The impact of education and socioeconomic and occupational conditions on self-perceived and mental health inequalities among immigrants and native workers in Spain. *J Immigr Minor Health* 2015 Dec;**17**(6):1906–10.