Safety and Health at Work 15 (2024) 491–495

Contents lists available at ScienceDirect

Safety and Health at Work

journal homepage: www.e-shaw.net

Short Communication

Comparison of Working Conditions Between Immigrant and Non-immigrant Healthcare Workers in the United States: Evidence From the National Health Interview Survey

Megan Guardiano [1], Timothy A. Matthews [2], Wendie Robbins [1,3], Jian Li [1,3,4,*]

[1] School of Nursing, University of California Los Angeles, Los Angeles, CA, United States
[2] Department of Environmental and Occupational Health, College of Health & Human Development, California State University Northridge, Northridge, United States
[3] Department of Environmental Health Sciences, Fielding School of Public Health, University of California Los Angeles, Los Angeles, CA, United States
[4] Department of Public Health Nursing, Faculty of Public Health, Mahidol University, Bangkok, Thailand

ARTICLE INFO

Article history:
Received 24 April 2024
Received in revised form
2 September 2024
Accepted 10 September 2024
Available online 11 September 2024

Keywords:
Emigrants and immigrants
Health personnel
Occupational health
Working conditions

ABSTRACT

Immigrants in the United States (U.S.) healthcare workforce face challenging working conditions. This study aimed to compare the working conditions of healthcare workers based on immigration status. Using National Health Interview Survey (NHIS) 2015 data, we compared the sociodemographic characteristics and working conditions between 374 non-U.S. born and 1,986 U.S. born healthcare workers. Multivariable logistic regression was used to examine associations between immigration status and selected working conditions. It was found that non-U.S. born and U.S. born healthcare workers differed in sociodemographic and occupational characteristics. After adjusting for sociodemographic covariates, non-U.S. born healthcare workers had higher odds of non-permanent contract work (aOR: 1.87, 95% CI [1.25, 2.79], $p < 0.01$) and lower odds of workplace harassment (aOR: 0.51, 95% CI [0.31, 0.83], $p < 0.01$), compared to U.S. born healthcare workers. Immigrant healthcare workers' occupational experiences should be further explored to improve organizational and psychosocial working conditions.

1. Introduction

Immigrant healthcare workers in the United States (U.S.) increased by approximately 4.5 million between 2007 and 2021, accounting for 16.5% of the healthcare workforce [1]. This work sector has undergone challenging working conditions from staff shortages and healthcare system demands [1], which escalated during the COVID-19 pandemic with long working hours and negative psychological impacts [2]. Research on migrant workers in health professions has suggested differences in physical and psychosocial occupational health outcomes by immigration status [3]. Considering that work-related issues among migrant workers across industries include high work stressors, long working hours [4], precarious employment, and workplace abuse [5], immigrant healthcare workers may be predisposed to exacerbated working conditions.

Studies on organizational and psychosocial working conditions have provided insight into immigrant healthcare workers' experiences in the U.S. A population-based comparison of some organizational work factors, based on nativity status, found that non-U.S. born healthcare workers worked longer hours annually and had higher likelihood of working night shift, compared to U.S. born healthcare workers [6]. For specific healthcare professions, migrant nurses have experienced acculturation stress, and workplace bullying and discrimination [3]. A statewide nurse study determined that nurses educated outside of the U.S. were more likely to

Megan Guardiano: https://orcid.org/0000-0002-2592-9890; Timothy A. Matthews: https://orcid.org/0000-0001-6220-0831; Wendie Robbins: https://orcid.org/0000-0002-2139-0090; Jian Li: https://orcid.org/0000-0003-2614-4291

* Corresponding author. Department of Environmental Health Sciences, Fielding School of Public Health, School of Nursing, University of California Los Angeles. 650 Charles E. Young Dr. South, Los Angeles, CA 90095, United States.
E-mail address: jianli2019@ucla.edu (J. Li).

2093-7911/$ – see front matter
https://doi.org/10.1016/j.shaw.2024.09.004

positively perceive safety climate, but otherwise had no significant differences in psychosocial work variables, compared to U.S.-educated nurses [7]. However, to the best of our knowledge, there has not been a comparison including both organizational and psychosocial work factors between non-U.S. born and U.S. born healthcare workers among a population-based sample.

Healthcare occupations have a high projected growth rate in the U.S., with immigrant workers as a noteworthy contributor [1]. The potential continued growth of the U.S. immigrant healthcare worker population demonstrates a critical need to prioritize their well-being. The purpose of this cross-sectional study on national, population-based data was to compare the sociodemographic characteristics and working conditions between two healthcare worker groups based on immigration status: non-U.S. born (immigrant) and U.S. born (non-immigrant). We also examined the associations of immigration status with organizational and psychosocial working conditions, after adjusting for sociodemographic characteristics.

2. Methods

The National Health Interview Survey (NHIS) is a U.S. annual survey of health, socioeconomic, and demographic information among noninstitutionalized civilians [8]. Additional information on the NHIS study design may be found at the website of the Centers for Disease Control and Prevention [9]. Only the NHIS 2010 and 2015 survey waves included work-related prompts in the Occupational Health Supplements (OHS) [10]. The NHIS 2015 OHS was selected for this study due to its inclusion of psychosocial work variables, which were not previously incorporated in 2010 [10].

Among the 33,672 participants in NHIS 2015, 56.9% ($n = 19{,}150$) were identified as paid workers. Out of these workers, 12.3% ($n = 2{,}361$) were healthcare workers. Only one healthcare worker was missing immigration status data. The final sample size for this study was 2,360, comprised of 1,986 U.S. born and 374 non-U.S. born healthcare workers.

This study was reviewed and approved for exemption by the University of California, Los Angeles Institutional Review Board (IRB#22-001284) and followed the Declaration of Helsinki and the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines.

Healthcare workers were identified from an affirmation to one of these prompts: “Do you currently volunteer or work in a hospital, medical clinic, doctor’s office, dentist’s office, nursing home or some other health-care facility? This includes part-time and unpaid work in a health care facility as well as professional nursing care provided in the home” or “Do you provide direct patient care as part of your routine work? By direct patient care, we mean physical or hands-on contact with patients” [11]. Immigration status was determined from the query “Were you born in the United States?” [12].

Sociodemographic measures were the continuous variable of mean age, and the categorical variables of sex, educational attainment, annual income, and race and ethnicity.

Organizational work factors were contract type, night shiftwork, and weekly work hours. Psychosocial work factors included job demand, job control, workplace social support, and job insecurity, which reflected the job demand-control model [13] and were dichotomized as “high” and “low.” Workplace harassment was assessed by an affirmative response to being bullied, harassed, or threatened while working during the past 12 months.

Descriptive statistics were calculated for the total sample and the U.S. born and non-U.S. born groups. Between the two groups, sociodemographic characteristics and working conditions were compared via *t*-test for continuous variables and Chi-square test for categorical variables. Selected working conditions with significant results ($p < 0.05$) from the crude comparisons were evaluated as binary outcomes using logistic regression for associations with immigration status. These results were expressed as odds ratios (ORs) with 95% confidence intervals (CIs), depicting the odds of experiencing each working condition outcome for non-U.S. born workers, compared to U.S. born workers as the reference group. Multivariable models adjusted for sociodemographic covariates to produce adjusted ORs (aORs). Model I adjusted for age and sex. Model II additionally adjusted for educational attainment and income. Model III additionally adjusted for race and ethnicity. Analyses were conducted using SAS 9.4 (SAS Inst., Inc., Cary, NC, USA).

3. Results

In Table 1, the comparisons of sociodemographic characteristics and working conditions demonstrated that the groups differed in age, educational attainment, annual income, race and ethnicity, contract type, job demand, job control, job insecurity, and workplace harassment.

For sociodemographic characteristics, non-U.S. born healthcare workers were older ($M = 45.59$, $SD = 12.18$) compared to U.S. born healthcare workers ($M = 43.13$, SD = 13.90; $p = 0.0005$). More U.S. born healthcare workers possessed some college education or an associate’s degree (40.1% vs. 29.1%), but more non-U.S. born healthcare workers had up to a high school education (19.8% vs. 18.1%), bachelor’s degrees (25.1% v. 23.2%), and postgraduate degrees (25.9% vs. 18.6%; $p = 0.0002$). For annual income, more U.S. born healthcare workers earned within the brackets of $25,000-$54,999 (34.2% vs. 29.7%) and ≥$55,000 (29.5% vs. 28.1%), while more non-U.S. born healthcare workers earned within $1-$24,999 (30.5% vs. 23.8%; $p = 0.0455$). While more U.S. born healthcare workers identified as White (71.4% vs. 19.5%), there were more Hispanic (29.9% vs. 8.4%), Black (24.9% vs. 14.6%), and Asian (24.9% vs. 2.4%; $p < 0.0001$) non-U.S. born healthcare workers.

For working conditions, more non-U.S. born healthcare workers worked non-permanent contracts (14.2% vs. 7.8%; $p < 0.0001$) and reported high job insecurity (14.4% vs. 8.9%; $p = 0.0010$). More U.S. born healthcare workers reported high job demand (16.3% vs. 11.5%; $p = 0.0184$), high job control (88.3% vs. 82.6%; $p = 0.0026$), and workplace harassment (12.8% vs. 6.4%; $p = 0.0005$).

In Table 2, from the fully adjusted Model III, the odds of non-U.S. born healthcare workers working non-permanent contracts were significantly 1.87 (95% CI [1.25, 2.79], $p < 0.01$) times greater than that of U.S. born healthcare workers. Additionally, non-U.S. born healthcare workers had 49% lower odds (aOR: 0.51, 95% CI [0.31, 0.83], $p < 0.01$) of reported workplace harassment compared to U.S. born healthcare workers.

4. Discussion

Non-U.S. born and U.S. born healthcare worker groups significantly differed in age, educational attainment, income, race and ethnicity, contract type, job demand, job control, job insecurity, and workplace harassment. After adjusting for age, sex, educational attainment, income, and race and ethnicity, non-U.S. born healthcare workers had increased odds of working non-permanent contract, and lower odds of reported workplace harassment, compared to U.S. born healthcare workers.

Our sociodemographic findings shared some consistencies with previous research, in which non-U.S. born healthcare workers were older, and had higher proportions of bachelor’s and graduate degrees compared to the U.S. born [6]. Our study additionally accounted for high school education, which represented a higher proportion of non-U.S. born healthcare workers, as well as annual

Table 1
Socio-demographic and work characteristics

	Characteristics, n (%)	Total (n = 2,360)	U.S. born (n = 1,986)	Non-U.S. born (n = 374)	p
Socio-demographics	Age (mean, SD)	43.52, 13.67	43.13, 13.90	45.59, 12.18	0.0005
	Sex				0.0562
	Male	589 (25.0)	481 (24.2)	108 (28.9)	
	Female	1,771 (75.0)	1,505 (75.8)	266 (71.1)	
	Education				0.0002
	High school or below	434 (18.4)	360 (18.1)	74 (19.8)	
	Some college or associate's	906 (38.4)	797 (40.1)	109 (29.1)	
	Bachelor's	554 (23.5)	460 (23.2)	94 (25.1)	
	Postgraduate	466 (19.8)	369 (18.6)	97 (25.9)	
	Annual income (USD)				0.0455
	$01–$24,999	586 (24.8)	472 (23.8)	114 (30.5)	
	$25,000–$54,999	791 (33.5)	680 (34.2)	111 (29.7)	
	≥$55,000	690 (29.2)	585 (29.5)	105 (28.1)	
	Unknown	293 (12.4)	249 (12.5)	44 (11.8)	
	Race/ethnicity				<0.0001
	Non-Hispanic White	1,491 (63.2)	1,418 (71.4)	73 (19.5)	
	Hispanic	278 (11.8)	166 (8.4)	112 (29.9)	
	Non-Hispanic Black	333 (16.2)	290 (14.6)	93 (24.9)	
	Non-Hispanic Asian	140 (5.9)	47 (2.4)	93 (24.9)	
	Other	68 (2.9)	65 (3.3)	3 (0.8)	
Working conditions	Contract type				<0.0001
	Permanent	2,153 (91.2)	1,832 (92.3)	321 (85.8)	
	Temporary, freelance, and other	207 (8.8)	154 (7.8)	53 (14.2)	
	Night shiftwork				0.2125
	No	1,835 (77.8)	1,535 (77.3)	300 (80.2)	
	Yes	525 (22.3)	451 (22.7)	74 (19.8)	
	Weekly work hours (mean, SD)	39.91, 13.17	39.99, 13.25	39.50, 12.76	0.5082
	Job demand				0.0184
	Low	1,993 (84.5)	1,662 (83.7)	331 (88.5)	
	High	367 (15.6)	324 (16.3)	43 (11.5)	
	Job control				0.0026
	High	2,062 (87.4)	1,753 (88.3)	309 (82.6)	
	Low	298 (12.6)	233 (11.7)	65 (17.4)	
	Workplace social support				0.3582
	High	2,094 (88.7)	1,757 (88.5)	337 (90.1)	
	Low	266 (11.3)	229 (11.5)	37 (9.9)	
	Job insecurity				0.0010
	Low	2,129 (90.2)	1,809 (91.1)	320 (85.6)	
	High	231 (9.8)	177 (8.9)	54 (14.4)	
	Workplace harassment				0.0005
	No	2,082 (88.2)	1,732 (87.2)	350 (93.6)	
	Yes	2,78 (11.8)	254 (12.8)	24 (6.4)	

Chi-square test for categorical variables, t-test for continuous variables.
SD, standard deviation; USD, United States dollar.
Percentages do not total 100 due to rounding.

income, in which more U.S. born healthcare workers earned $25,000 and above. These educational and income differences may indicate the "brain-waste" phenomenon among highly educated immigrants working lower income jobs, influenced by issues with validation of education abroad in immigration processes [6]. Our study's ethnic and racial representation within the non-U.S. born healthcare group was almost one-third Hispanic, followed by approximately one-quarters non-Hispanic Black and non-Hispanic Asian, respectively, compared to other studies, in which the racial distribution consisted of more Asian healthcare workers born or educated outside of the U.S [6,7]. A previous publication also used NHIS 2015 data to specifically analyze race and ethnicity with occupational characteristics among general workers, resulting in significant differences for Hispanic, non-Hispanic Asian, and non-Hispanic Black workers, in comparison to non-Hispanic White workers [14]. Their findings suggest that the differences of race and

Table 2
Associations of immigration status with working conditions

Working conditions	Immigration status	Crude model OR (95% CI)	Model I aOR (95% CI)	Model II aOR (95% CI)	Model III aOR (95% CI)
Temporary contract	U.S. born	1.00	1.00	1.00	1.00
	Non-U.S. born	1.96 (1.41, 2.74) ***	1.87 (1.34, 2.62) ***	1.68 (1.20, 2.37) **	1.87 (1.25, 2.79) **
High job demand	U.S. born	1.00	1.00	1.00	1.00
	Non-U.S. born	0.67 (0.48, 0.94) *	0.66 (0.47, 0.93) *	0.67 (0.48, 0.95) *	0.73 (0.49, 1.08)
Low job control	U.S. born	1.00	1.00	1.00	1.00
	Non-U.S. born	1.58 (1.17, 2.14) **	1.65 (1.22, 2.23) **	1.62 (1.19, 2.22) **	1.20 (0.84, 1.71)
High job insecurity	U.S. born	1.00	1.00	1.00	1.00
	Non-U.S. born	1.72 (1.24, 2.39) **	1.65 (1.19, 2.29) **	1.78 (1.27, 2.48) ***	1.34 (0.90, 2.00)
Workplace harassment	U.S. born	1.00	1.00	1.00	1.00
	Non-U.S. born	0.47 (0.30, 0.72) ***	0.47 (0.30, 0.72) ***	0.47 (0.30, 0.73) ***	0.51 (0.31, 0.83) **

Logistic regression, odds ratios (ORs) and adjusted ORs (aORs) with 95% confidence intervals (CIs).
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
Model I: adjusted for age and sex.
Model II: additionally adjusted for educational attainment and income.
Model III additionally adjusted for race and ethnicity.

ethnicity may depend on the particular psychosocial or organizational work factor of interest [14]. Notably, after the adjustment for race and ethnicity in our study's Model III, the associations of immigration status with the occupational characteristics of high job demand, low job control, and high job insecurity were no longer significant. Therefore, this identified race and ethnicity as confounding factors, which thus must be considered when examining the differences of immigration status on working conditions in worker populations.

In this study, non-U.S. born healthcare workers had almost twice the odds of working temporary work contracts. In migrant worker research, working temporary positions and precarious employment have been related to work permit visa processes and restrictions, insufficient pay, job insecurity [4], and the lack of work benefits [5]. However, workers in healthcare environments are potentially exposed to knowledge on health and healthcare access. Alternatively, while temporary contract work, a facet of work casualization, has been associated with job insecurity and burnout, nurses have also opted to work multiple positions of varying contracts due to work flexibility and financial motivation [15].

Our findings of lower odds of workplace harassment among non-U.S. born healthcare workers contrast with international results, but may imply underreporting issues. Globally, compared to non-migrants, migrant women had higher likelihood of experiencing workplace harassment, with the highest prevalence in the Americas [16]. Among the 45.6% of workers globally that did not report workplace harassment, the majority of men and women in the Americas reasoned that it would have been a "waste of time" [16]. Workplace harassment has also been associated with poor mental health outcomes among migrant workers [5]. Within the healthcare sector specifically, bullying and discrimination originated from colleagues, management, and patients, and involved outcomes including distress and job dissatisfaction among migrant nurses internationally [3]. Our study's findings may be limited by the NHIS prompt's timeframe within the previous year, thus not reflecting earlier workplace harassment experiences.

Research between 2010 to 2018 based on nativity status suggests that non-U.S. born healthcare workers worked more hours annually and had a higher likelihood of night shiftwork than U.S. born healthcare workers [6]. In contrast, our study did not find significant group differences for weekly work hours and shiftwork, and the overall sample's mean work hours approximated the 40-hour work week. Healthcare sector working hours have since fluctuated, with one-third of a U.S. hospital worker sample reporting over 40 work hours weekly during the COVID-19 pandemic [2]. Long working hours have been associated with ischemic heart disease and stroke [17], warranting future investigation into the occupational health of U.S. healthcare workers.

A limitation of this study includes its identification of healthcare workers and immigration status. Although previously applied in NHIS studies [11,12], this approach introduced variability in participants' work and citizenship statuses, thus limiting generalizability. Findings are limited by the data's nine-year age, and cross-sectional results demonstrate associative rather than causative relationships regarding nativity status, sociodemographic data, and working conditions.

A strength of this study is its insight into immigrant workers, who may be challenging to access due to work organizational barriers [18]. Although this data reflects 2015, this particular survey wave included the comprehensive OHS with psychosocial work factors [10]. To the best of our knowledge, this is the first study using this data to compare working conditions between immigrant and non-immigrant healthcare worker groups in the U.S. Our study highlights compromised U.S. working conditions among immigrant healthcare workers, evidenced by this group's higher odds of non-permanent work contracts, and the need for further investigation into workplace harassment.

This cross-sectional study evaluated U.S. healthcare workers involved in different clinical settings or direct patient care. Comparisons based on nativity status demonstrated that compared to U.S. born healthcare workers, non-U.S. born healthcare workers differed in sociodemographic characteristics and working conditions. After adjusting for sociodemographic covariates, non-U.S. born immigration status was associated with higher odds of non-permanent contract work and lower odds of workplace harassment.

Future research may involve comprehensive evaluations of immigrant healthcare workers' perceptions, work arrangements, workplace harassment experiences, and reporting behavior. Longitudinal studies of this population may examine working conditions with health outcomes and biomarkers. Occupational and societal changes since NHIS 2015 justify a current exploration of working conditions and health among immigrant healthcare workers. According to occupational health research recommendations, study approaches may incorporate collaborative, worker-centered strategies for immigrant worker engagement [18].

Occupational health practice and work organizations may incorporate holistic approaches tailored towards the needs of both immigrant and non-immigrant healthcare workers. Sustainable workplace policies may evaluate and address the psychosocial work environment, with resources and benefits that support the healthcare workforce.

Data accessibility statement

The research utilized publicly accessible data from the 2015 NHIS survey. The analytic SAS codes for this current study are available from the corresponding author on reasonable request.

Funding

M.G. was partially supported by the National Institute for Occupational Safety and Health (NIOSH) Occupational and Environmental Health Nursing Program of the Southern California Education and Research Center (SCERC), Grant Agreement Number T42 OH008412, from the Centers for Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official view of the U.S. CDC. and NCHS.

CRediT authorship contribution statement

Megan Guardiano: Writing – review & editing, Writing – original draft. **Timothy A. Matthews:** Writing – review & editing. **Wendie Robbins:** Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Funding acquisition. **Jian Li:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Acknowledgments

The authors are grateful to the National Center for Health Statistics (NCHS) for providing open access to the National Health Interview Survey (NHIS) datasets.

References

[1] Shakya S. Understanding the role of immigrants in the US health sector: employment trends from 2007–21. Houston (TX): Rice University's Baker Institute for Public Policy; 2024. https://doi.org/10.25613/JSF6-J097.

[2] Sagherian K, Steege LM, Cobb SJ, Cho H. Insomnia, fatigue and psychosocial well-being during COVID-19 pandemic: a cross-sectional survey of hospital nursing staff in the United States. J Clin Nurs 2020;0(0):1–14.

[3] Schilgen B, Nienhaus A, Handtke O, Schulz H, Mosko M. Health situation of migrant and minority nurses: a systematic review. PLoS One 2017;12(6):e0179183.

[4] Aktas E, Bergbom B, Godderis L, Kreshpaj B, Marinov M, Mates D, McElvenny DM, Mehlum IS, Milenkova V, Nena E, Glass DC. Migrant workers occupational health research: an OMEGA-NET working group position paper. Int Arch Occup Environ Health 2022;95(4):765–77.

[5] Moyce SC, Schenker M. Migrant workers and their occupational health and safety. Annu Rev Public Health 2018;39(1):351–65.

[6] Commodore-Mensah Y, DePriest K, Samuel LJ, Hanson G, D'Aoust R, Slade EP. Prevalence and characteristics of non-US-born and US-born health care professionals, 2010-2018. JAMA Netw Open 2021;4(4):e218396.

[7] Nam S, Kwon S, Lee SJ. Differences in employment, job characteristics, and work-related perceptions by sociodemographic factors among registered nurses of diverse race/ethnicity. Nurs Outlook 2022;70(5):737–48.

[8] NCHS. Survey description, NHIS, 2015. Hyattsville, MD; 2016. 111 p.

[9] NCHS. NHIS [Internet]. CDC. n.d. [cited 2024 April 23]. Available from: https://www.cdc.gov/nchs/nhis/index.htm.

[10] NIOSH. Worker health Information from the NHIS: About the questions used in the Occupational Health Supplements [Internet]. CDC. n.d. [cited 2024 April 7]. Available from: https://www.cdc.gov/niosh/topics/nhis/questions.html.

[11] Byrd KK, Lu P-J, Murphy TV. Hepatitis B vaccination coverage among healthcare personnel in the United States. Public Health Rep 2013;128(6):498–509.

[12] Ikonte CO, Prigmore HL, Dawson AZ, Egede LE. Trends in prevalence of depression and serious psychological distress in United States immigrant and non-immigrant populations, 2010 - 2016. J Affect Disord 2020;274:719–25.

[13] Karasek R, Brisson C, Kawakami N, Houtman I, Bongers P, Amick B. The Job Content Questionnaire: an instrument for internationally comparative assessments of psychosocial job characteristics. J Occup Health Psychol 1998;3(4):322–55.

[14] Hawkins D, Alenó Hernández KM. Racial and ethnic differences in the prevalence of work organization and occupational psychosocial exposures. Am J Ind Med 2022;65(7):567–75.

[15] Russo G, Fronteira I, Jesus TS, Buchan J. Understanding nurses' dual practice: a scoping review of what we know and what we still need to ask on nurses holding multiple jobs. Hum Resour Health 2018;16(1):14.

[16] ILO. Experiences of violence and harassment at work: a global first survey; 2022. 54 p. https://doi.org/10.54394/ioax8567. Geneva (Switzerland).

[17] Pega F, Náfrádi B, Momen NC, Ujita Y, Streicher KN, Prüss-Üstün AM, Technical Advisory Group, Descatha A, Driscoll T, Fischer FM, Godderis L, Kiiver HM, Li J, Magnusson Hanson LL, Rugulies R, Sørensen K, Woodruff TJ. Global, regional, and national burdens of ischemic heart disease and stroke attributable to exposure to long working hours for 194 countries, 2000-2016: a systematic analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury. Environ Int 2021;154:106595.

[18] Rosemberg M-AS, Boutain DM, Hsin-Chun Tsai J. Occupational health research beyond the work setting: inclusive inquiry with ethnic minority and immigrant workers. Ethn Health 2021;26(8):1242–60.