

BRIEF REPORT

Immigration-related stressors and health outcomes among low-wage immigrant hotel workers: A pilot study

Marie-Anne S. Rosenberg PhD¹ | Yang Li PhD²  | Carri Polick BSN RN CEN³ ¹Department of Systems, Populations and Leadership, University of Michigan, School of Nursing, Ann Arbor, Michigan, USA²Assistant Professor, University of Texas at Austin, School of Nursing, Ann Arbor, Michigan, USA³T32 Predoctoral Fellow, University of Michigan, School of Nursing, Ann Arbor, Michigan, USA

Correspondence

Marie-Anne S. Rosenberg, PhD, Assistant Professor, Department of Systems, Populations and Leadership, University of Michigan, School of Nursing, Ann Arbor, MI, USA.

Email: sanon@umich.edu

Funding information

Centers for Disease Control and Prevention, Grant/Award Number: T42 OH008455; NIH/NINR, Grant/Award Number: #T32NR016914

Abstract

Background: Immigrants comprise over 40% of the low-wage workforce. They are more likely to be employed in service industries, paid less, and experience more illness and injuries than their native counterparts.**Design/Objective:** The aim of this cross-sectional pilot study was to explore the relationship between immigrant workers' stressors and health.**Sample:** Twenty-five female Mexican immigrant hotel workers.**Measurements:** Surveys and blood samples were analyzed and compared to national data. Descriptive statistics and linear regression were used for analysis.**Results:** Longer length of stay, older age at migration, and higher Demands of Immigration (DI) were significantly associated with more chronic conditions. Higher DI were significantly associated with more depressive symptoms. This is comparable to national data ($n = 468$) which shows a significant relationship between length of stay, Allostatic Load (AL), and chronic conditions ($\beta = 0.14, p = .043$; $\beta = 0.13, p = .025$).**Conclusions:** Immigrant-specific factors affect individuals' health. More studies are needed to further explore the relationship between DI and health among foreign-born workers.

KEYWORDS

allostatic load, health disparities, hotel workers, immigrants, Mexican immigrant, stress, worker health

1 | INTRODUCTION

Latinx individuals make up the largest number of immigrants in the country and are among the largest immigrant groups contributing to the US workforce (Flynn, 2018; Flynn & Eggerth, 2014). In 2015, 67% of the US Latinx population was in the labor force and had a median annual income of \$24,000 (Pew Research Center, 2019). These individuals are more likely to be employed in service industries (e.g., hotel workers) and less likely to occupy managerial positions compared to their US-born counterparts (Flynn & Eggerth, 2014; National Institutes for Occupational Health and Safety, 2015). The Latinx population may

face challenges relating to immigration, language, documentation, and discrimination (Cano et al., 2021), which have been shown to be harmful their health (Cano, 2020; LeBrón et al., 2019; Mann-Jackson et al., 2018). We report immigrant-specific stressors and associations with health outcomes among a group of Latinx workers.

2 | METHODS

This cross-sectional pilot study was approved by the University of Michigan's Institutional Review Board (HUM00115275). Flyers and

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2022 The Authors. *Public Health Nursing* published by Wiley Periodicals LLC.

snowball technique were used to recruit potential participants. Flyers were distributed throughout local hotels in the region. Once they provided written informed consent participants completed a questionnaire. The questionnaire was translated in Spanish by a certified Spanish translator. Once the questionnaire was completed, we collected venipuncture blood samples, and measured blood pressure, pulse, waist and hip ratio in individuals' home following a strict protocol (Rosemberg et al., 2019). Each participant was compensated \$30 for their participation.

2.1 | Measures

We collected demographic data and additional information such as marital status as well as length of stay (in years) in the US. We used the Demands of Immigration (DI) Scale to measure distress levels within the last three months. DI scale contains 23 items with a four-point Likert scale from 0 (not at all upset or not applicable) to 3 (very upset). Example of the questions from the DI scale include: *As an immigrant, I am treated as a second-class citizen; When I think of my original country, I get teary; I have difficulty doing ordinary things because of language barrier.* Everyday discrimination was measured using the nine-item Everyday Discrimination Scale (EDS), rated on a six-point Likert scale from 1 (almost every day) to 0 (never) with higher scores indicating more discrimination.

We used Allostatic Load (AL) to capture one of our health outcomes. AL is the cumulative wear and tear the body incurs from repeated, sustained, or insufficient physiological responses to stressors (McEwen, 2000). AL is operationalized through an Allostatic Load Index (ALI) which is a composite measure of indicators across multiple systems (e.g., cardiovascular, inflammatory). Prior studies have included a range of different physiological indicators to measure AL. For our ALI, we measured the more commonly used AL indicators, including systolic (SBP) and diastolic blood pressure (DBP), pulse, waist/hip ratio (WHR), Body Mass Index (BMI), high density lipoprotein (HDL), hemoglobin A1c (HbA1c), C-reactive protein (CRP), and blood cortisol. A previous report details the blood sample collection and analysis (Rosemberg et al., 2019). The ALI included nine physiological indicators scored with the count-based method. Each indicator was first dichotomized using the top quartiles of the sample distribution as the cut-off point (except for HDL for which the bottom quartile was used). The ALI score was calculated by the summing of the number of dichotomized indicators scoring in the top quartile (except for HDL for which the bottom quartile was used).

We also explored physical and mental well-being as our outcomes. We used the well-established Short Form Health Survey (SF-12) which captures both physical and mental wellbeing (Ware et al., 1996). Additionally, the Patient Health Questionnaire-2 (PHQ-2) was used to assess depressive symptoms (Kroenke et al., 2003). The PHQ-2 includes two items to inquire about the frequency of depressed mood in the past two weeks. Lastly, we inquired if they had ever been diagnosed with a chronic condition and we counted the number of reported chronic conditions.

2.2 | Analysis

Descriptive statistics were calculated for sociodemographic characteristics, immigration-related stressors, and health outcomes. Multiple linear regression analyses were conducted to test associations between immigration-related stressors and health outcomes. Sociodemographic characteristics including age, marital status, education, hourly wage, and health insurance coverage were adjusted for in each regression model.

3 | RESULTS

Among the 25 female Mexico-born immigrant workers, the average age was 37.4 years (SD = 7.5) (Table 1). Most (72%, $n = 18$) were married or partnered, 44% ($n = 11$) had an hourly wage of \$10 or less, 13% ($n = 3$) had high school/GED or above educational levels, and three participants (12.0%) had full or partial health insurance coverage. The average length of stay in the US was 13.5 years (SD = 7.9) and the average age at migration was 23.5 (SD = 9.1). The average DI and everyday discrimination were 20.2 (SD = 13.7) and 0.8 (SD = 1.4), respectively. Eighty percent of the workers sent money to others. The average AL index scores were 2.0 (SD = 1.9). The average number of chronic conditions was 1.3 (SD = 1.7). The average SF-12 physical and mental health scores were 52.3 (SD = 5.9) and 49.8 (SD = 9.0), respectively. The average depressive symptoms were 0.5 (SD = 0.9).

Multiple linear regression analyses showed that among female Mexican immigrants, longer length of stay ($\beta = 0.57, p = .031$), older age of migration ($\beta = 0.88, p = .009$), and higher DI ($\beta = 0.85, p = .010$) were significantly associated with more chronic conditions (Table 2). Everyday discrimination was significantly associated with less chronic conditions ($\beta = -0.63, p = .042$). Higher DI were significantly associated with more depressive symptoms ($\beta = 0.65, p = .030$). There were no significant associations between immigration-related factors with AL index and SF-12 physical and mental health scores ($p > .05$). Longer length of stay ($\beta = 0.53, p < .001$), higher DI ($\beta = 0.89, p < .001$), and lower levels of everyday discrimination ($\beta = -0.80, p < .001$) were significantly related to higher BMI. No significant associations between immigration-related factors with other AL indicators were found ($p > .05$).

3.1 | Comparison with a national sample

We compared our data with the National Health and Nutritional Examination Survey (NHANES) 2017–2018 data because it included foreign-born Mexican participants ($N = 468$). This dataset included length of stay as an immigrant-related factor, eight AL physiological indicators (Pulse, SBP, DBP, BMI, WHR, HbA1c, HDL, and total cholesterol), chronic conditions, and depressive symptoms (PHQ-9). To compare results with the pilot study, we conducted linear regressions with length of stay as the independent variable and AL index score, number of chronic conditions, and depressive symptoms as the dependent

TABLE 1 Sample characteristics (N = 25)

	Mexico-born workers(N = 25)
Sociodemographic characteristics	n (%)
Age, M ± SD/Range	37.4 ± 7.5/26–51
Marital status, n (%)	
Married/partnered	18 (72.0)
Single/divorced/separated/widowed	7 (28.0)
Education, n (%)	
some high school but did not graduate or less than high school	20 (87.0)
high school graduate or GED or more	3 (13.0)
Hourly wage, n (%)	
≤10	11 (44.0)
>10	14 (56.0)
Health insurance coverage, n (%)	
Full or partial	3 (12.0)
No	21 (84.0)
Immigration-related factors	
Length of stay, M ± SD/Range	13.5 ± 7.9/1–29
Age of migration, M ± SD/Range	23.5 ± 9.1/15–48
Demands of immigration, M ± SD/Range	20.2 ± 13.7/0–44
Everyday discrimination, M ± SD/Range	0.8 ± 1.4/0–4
Money sent to others, n (%)	
Yes	20 (80.0)
No	5 (20.0)
Health outcomes	
AL index score, M ± SD/Range	2.0 ± 1.9/0–6
Number of chronic conditions, M ± SD/Range	1.3 ± 1.7/0–6
SF-12 physical health, M ± SD/Range	52.3 ± 5.9/36.8–58.7
SF-12 mental health, M ± SD/Range	49.8 ± 9.0/31.7–65.9
Depressive symptoms, M ± SD/Range	0.5 ± 0.9/0–3

Note: AL index: allostatic load index. Range is the minimum and maximum scores of participants.

TABLE 2 The associations between immigration-related factors and health outcomes among Mexico-born immigrant workers (N = 25)

		AL index	Number of chronic conditions	SF-12 physical health	SF-12 mental health	Depressive symptoms
Length of stay	β	0.03	0.57 [*]	0.36	−0.33	0.14
	p	.941	.031	.335	.233	.533
Age of migration	β	−0.54	0.88 ^{**}	0.32	0.24	0.28
	p	.255	.009	.460	.437	.302
Demands of immigration	β	0.23	0.85 [*]	−0.38	−0.54	0.65 [*]
	p	.616	.010	.380	.108	.030
Everyday discrimination	β	−0.01	−0.63 [*]	0.28	−0.36	−0.01
	p	.986	.042	.522	.266	.966
Money sent to others	β	0.02	−0.45	0.23	0.37	0.22
	p	.962	.054	.488	.149	.285

Note: AL index, allostatic load index. Age, marital status, education, hourly wage, and health insurance coverage were adjusted for in each regression model.

* $p < .05$; ** $p < .01$.



variables. Sociodemographic characteristics including age, gender, marital status, education, and ratio of family income to poverty were adjusted for in each regression model. Length of stay was significantly associated with AL index scores ($\beta = 0.14, p = .043$), number of chronic conditions ($\beta = 0.13, p = .025$), and pulse ($\beta = 0.19, p = .004$). There was no significant association between length of stay with depressive symptoms and other AL indicators ($p > .05$). The results from the NHANES data partially support the results of the pilot study.

4 | DISCUSSION

A unique contribution of this study was that we found a significant association between higher DI score and number chronic conditions and depressive symptoms. Coffman and Norton (2010) also found a significant association between DI and depression while analyzing Mexican immigrants ($n = 99$). Our study highlights that this immigrant group may be experiencing distress across various factors and interactions including: how Americans understand their accent, remembering home, feeling of being at a disadvantage for getting a job, feelings of having fewer opportunities in America, missing family members and friends in the home country, feeling of being an outsider, and not feeling at home.

We found that longer length of stay and being older during the time of migration were significantly associated with more chronic conditions. These findings support Lee et al. (2012) study that have noted significant relationships between length of stay and health among immigrant populations. This finding was also supported by our analysis replication of the NHANES 2017–2018 data.

Surprisingly, in our pilot sample we found that higher everyday discrimination was significantly associated with less chronic conditions. This finding contradicts previous work that have shown a significant association between everyday discrimination and chronic conditions (e.g., Dugan et al., 2017; Molina & Simon, 2014). This unexpected finding may be due to the small sample size, as the p -value was close to the significance level (0.05). This also may be due to the fact the participants had a mean length of time in the US of 13.7 years which may have increased their resilience toward microaggressions.

Also, associations between immigration-related stressors with AL index were not significant. In their 2019 study among 19 immigrant Mexican women with similar length of stay to our study and similar indicators for AL index, D'Alonzo et al. (2019) reported similar AL index score (1.95 ± 1.6 vs. 2.0 ± 1.9 in our study) and did not find significant relationship with length of stay and AL index score. Our analysis of the national sample however showed a significant relationship between length of stay and AL index. In their analysis for 1999–2010 NHANES data, Cedillo and colleagues also reported a significant relationship between length of stay and AL and Latinx individuals in the US (Cedillo et al., 2020). However, their analysis lacked the individuals' perceived stress relating to DI, which we addressed in our pilot sample. Given the small sample size of the pilot study, we did not examine whether length of stay and age at migration moderate the relationships between

immigration-related factors and health outcomes among immigrant workers, which needs to be explored in future research.

4.1 | Limitations

This sample comprised of Mexican immigrants, the findings may not be generalizable to other foreign-born low-wage workers. This pilot study had a sample size of 25, however, other studies have found meaningful results with sample sizes ranging from 19 to 30 (D'Alonzo et al., 2019; De Castro et al., 2010; Juster et al., 2011). To address this limitation the national dataset NHANES was used. However, this comparative national sample only included length of stay. Therefore, we were unable to compare our pilot findings on the other immigrant-related stressors (e.g., DI) to the national sample. Larger studies are needed to have a better understanding of these associations. Also, we only included hotel workers. More studies exploring immigrant-related stressors and AL among immigrant workers from other industries are warranted.

4.2 | Strength

Despite these limitations, this study highlights the physiologic functioning, morbidity, and mental health outcomes among Mexican immigrants. The significant association between immigrant-related stressors (i.e., length of stay, DI) and AL, mental and physical health outcomes among these foreign-born individuals warrant further exploration.

5 | CONCLUSION

This project highlights the need for interventions to address this increased vulnerability of particular groups specifically foreign-born individuals with longer length of stay and their DI. The study also highlights the importance of identifying protective factors to buffer the stressors affecting immigrant workers' health. Although previous work (e.g., Treas & Gubernskaya, 2016; Garcia et al., 2018, 2020) have underscored the several factors that may affect the health of foreign born individuals as their length of stay increase, there have been less focus on DI. This study brings forth important considerations for assessing and implementing health care and policies that are culturally informed. Future studies are needed to support the immigrant-related factors-and AL relationship among foreign-born workers. Those studies in particular need to identify the key structural factors that render these individuals more vulnerable with their AL outcomes as their length of stay in the country increases. Longitudinal studies following individuals from their birth country into the transition to their migrated country are also warranted to further our understanding of risks and protective factors of AL among foreign-born individuals.

ACKNOWLEDGMENT

This study was supported by the Grant or Cooperative Agreement Number, T42 OH008455, funded by the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services. Author CSP was supported by NIH/NINR grant #T32NR016914 Complexity: Innovations for Promoting Health and Safety (PI: Titler).

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Yang Li PhD  <https://orcid.org/0000-0001-8901-3454>

Carri Polick BSN RN CEN  <https://orcid.org/0000-0002-0555-5190>

REFERENCES

- Cano, M. (2020). English use/proficiency, ethnic discrimination, and alcohol use disorder in Hispanic immigrants. *Social Psychiatry and Psychiatric Epidemiology*, 55(10), 1345–1354.
- Cano, M., Portillo, A. G. P., Figueroa, V., Rahman, A., Reyes-Martínez, J., Rosales, R., Cano, M. Á., Salas-Wright, C. P., & Takeuchi, D. T. (2021). Experiences of ethnic discrimination among US Hispanics: Intersections of language, heritage, and discrimination setting. *International Journal of Intercultural Relations*, 84, 233–250.
- Cedillo, Y. E., Bertrand, B., Baker, E., Cherrington, A. L., Beasley, M. T., & Fernández, J. R. (2020). Assimilation, acculturation, and allostatic Load in US-and Foreign-Born Hispanics. *Journal of Immigrant and Minority Health*, 23(1), 35–44.
- Coffman, M. J., & Norton, C. K. (2010). Demands of Immigration, health literacy, and depression in recent Latino immigrants. *Home Health Care Management & Practice*, 22(2), 116–122.
- D'Alonzo, K. T., Munet-Vilaro, F., Carmody, D. P., Guarnaccia, P. J., Linn, A. M., & Garsman, L. (2019). Acculturation stress and allostatic load among Mexican immigrant women. *Revista latino-americana de enfermagem*, 27, e3135.
- De Castro, A. B., Voss, J. G., Ruppín, A., Dominguez, C. F., & Seixas, N. S. (2010). Stressors among Latino day workers. A pilot study examining allostatic load. *American Association of Health Nurses Journal*, 58, 185–196.
- Dugan, S. A., Lewis, T. T., Everson-Rose, S. A., Jacobs, E. A., Harlow, S. D., & Janssen, I. (2017). Chronic discrimination and bodily pain in a multi-ethnic cohort of midlife women in the Study of Women's Health Across the Nation. *Pain*, 158(9), 1656.
- Flynn, M. A. (2018). Immigration, work, and health: Anthropology and the occupational health of labor immigrants. *Anthropology of Work Review*, 39(2), 116.
- Flynn, M. A., & Eggerth, D. E. (2014). Occupational health research with immigrant workers. *Migration and health: A research methods handbook* (p. 377).
- Garcia, M. A., Garcia, C., Chiu, C. T., Raji, M., & Markides, K. S. (2018). A comprehensive analysis of morbidity life expectancies among older Hispanic subgroups in the United States: Variation by nativity and country of origin. *Innovation in Aging*, 2(2), igy014.
- Garcia, M. A., Ortiz, K., Arévalo, S. P., Diminich, E. D., Briceño, E., Vega, I. E., & Tarraf, W. (2020). Age of migration and cognitive function among older Latinos in the United States. *Journal of Alzheimer's Disease*, 76(4), 1493–1511.
- Juster, R. P., Sindi, S., Marin, M. F., Perna, A., Hashemi, A., Pruessner, J. C., & Lupien, S. J. (2011). A clinical allostatic load index is associated with burnout symptoms and hypocortisolemic profiles in health workers. *Psychoneuroendocrinology*, 36, 797–805.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2003). The patient health questionnaire-2: Validity of a two-item depression screener. *Medical Care*, 41(11), 1284–1292.
- LeBrón, A. M., Spencer, M., Kieffer, E., Sinco, B., & Palmisano, G. (2019). Racial/ethnic discrimination and diabetes-related outcomes among Latinos with type 2 diabetes. *Journal of Immigrant and Minority Health*, 21(1), 105–114.
- Lee, S., O'Neill, A., Park, J., Scully, L., & Shenassa, E. (2012). Health insurance moderates the association between immigrant length of stay and health status. *Journal of Immigrant and Minority Health*, 14(2), 345–349.
- Mann-Jackson, L., Song, E. Y., Tanner, A. E., Alonzo, J., Linton, J. M., & Rhodes, S. D. (2018). The health impact of experiences of discrimination, violence, and immigration enforcement among Latino men in a new settlement state. *American Journal of Men's Health*, 12(6), 1937–1947.
- McEwen, B. S. (2000). Allostasis and allostatic load: Implications for neuropsychopharmacology. *Neuropsychopharmacology*, 22(2), 108–124.
- Molina, K. M., & Simon, Y. (2014). Everyday discrimination and chronic health conditions among Latinos: The moderating role of socioeconomic position. *Journal of Behavioral Medicine*, 37(5), 868–880.
- NIOSH, A. (2015). Overlapping vulnerabilities: The occupational safety and health of young workers in small construction firms. National Institute for Occupational Safety and Health (NIOSH) & American Society of Safety Engineers (ASSE).
- Pew Research Center. (2019). *US unauthorized immigrant population estimates by state, 2016*.
- Rosenberg, M. A., Li, Y., McConnell, D. S., McCullagh, M. C., & Seng, J. S. (2019). Stressors, allostatic load, and health outcomes among women hotel housekeepers: A pilot study. *Journal of Occupational and Environmental Hygiene*, 16(3), 206–217.
- Treas, J., & Gubernskaya, Z. (2016). Immigration, aging, and the life course. In *Handbook of aging and the social sciences* (pp. 143–161). Academic Press.
- Ware, J. E., Kosinski, M., & Keller, S. D. (1996). A 12-item short-form health survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care*, 34(3), 220–233.

How to cite this article: Rosenberg, M. -A. S., Li, Y., & Polick, C. (2022). Immigration-related stressors and health outcomes among low-wage immigrant hotel workers: A pilot study. *Public Health Nursing*, 39, 1123–1127. <https://doi.org/10.1111/phn.13086>