

Household environmental safety and perceived stress among uninsured free clinic patients

Claire Dinehart^{a1}, University of Utah, Office of Undergraduate Research, Sill Center 005, Ut 84112, Salt Lake City, United States

Samin Panahi^b, University of Utah, Office of Undergraduate Research, Sill Center 005, Ut 84112, Salt Lake City, United States

Akiko Kamimura^c, University of Utah, Office of Undergraduate Research, Sill Center 005, Ut 84112, Salt Lake City, United States

Suggested Citation:

Dinehart, C., Panahi, S. & Kamimura, A. (2021). Household environmental safety and perceived stress among uninsured free clinic patients. *International Journal of Emerging Trends in Health Sciences*. 5(3), 53-59. <https://doi.org/10.18844/ijeths.v5i3.7155>

Received August 17, 2020; revised September 18, 2021; accepted December 12, 2021.

Selection and peer review under responsibility of Prof. Dr. Nilgun Sarp, Uskudar University, İstanbul.

©2021 Birlesik Dunya Yenilik Arastirma ve Yayıncılık Merkezi. All rights reserved.

Abstract

The purpose of this research project is to examine the association between household environmental safety and stress among uninsured primary care patients who live in poverty. Data were collected from patients of a free clinic using a self-administered survey in Fall 2019. A total of 559 patients participated in the survey. Higher levels of concern regarding environmental issues at home are associated with higher levels of perceived stress. The following demographic characteristics were associated with higher levels of concern regarding household environmental safety issues— higher educational attainment, younger age, and better self-rated general health. Chronic stress concerning an unsafe environment can be a psychological burden and pose health risks to vulnerable populations. Interventions to improve household environmental safety have the potential to reduce the stress-load of uninsured primary care patients.

Keywords: Environmental issues; free clinic; home; perceived stress; safety; social environment.

* ADDRESS FOR CORRESPONDENCE: Akiko Kamimura c, University of Utah, Office of Undergraduate Research, Sill Center 005, Ut 84112, Salt Lake City, United States
E-mail address: kamimura@umich.edu

1. Introduction

The state of the environment can cause significant stress on an individual, regardless of whether or not it is consciously recognized (Brosschot et al., 2018; Gee et al., 2004). The environment is comprised of both indoor and outdoor environments, each of which comes with its own set of safety concerns (Wu et al., 2007). The safety of an indoor environment can be affected by a variety of factors, including but not limited to: indoor air pollution, lead exposure, pesticide contamination, drinking water contamination, weatherization, mold presence, and risk of personal injury (Al horr et al., 2016; VanDerslice, 2011).

Lack of safety in the household may generate stress related to residents' personal safety and the safety of those close to them (Weir et al., 2006). If the exposure to an unsafe environment is prolonged, the individual can experience chronic stress due to their constant safety concerns (Hernandez et al., 2016). Chronic stress has a close relationship to both mental and physical health (Schneiderman et al., 2005). Individuals in poverty are subject to additional stressors, including pertinent monetary, healthcare, prejudice, and environmental concerns (Brondolo et al., 2017). However, little is known about how home environmental issues affect stress levels among underserved populations.

Stressors among free clinic patients have been examined concerning parenting stress and substance use (Kamimura et al., 2018; Kamimura et al., 2017). However, the impact of environmental factors on stress among free clinic patients has not yet been examined. This study increases knowledge about stress among free clinic patients by examining environmental factors which have previously not been included and contribute to the development of more effective stress management interventions for free clinic patients. In addition, previous studies on free clinic patients have shown indications between health behaviors and depression or stress (Kamimura et al., 2014; Kamimura et al., 2013; Kamimura et al., 2015).

1.1. Purpose of study

This study expands upon the links between health behaviors, the built environment, and stress already seen at the clinic, but through the unexplored lens of household environmental safety. The purpose of this research project is to examine the association between household environmental safety and stress among low-income, uninsured individuals utilizing a free clinic. Since stress and health have a well-documented relationship, discovering and subsequently remedying sources of stress could positively affect overall health and well-being.

2. Materials and Methods

2.1. Participants

This project was completed in partnership with a free clinic in the Intermountain region of the United States. The clinic provides free primary care services to uninsured patients who have an income at or below 150 percent of the federal poverty level. Founded in 2005, the clinic provides a wide range of medical services with a primary focus on preventative care. The clinic is operated with a small paid staff but relies primarily on volunteers, coordinating a network of about 400 volunteers. Funding sources for the clinic include donations and non-governmental grants. The clinic specializes in preventative care providing vaccines, certain cancer screenings, and mental health indices. Primary care is not limited to physical indicators of well-being, and assessing mental health is an integral part of comprehensive healthcare. While the clinic does not provide counseling or mental health services, they assist in prescription acquisition and can provide references to affordable services. The clinic also offers healthy living classes, providing resources and information to improve patients' home environments and lifestyles and facilitate greater well-being.

2.2. Data collection

This project was approved by the Institutional Review Board (IRB) of the University of Utah. Data were collected through a self-administered survey in the clinic waiting room from September to November of 2019. The survey and consent letters were available in both English and Spanish to accommodate the two major languages spoken by patients at the clinic. The English survey was translated into Spanish by one translator and then back-translated by another translator to verify that the translation was accurate. Patients over the age of 18 who spoke either English or Spanish and were interested in completing the survey were provided with survey materials. Participants were recruited by research assistants in the waiting room, making this a convenient sample. Each patient participated in the study only once. Participants who completed a survey were gifted either a toothbrush or a face towel (valued at \$1 U.S. or less).

2.2.1. Home environments

Home environments were measured using items from the Home Safety Self Assessment Tool (HSSAT) (Tomita, 2021). For the kitchen, bedroom, and bathroom areas, the tool lists a set of potential problems. For example, kitchen (9 items)—the presence of slippery floor; bedroom (10 items)—unsafe carpet; bathroom (11 items)—slippery tub. Participants check-marked boxes next to the safety concerns present in their living spaces.

2.2.2. Original home environment scale

The original scale was created to ask about concerns about environmental issues at home. The scale had 5-items such as indoor air pollution, lead exposure, pesticide contamination, water contamination, and mold, and used a 5-point Likert scale to measure participant concern (1= not at all, 5=extremely).

2.2.3. Perceived stress levels

Levels of stress were assessed using the Perceived Stress Scale (10 Items) (Cohen et al., 1983). The scale consists of 10-items such as, "How often have you been upset because of something that happened unexpectedly?" or "How often have you felt nervous and "stressed"?" and uses a 5-point Likert scale (0=never, 4=very often). Four of the items are reverse coded, so higher scores indicate higher levels of perceived stress. The scoring is based on the sum of the scores of 10-items. Cronbach alpha value for this study population was 0.71.

2.2.4. Socio-demographic characteristics

The following socio-demographic characteristics were recorded: age, gender, race/ethnicity, educational attainment, employment status, marital status, nativity, and years of being a clinic patient (2 years or longer). In addition, participants were asked to self-rate their general health using a 5-point Likert scale (1=excellent, 5=poor).

2.3. Data analysis

Data were analyzed by statistical software IBM SPSS ver. 25. Descriptive statistics were obtained using chi-square for categorical variables and ANOVA for continuous variables. Two multiple regression analyses were performed to test the association among variables. The dependent variable of one of the regression analyses was perceived stress. The other regression analysis had environmental concerns as a dependent variable.

3. Results

Table 1 summarizes the characteristics of 559 participants (U.S.-born English speakers $N = 92$, non-US born English speakers $N = 140$, Spanish speakers $N = 327$). Slightly more than 70% of the participants were women ($N = 400$, 71.6%). The largest self-identified racial/ethnic group was Hispanic/Latina/Latino ($N = 402$, 71.9%) followed by non-Hispanic white ($N = 83$, 14.8%) and Asian or Pacific Islander ($N = 38$, 6.8%). Approximately 40% of the participants had some college or higher. The percentage of having some college or higher educational attainment was lowest among Spanish speakers ($N = 122$, 37.3%, $p < 0.05$). Approximately half of the participants were currently employed ($N = 278$, 49.7%). Slightly less than half of the participants were married ($N = 257$, 46%). The percentage of those who were married was lower among U.S.-born English speakers ($N = 11$, 12%) compared to non-US-born English speakers ($N = 74$, 52.9%) and Spanish speakers ($N = 172$, 52.9%) ($p < 0.01$). Approximately forty percent of the participants ($N = 231$, 41.3%) had been clinic patients for two years or longer. The average age of the participants was 47.35 ($SD = 13.95$). U.S.-born English speakers ($M = 39.74$, $SD = 13.34$) were significantly younger than non-US born English speakers ($M = 48.26$, $SD = 16.02$) and Spanish speakers ($M = 49.22$, $SD = 12.31$) ($p < 0.01$). The average level of self-reported general health was 3.13. ($SD = 0.94$).

Table 1 also presents home environmental problems, levels of environmental concerns, levels of perceived stress, and levels of home environmental concerns. The top three problems in the kitchen included: using a stool or a chair to reach things 24.7% ($N = 138$), not enough counter space 21.1% ($N = 118$), and cabinets too high or low 17.4% ($N = 97$). U.S.-born English speakers reported the highest percentage of not enough counter space among the three groups ($p < 0.01$). Top three problems in bedrooms were: presence of clutter 12.9% ($N = 72$), lack of night light 10.4% ($N = 58$), and lack of a telephone near the bed 7.9% ($N = 44$). U.S.-born English speakers reported the highest percentage of presence of clutter (27.2%) among the three groups ($p < 0.01$). The top three problems in bathrooms included a lack of grab bars in the tub 19% ($N = 106$), a lack of grab bars in the shower area 15.7% ($N = 88$), and a slippery tub (lack of bath mat, etc.) 11.4% ($N = 64$). Non-U.S.-born English speakers reported the lowest percentage for lack of grab bars in the tub ($p < 0.01$). The average level of environmental concerns was 1.60 ($SD = 0.90$). The mean score for perceived stress was 17.23 ($SD = 6.01$). Spanish speakers reported lower levels of perceived stress ($M = 16.18$, $SD = 5.71$), followed by non-U.S.-born English speakers ($M = 17.28$, $SD = 5.12$) and the U.S.-born English speakers ($M = 20.54$, $SD = 6.85$). Among the five home environmental concerns, indoor air pollution exhibited the highest score ($M = 2.09$, $SD = 1.27$). U.S.-born English speakers reported higher levels of concerns about mold ($p < 0.01$).

Table 2 shows factors associated with levels of self-rated stress. While being a U.S.-born English speaker ($p < 0.05$), poorer self-rated general health ($p < 0.01$), and higher levels of environmental concerns ($p = 0.05$) were associated with higher levels of perceived stress, older age was related to lower levels of perceived stress. Table 3 summarizes factors associated with levels of environmental concern. The following items are related to higher levels of environmental concern: some college or higher ($p < 0.05$) and younger age ($p = 0.01$).

4. Discussion

This study examined the association between household environmental safety and perceived stress among low-income, uninsured primary care patients and has three main findings. First, higher levels of concern regarding environmental issues at home are associated with higher levels of stress. Second, free clinic patients reported several home environmental issues, especially concerning kitchen height. Third, higher levels of educational attainment and younger age were associated with higher levels of concern about home environmental issues.

The results of this study indicate that higher levels of concern regarding environmental issues at home are associated with higher levels of stress and are consistent with the findings of previous studies that in general, unsafe environments and conditions are related to chronic stress (Brosschot et al., 2018). Several studies suggest that the neighborhood environment affects stress levels (Matthews et al., 2010). The current study adds two new pieces of knowledge about the environment and stress. First, the "environment" that can affect stress levels includes the home environment. Second, since underserved populations tend to live in poor home environments (Hernandez et al., 2016), home environments should be more focused on reducing stress levels among the population.

When looking at specific problems or concerns at home, unsafe or inconvenient environmental attributes were mainly reported in the kitchen, while an additional concern was indoor air pollution. The results indicate that home kitchen safety needs greater attention to promote well-being among underserved populations. There are many sources of indoor air pollution, such as tobacco products, building materials, and household cleaners (United States Environmental Protection Agency, 2021). Future research should address specific sources of concern about indoor air pollution to develop specific interventions.

The subsequent main findings show that those younger or those with higher educational attainment are more likely to be concerned about the home environment. These factors are not necessarily related to the high-risk groups for indoor pollutants (e.g., children/youth, older adults, and those with chronic illness) (CDC, 2021). Instead, those younger or who have higher educational attainment may be more aware of home environments and, therefore, are more concerned. To promote health and well-being, older adults and those with lower educational attainment should be the target populations for health education focusing on home safety and indoor environments.

5. Conclusions

The study results indicate the most relevant areas of environmental safety that can be improved upon to alleviate the stress that patients are experiencing. The findings of this study will provide insight into the relationship between household environmental safety and stress among low-income individuals utilizing a free clinic. Chronic stress concerning an unsafe home environment can be a psychological burden and pose health risks to vulnerable populations. Interventions to improve household environmental safety have the potential to reduce the stress-load of uninsured primary care patients. Remedying household environmental issues can range from simple changes, like proper chemical storage, to large-scale remodeling projects, like lead abatement. Providing education about household environmental safety and information about local resources to older adults and lower education free clinic populations is the first step toward improving stress conditions in at-risk populations.

While this project provides important new knowledge about home environments and perceived stress among underserved populations, limitations exist. First, the participants are a convenience sample and may not represent the entire clinic patient population. Second, this study was cross-sectional and does not determine causal directions among variables. Third, more than 70% of our participants were female. Fourth, because this study was done at one free clinic, the results may not directly apply to other health care facilities.

Disclosure Statement

The authors declare that they have no conflicts of interest.

Funding

There is no funding to report.

References

- Al horr , Y., Arif, M., Katafygiotou, M., Mazroei, A., Kaushik, A., & Elsarrag, E. (2016). Impact of indoor environmental quality on occupant well-being and comfort: A review of the literature. *International Journal of Sustainable Built Environment*, 5(1): 1-11. <https://doi.org/10.1016/j.ijsbe.2016.03.006>
- Brondolo, E., Byer, K., Gianaros, P. J., Liu, C., Prather, A. A., Thomas, K., & Woods-Giscombé, C. L. (2017). *Stress and Health Disparities Report*. <https://www.apa.org/pi/health-disparities/resources/stress-report.pdf>
- Brosschot, J. F., Verkuil, B., & Thayer, J. F. (2018). Generalized unsafety theory of stress: Unsafe environments and conditions, and the default stress response. *International journal of environmental research and public health*, 15(3). <https://www.mdpi.com/270218>
- Centers for Disease Control and Prevention. (2021). *Chapter 5: Indoor Pollutants and Toxic Materials*. <https://www.cdc.gov/nceh/publications/books/housing/cha05.htm>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24(4), 385-396. <https://www.jstor.org/stable/2136404>
- Gee, G. C., & Payne-Sturges, D. C. (2004). Environmental health disparities: A framework integrating psychosocial and environmental concepts. *Environmental Health Perspectives*, 112(17), 1645-1653. <https://ehp.niehs.nih.gov/doi/abs/10.1289/ehp.7074>
- Hernandez, D., Phillips, D., & Siegel, E. L. (2016). Exploring the Housing and Household Energy Pathways to Stress: A Mixed Methods Study. *International Journal of Environmental Research and Public Health*, 13(9). <https://www.mdpi.com/156432>
- Kamimura, A., Ashby, J., Jess, A., Chernenko, A., Tabler, J., Trinh, H. N., Nourian, M. M., Aguilera, G., & Reel, J. J. (2015). Stress, coping strategies, and depression - uninsured primary care patients. *American Journal of Health Behavior*, 39(6), 742-750. <https://www.ingentaconnect.com/content/png/ajhb/2015/00000039/00000006/art00001>
- Kamimura, A., Ashby, J., Nourian, M., Assasnik, N., Chen, J., Tabler, J., Aguilera, G., Blanton, N., Jess, A., & Reel, J. (2018). Parental health-related quality of life, depression, and stress among low-income immigrants. *International Journal of Migration Health and Social Care*, 14(2), 199-207. <https://www.emerald.com/insight/content/doi/10.1108/IJMHS-11-2016-0041/full/html>
- Kamimura, A., Ashby, J., Tabler, J., Nourian, M. M., Ha Ngoc, T., Chen, J., & Reel, J. J. (2017). The association between tobacco, alcohol, and drug use, stress, and depression among uninsured free clinic patients: US-born English speakers, non-US-born English speakers, and Spanish speakers. *Journal of Ethnicity in Substance Abuse*, 16(1), 122-136. <https://www.tandfonline.com/doi/abs/10.1080/15332640.2015.1102114>
- Kamimura, A., Christensen, N., Prevedel, J. A., Tabler, J., Hamilton, B. J., Ashby, J., & Reel, J. J. (2014). Quality of life among free clinic patients associated with somatic symptoms, depression, and perceived neighborhood environment. *Journal of Community Health*, 39(3), 524-530. <https://link.springer.com/article/10.1007/s10900-013-9790-x>
- Kamimura, A., Christensen, N., Tabler, J., Ashby, J., & Olson, L. M. (2013). Patients utilizing a free clinic: physical and mental health, health literacy, and social support. *Journal of Community Health*, 38(4), 716--723. <https://link.springer.com/article/10.1007/s10900-013-9669-x>
- Matthews, S. A., & Yang, T. C. (2010). Exploring the role of the built and social neighborhood environment in moderating stress and health. *Annals of Behavioral Medicine*, 39(2), 170-183. <https://academic.oup.com/abm/article-abstract/39/2/170/4566651>
- Schneiderman, N., Ironson, G., & Siegel, S. D. (2005). Stress and health: Psychological, behavioral, and biological determinants. *Annual Review of Clinical Psychology*, 1, 607-628. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2568977/>

- Dinehart, C., Panahi, S. & Kamimura, A. (2021). Household environmental safety and perceived stress among uninsured free clinic patients. *International Journal of Emerging Trends in Health Sciences*. 5(3), 53-59. <https://doi.org/10.18844/ijeths.v5i3.7155>
- Tomita M. *Safety Self Assessment Tool (HSSAT)*. https://publichealth.buffalo.edu/content/sphhp/rehabilitation-science/research-and-facilities/funded-research/aging/home-safety-self-assessment-tool/_jcr_content/par/download_526197706/file.res/HSSAT-v.5-1-12-17.pdf
- United States Environmental Protection Agency (EPA). *Introduction to Indoor Air Quality*. <https://www.epa.gov/indoor-air-quality-iaq/introduction-indoor-air-quality>
- VanDerslice, J. (2011). Drinking water infrastructure and environmental disparities: Evidence and methodological considerations. *American Journal of Public Health*, 101, S109-S114. <https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2011.300189>
- Weir, L. A., Etelson, D., & Brand, D. A. (2006). Parents' perceptions of neighborhood safety and children's physical activity. *Preventive Medicine*, 43(3), 212-217. <https://www.sciencedirect.com/science/article/pii/S0091743506001514>
- Wu, F., Jacobs, D., Mitchell, C., Miller, D., & Karol, M. H. (2007). Improving indoor environmental quality for public health: Impediments and Policy Recommendations. *Environmental Health Perspectives*, 115(6), 953-957. <https://ehp.niehs.nih.gov/doi/abs/10.1289/ehp.8986>