

Biological Embedding of Stress: Allostatic Load and Cognition in Undocumented Hispanic/Latino Adults

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KEY TAKEAWAY: In 183 foreign-born Hispanic/Latino adults, each 1-point increase in allostatic load was associated with a 0.20 SD decline in cognition ($\beta = -0.201$, $p = 0.003$) — chronic immigration-related stress is biologically embedded and detectable decades before typical dementia onset. Education was strongly protective.

INTRODUCTION	METHODS	RESULTS	CONCLUSIONS	REFERENCES
Chronic stress exposure Undocumented Hispanic/Latino adults face chronic immigration-related stressors that become biologically embedded as dysregulation across multiple systems: allostatic load (AL). The gap AL has been linked to accelerated aging and disease, yet its association with cognitive function in early midlife remains unexplored. Objective Examine AL and cognitive performance in an underserved, community-based population at elevated risk for Alzheimer’s disease and related dementias (ADRD).	Sample 183 foreign-born Hispanic/Latino adults. Mean age 48 years (range 35–60); mean age at migration 29.8 years; 52.8% female; mean education 10.2 years. Allostatic load Biomarkers spanning cardiovascular (blood pressure, pulse pressure), metabolic (HbA1c, glucose, lipids, BMI, waist–hip ratio), and inflammatory systems. Each biomarker in the high-risk quartile contributed one point to the AL composite. Cognition Cognitive domain scores were combined into a composite z-score. Analysis Linear mixed-effects models examined AL–cognition associations, adjusting for age, sex, and education.	Figure 1. Association Between Allostatic Load and Cognitive Function in Hispanic/Latino Immigrants (N=183). Higher AL associated with lower cognitive scores. $\beta = -0.201$, $p = 0.003$. Figure 1 is a scatter plot showing the relationship between Allostatic Load Score (X-axis, 0 to 8) and Cognitive Composite Score (Y-axis, -2.5 to 15.0). The data points are blue dots, and a red regression line shows a negative correlation. A text box in the upper left corner states: "Higher AL associated with lower cognitive scores. $\beta = -0.201$ (SE = 0.067), $p = 0.003$". Higher AL was significantly associated with lower cognitive performance ($\beta = -0.201$, SE = 0.067, $p = 0.003$). Each 1-point increase in AL corresponded to a decline of 0.20 standard deviations in cognitive function. Education emerged as a strong protective factor ($\beta = 0.161$, SE = 0.023, $p < 0.001$): each additional year was associated with better cognition, independent of AL burden.	Figure 2. Cognition by AL tertile. High-AL adults scored significantly lower (mean 5.21, SD 1.76) than low-AL adults (mean 6.06, SD 1.51; $p = 0.001$). Figure 2 is a box plot showing Cognitive Composite Score (Y-axis, 0 to 12) across three Allostatic Load Groups (X-axis): Low AL (Bottom Tertile, n=57), Medium AL (Middle Tertile, n=50), and High AL (Top Tertile, n=54). The boxes are colored green for Low AL, orange for Medium AL, and pink for High AL. Individual data points are overlaid on the boxes. A red diamond indicates the Group Mean for each tertile. A text box in the upper right corner states: "Higher AL associated with lower cognition ($p = 0.003$)". Chronic immigration-related stress becomes biologically embedded as elevated allostatic load and is associated with measurable cognitive decrements decades before typical dementia onset. Cognitive risk markers are detectable in early midlife, a critical window for intervention. Findings support early AL screening in high-risk populations and multilevel interventions: stress reduction programs, community support services, and policies promoting educational access.	1. McEwen BS, Gianaros PJ. Central role of the brain in stress and adaptation. <i>Ann N Y Acad Sci.</i> 2010;1186:190-222. 2. Seeman TE, et al. Price of adaptation: allostatic load and its health consequences. <i>Arch Intern Med.</i> 1997;157:2259-2268. 3. Salazar CR, et al. Nativity differences in allostatic load among US Hispanics/Latinos. <i>SSM Popul Health.</i> 2016;2:416-424. 4. Perreira KM, Pedroza JM. Policies of exclusion: health of immigrants. <i>Annu Rev Public Health.</i> 2019;40:147-166. 5. Stern Y, et al. Whitepaper: defining cognitive reserve, brain reserve, brain maintenance. <i>Alzheimers Dement.</i> 2020;16:1305-1311.
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