

Food Insecurity and Brain Health In Latino Families: Insights from the Skills-based Educational for Reduction of Vascular Events in Orange County (SERVE OC) Study

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Introduction

- Food insecurity (FI) is a critical public health challenge in the United States, affecting nearly one in four Latino adults in the United States¹ and is associated with adverse mental and cognitive health outcomes.²
- Chronic stress from FI may trigger inflammation and gut dysbiosis, disrupting the gut–brain axis and affecting neural circuitry related to cognition and mood.³ Conversely, food security (FS) — reliable access to sufficient, nutritious food — may serve as a protective factor for both cognitive and mental health outcomes.
- Proposed Biological Pathways:**
 - Chronic stress and inflammation:** Persistent food insecurity activates the hypothalamic-pituitary-adrenal (HPA) axis, elevating cortisol and promoting pro-inflammatory cytokine release that can damage neural tissue over time.⁴
 - Gut dysbiosis and the gut–brain axis:** Poor dietary quality associated with food insecurity disrupts the gut microbiome, impairing bidirectional communication between the gut and brain and negatively influencing mood regulation and cognition.³
 - Nutrient deficiencies:** Inadequate intake of key micronutrients (e.g., B vitamins, omega-3 fatty acids, zinc) is associated with both depressive symptoms and accelerated cognitive decline.^{5,6}

Study Aim:

To examine the associations between food security (FS), depressive symptoms, and cognitive function among Latino families participating in the community-based Skills-based Educational strategies for Reduction of Vascular Events in Orange County (SERVE OC) study.

Methods

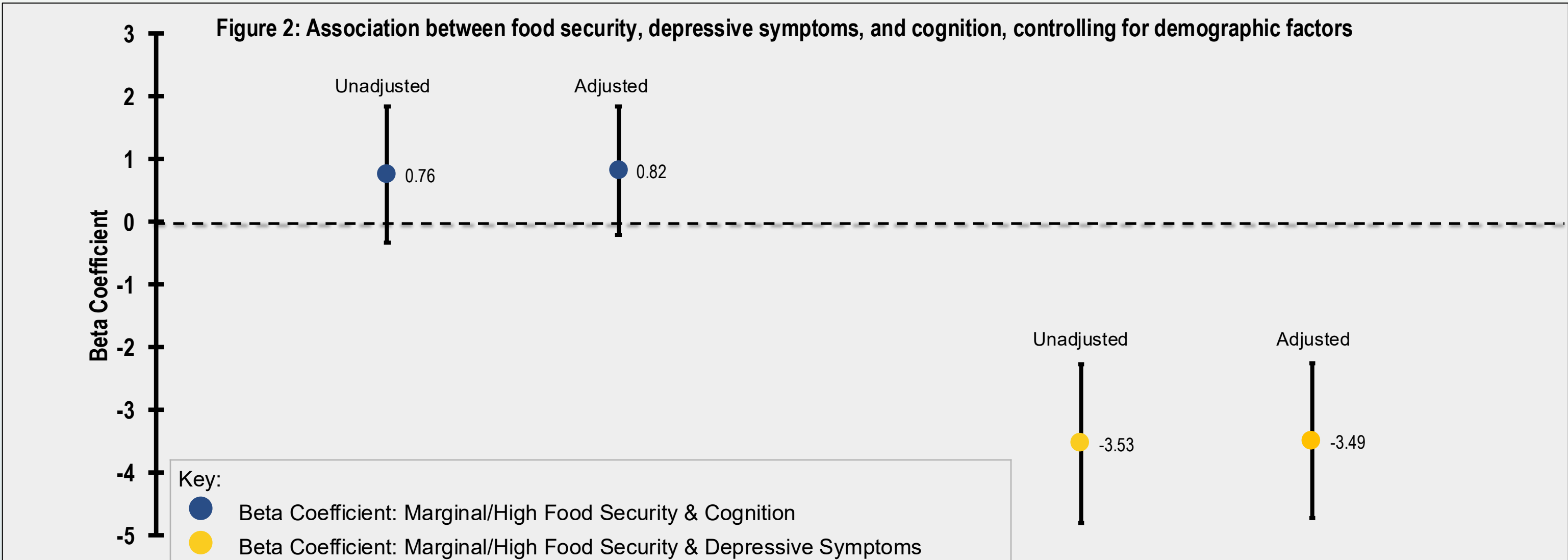
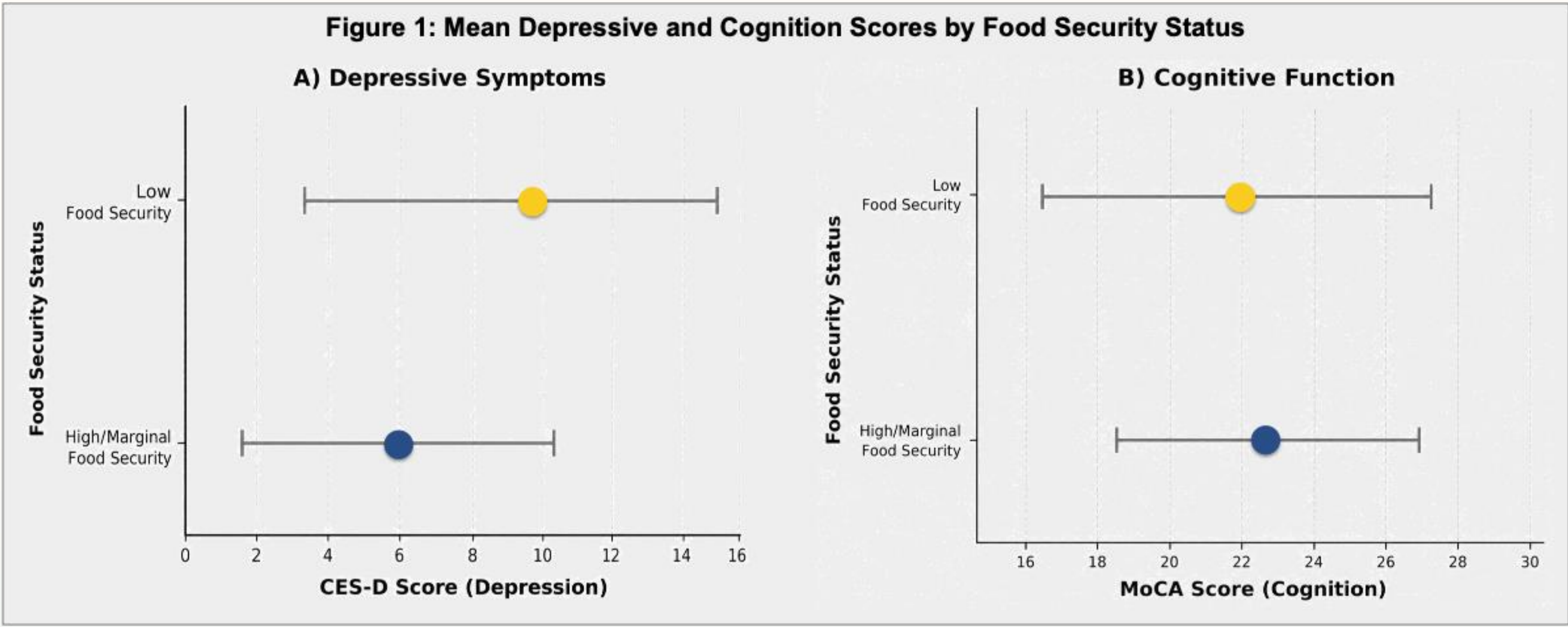
- Baseline data from the Skills Based Education strategies for Reduction of Vascular Events in Orange County (SERVE OC) RCT were used ([Grant: P50MD017366](#)).
- Baseline data from 131 randomized Latino families comprising 290 adults were used.
- Family-level FS** was self-reported and categorized as low versus high/marginal security.
- Cognitive function** was measured with the Montreal Cognitive Assessment (MoCA) 8.3 in English and Spanish, adjusted for education.
- Depressive symptoms** were assessed using the 10-item Center for Epidemiologic Studies Depressive Scale (CES-D-10).
- Descriptive statistics and t-tests were used to examine differences in depression and cognition across FS levels among participants with non-missing data.
- Linear regressions assessed the relationship between FS, cognitive function and depressive symptoms adjusting for key demographic factors age, sex, and education (≤8 grade or >8 grade)

Results

- Among respondents with FS data (N=290), 68.2% were female, with a mean age of 46.18 (SD=13.26) years.
- 87 (65.91%) families, representing 65.86% of all study participants reported low FS.
- Participants with low FS had significantly higher mean depressive symptoms (9.54 vs 6.01, p<0.05) and lower mean MoCA scores (21.90 vs. 22.66, p=0.17).
- After adjusting for select demographic factors, family FS status was not significantly associated with MoCA score ($\beta = 0.82$, $p = 0.12$), however low FS remained significantly associated with lower depression scores ($\beta = -3.37$, $p<0.001$).

Table 1: Baseline Demographic Characteristics of SERVE-OC Study Participants, Ages 18 and Older (N=290)	N (%)
Age, Mean (SD)	46.18 (13.26)
<50 years	166 (27.24)
≥50 years	124 (42.76)
Sex	
Male	91 (31.38)
Female	199 (68.62)
Education	
8th grade or less	111 (38.28)
More than 8 th grade	179 (61.72)
Preferred language	
English	43 (14.83)
Spanish	247 (85.17)
Food Security	
Low	191 (65.86)
High/Marginal	99 (34.14)
MoCA score, Mean (SD)	22.16 (4.45)
Depression score, Mean (SD)	8.35 (5.38)

*N (%) does not include missing data



Discussion / Conclusion

Key Findings:

- Low food security was **significantly and independently associated with greater depressive symptoms** in Latino adults, even after controlling for key sociodemographic factors
- A similar trend was observed for cognitive function (MoCA), but the association did not reach statistical significance after adjustment.

Implications for Policy & Practice:

- Findings underscore the need to recognize food insecurity as a critical social determinant of mental and brain health, particularly within underserved Latino communities where both food insecurity, depression, and cognitive decline are highly prevalent.
- Routine food security screening should be integrated into primary care, behavioral health, and community-based settings serving Latino adults and families, enabling early identification and referral to food assistance programs.
- Community-based programs that improve food access and nutritional quality may serve a dual protective role, simultaneously reducing depression risk and supporting long-term cognitive health in Latino communities.

Limitations & Future Directions

- The cross-sectional design precludes causal inference; future longitudinal studies are needed to examine temporal ordering and potential causal pathways between food insecurity, depression, and cognitive decline.
- Larger samples will be needed to detect cognitive effects of food insecurity with greater precision, and to explore whether these associations differ by sex, nativity, or acculturation level.

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