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Sreedhara M, Lopez-Cepero A, Rosal MC, Lemon SC. (2017). Do U.S. adults living in food insecure households experience poorer cardiovascular health?. UMass Worcester PRC Presentations. Retrieved from https://escholarship.umassmed.edu/prc_presentations/8

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Do U.S. adults living in food insecure households experience poorer cardiovascular health?



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UMass Center for Clinical and Translational Science Grant #UL1TR001453

Background

- Food insecurity impacts 15.6 million U.S. households.
- Relationships between food insecurity and individual cardiovascular disease (CVD) risk factors range from well-established to inconsistent and understudied:
 - Positive associations with poor glycemic control, tobacco use, and poor diet.
 - Positive associations with unhealthy weight for women.
 - Inconsistent evidence on links with hypertension, dyslipidemia and limited research on physical activity.

Objective

To quantify the extent to which food insecurity is associated with overall cardiovascular health in U.S. adults and to assess gender differences.

Methods

- Cross-sectional study design
- 1,446 National Health and Nutrition Examination Survey participants (2011-2012) met inclusion criteria (≥ 20 years old, not pregnant, without CVD, and complete exposure, outcome and covariate data)

Exposure

- USDA Adult Food Security Module 10-item questionnaire
- Affirmative responses were summed and dichotomized as food secure (≤ 2) or food insecure (≥ 3)

Outcome

- American Heart Association's Life's Simple 7 metric components achieved were summed:

Health Behaviors



Non-smoking^a
Never smoker or quit
> 12 months



Physically active^a
Meets federal guidelines
(≥ 150 min moderate, ≥ 75 min vigorous, or equivalent PA/week)

^a self-reported, ^b anthropometric & lab data, ^c untreated

Health Factors



Optimal plasma glucose^{b,c}
<100 mg/dL



Optimal total cholesterol^{b,c}
<200 mg/dL



Optimal blood pressure^{b,c}
<120/<80 mm Hg

Analysis

- Linear and logistic regressions to test associations between food insecurity and overall ideal cardiovascular health & individual components. Interaction between food insecurity and gender and ideal cardiovascular health was tested.

Results

- U.S. adults living in food insecure households compared to food secure households were younger (40.9 vs 47.4 years old) and a greater proportion were Non-Hispanic Black (15.9 vs 10.1%), Hispanic (22.0 vs 11.1%), had less than high school diploma (28.4 vs 11.5%), never married (29.2 vs 19.6%), and depressed (17.7 vs 5.1%) ($p < 0.05$)
- 15.8% of U.S. adults live in food insecure households
- No U.S. adults met all ideal cardiovascular health components

Figure 1. Percent of number of ideal cardiovascular health components achieved by food insecurity status*

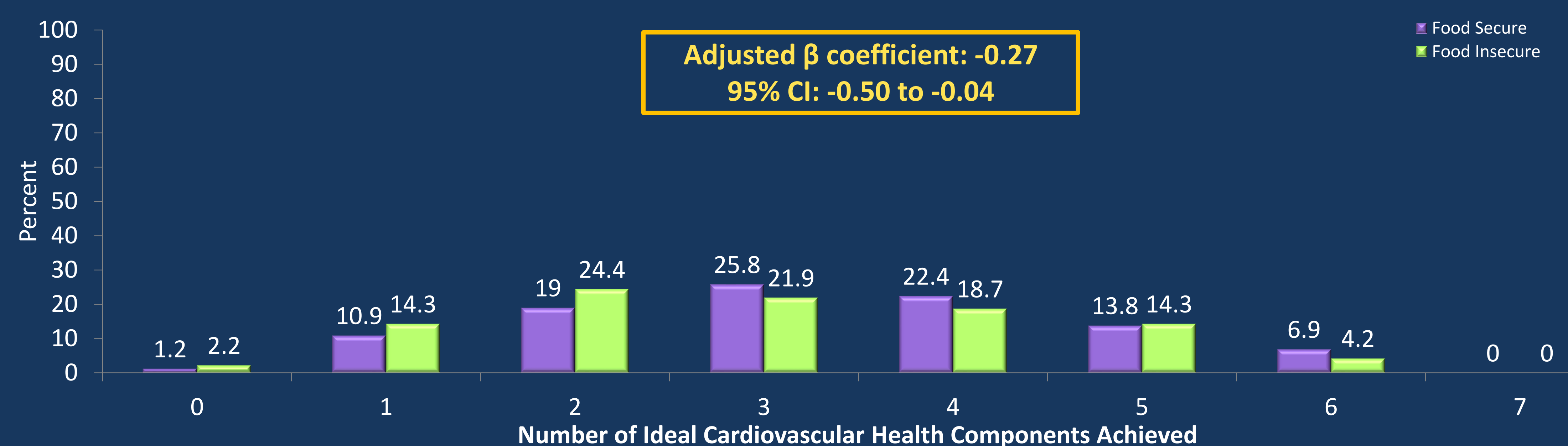
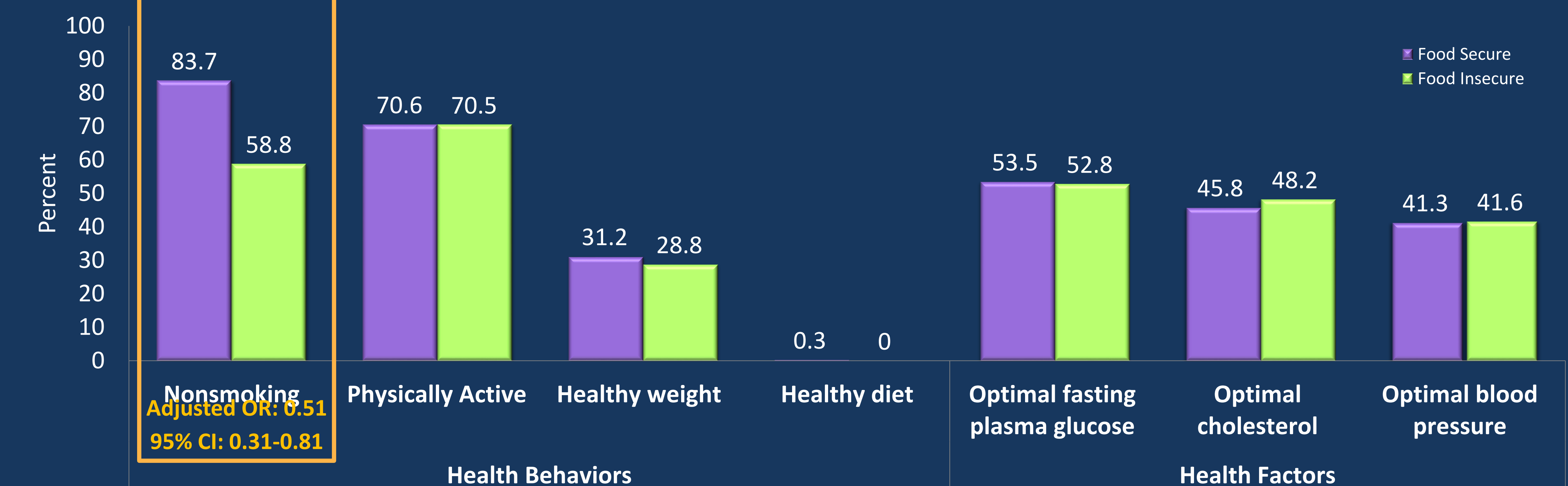


Figure 2. Percent of adults meeting individual cardiovascular health components by food insecurity status*



*Models adjusted for age, gender, race/ethnicity, education, marital status and mental health status & Tests for gender interaction were non-significant

Strengths

- Nationally representative sample
- USDA Food Security Module is valid and reliable
- Individual cardiovascular health components (i.e., anthropometrics & labs) may be less biased

Limitations

- Cross-sectional study design
- Measurement error may be present for self-reported indicators
- Potential for unmeasured confounding

Public Health Implications

A better understanding of the relationship between food insecurity and tobacco use is needed to inform effective interventions and policies.