

Jason M. Nagata, MD, MSc¹, Kartika Palar, PhD¹, Holly Gooding, MD, MSc², Andrea K. Garber, PhD, RD¹
Henry J. Whittle, MBBS, MS¹, Kirsten Bibbins-Domingo, MD, PhD, MAS¹, Sheri D. Weiser, MD, MPH¹

¹University of California, San Francisco, San Francisco, San Francisco, California
²Emory University, Atlanta, Georgia

BACKGROUND

- Food insecurity: limited or uncertain access to food resulting from inadequate financial resources
- Food insecurity associated with poor health outcomes in adults
- Limited data in young adulthood, important time period for development of chronic disease and mental health problems

OBJECTIVES

- To determine the association between food insecurity and health outcomes including chronic diseases and mental health:
- Poor general health, diabetes, hypertension, hyperlipidemia, obesity, obstructive airway disease, migraine, mental health, depression, anxiety, suicide, sleep

METHODS

Study Design

- National Longitudinal Study of Adolescent to Adult Health (Add Health): nationally representative sample of US
- Measures:** Wave IV (2008, 24-32 years)
- Predictor: Food insecurity (US Household Food Security Scale, 1st item)
- Outcomes: Self-reported physical and mental health outcomes
- Covariates: Age, sex, race/ethnicity, education, income, household size, smoking, alcohol
- Statistical Analysis:**
- Logistic regression analyses, adjusting for covariates
- Nationally representative sample weighting incorporated

RESULTS

- 14,800 young adult subjects
- Mean age was 28.3 years and 49% were female
- Racially/ethnically diverse sample
- 11% of young adults were food insecure
- Young adult women were more likely to be food insecure than men
- Prevalence of chronic diseases ranged from 2.6% for diabetes to 15.1% for obstructive airway disease.

RESULTS

Table 1. Demographic and health characteristics of 14,800 young adult participants in the National Longitudinal Study of Adolescent Health, stratified by food security status

	Total	Food Secure	Food Insecure	
n	14,800	13,139	1,647	
	Mean ± SE	Mean ± SE / % ^b	Mean ± SE / % ^b	p
Demographic characteristics	Mean ± SE / %			
Age, years	28.3 ± 0.1	28.3 ± 0.1	28.4 ± 0.2	0.395
Sex				<0.001
Female	49.3%	48.2%	57.6%	
Male	50.7%	51.8%	42.4%	
Race/ethnicity				<0.001
White (non-Hispanic)	65.6%	66.7%	58.0%	
Black/African American (non-Hispanic)	16.1%	14.8%	25.3%	
Hispanic/Latino	12.0%	12.2%	10.6%	
Asian/Pacific Islander (non-Hispanic)	3.4%	3.6%	1.5%	
American Indian/Native American	2.0%	1.8%	3.5%	
Other	1.0%	1.0%	1.0%	

All means and percentages are calculated with weighted data to reflect the representative proportion in the target U.S. population

Table 2. Association between food insecurity and health outcomes in young adults 24-32 years of age, adjusted for demographic variables and health behaviors

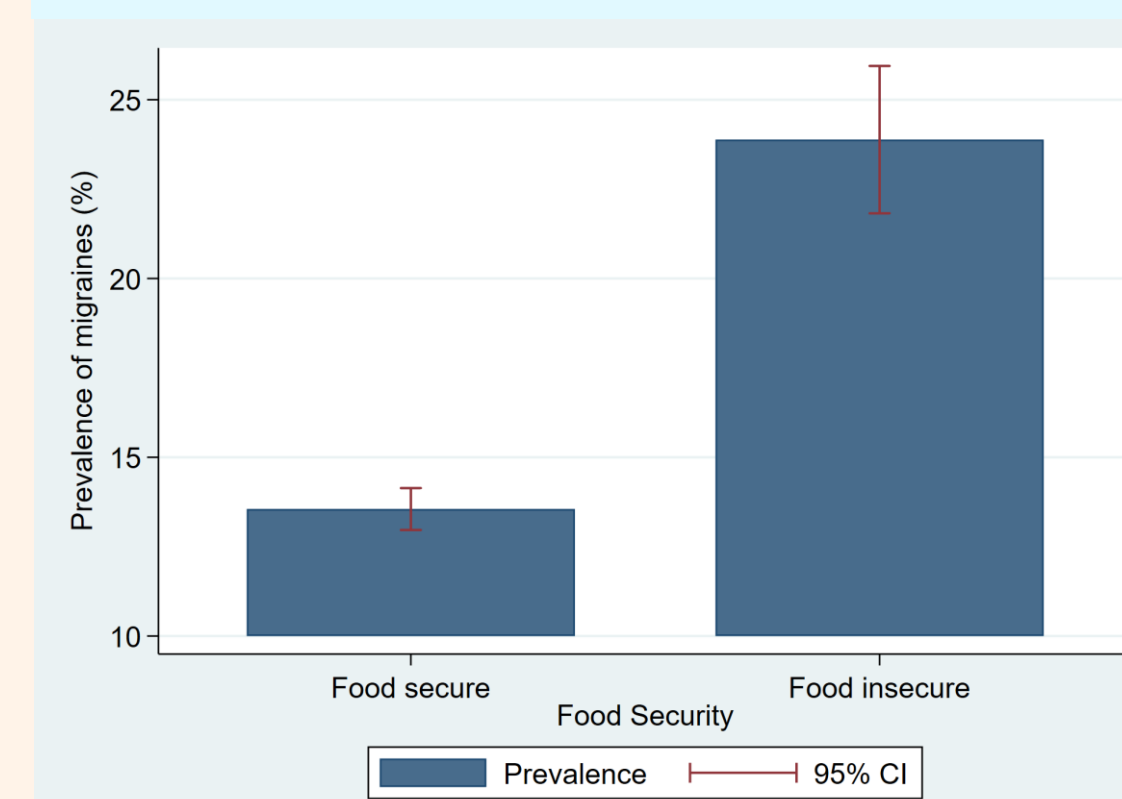
	Food Insecurity	
Health outcomes	Adjusted odds ratio ^a (95% CI)	p
Poor general health, self-report	2.65 (1.62 - 4.35)	<0.001
Chronic disease		
Diabetes, self-report	1.67 (1.17 - 2.40)	0.005
Hypertension, self-report	1.50 (1.22 - 1.84)	<0.001
Hyperlipidemia, self-report	1.08 (0.84 - 1.38)	0.562
"Very overweight," self-report	1.21 (1.01 - 1.45)	0.038
Obesity, measured body mass index	1.14 (0.99 - 1.31)	0.067
Obstructive airway disease, self-report ^a	1.44 (1.18 - 1.74)	<0.001
Migraine, self-report	1.68 (1.39 - 2.04)	<0.001
Mental health		
Depression, self-report	1.86 (1.55 - 2.23)	<0.001
Anxiety or panic disorder, self-report	1.60 (1.26 - 2.02)	0.001
Suicidal ideation in past 12 months, self-report	2.90 (2.27 - 3.71)	<0.001
Suicide attempt in past 12 months, self-report	1.69 (0.95 - 2.99)	0.074
Trouble falling asleep in past four weeks, self-report	1.69 (1.43 - 2.00)	<0.001
Trouble staying asleep in past four weeks, self-report	1.81 (1.55 - 2.11)	<0.001

^aAdjusted for age, sex, race/ethnicity, education, income, household size, smoking, and alcohol

^bIncludes asthma, chronic bronchitis, and emphysema

RESULTS

Prevalence of migraine by food security



- Food insecurity was not associated with inadequate disease control among those with diabetes or hypertension.
- Significant interaction between food insecurity and sex for obesity but not other outcomes

- Food insecure young adults had greater odds of self-reported poor general health (2.65, 95% Confidence interval [CI] 1.62-4.35) and chronic disease including diabetes (1.67, 95% CI 1.19-2.40), hypertension (1.50, 95% CI 1.22-1.84), "very overweight" (1.21, 95% CI 1.01 - 1.45), obesity (1.14, 95% CI 0.99-1.31), obstructive airway disease (1.44, 95% CI 1.18-1.74), and migraines (1.68, 95% CI 1.39-2.04) compared to young adults who were food secure in models adjusted for age, sex, race/ethnicity, education, income, household size, smoking, and alcohol.
- Food-insecure young adults had greater odds of mental health problems including depression (1.86, 95% CI 1.55-2.23), anxiety or panic disorder (1.60, 95% CI 1.26-2.02), suicidal ideation in the past 12 months (2.90, 95% CI 2.27-3.71), suicide attempts in the past 12 months (1.69, 95% CI 0.95-2.99), trouble falling asleep (1.69, 95% CI 1.43-2.00), and trouble staying asleep (1.81, 95% CI 1.55-2.11) in adjusted models.

CONCLUSIONS

- Food insecurity is a significant social determinant of poor physical and mental health in young adulthood
- Health care providers should screen for food insecurity in young adults and provide referrals when appropriate
- Future research should examine the association between food insecurity and health outcomes over the life course
- Develop early food insecurity interventions to prevent downstream effects on health in later adulthood, and test in controlled trials