

Food Insecurity is Related to Abdominal Obesity: Evidence from National Health and Nutrition Examination Survey (NHANES) 2017–2018



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Backgrounds

- Food insecurity is associated with a higher Body Mass Index (BMI).
- Using BMI to assess obesity has limitations because it fails to measure body fat distribution.
- Metabolic consequences of obesity are more strongly associated with visceral adiposity than general adiposity.
- The association between food insecurity and abdominal obesity [Waist Circumference (WC) and waist-to-hip ratio (WHR)] is not well understood.

Purpose

- To examine the relationship between food security status and BMI, WC, and WHR across four levels of food security:

(1) *High Food Security*

(2) *Marginal Food Security* (occasional access challenges)

(3) *Low Food Security* (limited access to adequate foods; food quality may be compromised)

(4) *Very Low Food Security* (severe food deprivation; food quality and quantity both compromised)

Methods

- **Study Design:** Secondary data analysis of the 2017-2018 NHANES, a cross-sectional, population-based national survey.
- **Participants:** (1) participants aged ≥ 20 , (2) who answered the food security questionnaire, and (3) who lived in households without children
- **Sample Size:** 5,549 adults
- **Measurements:**
 - Food Security Status: U.S. Adult Household Food Security Survey Module via in-person interviews
 - Adiposity Indicators: BMI, WC, and WHR collected by trained health technicians
 - Demographic Characteristics collected via in-person interviews
- **Statistical Analysis:** Multinomial logistic regression
 - Dependent variables: BMI, WC, and WHR categories
 - Independent variable: Food security levels
 - Covariates: Age, biological sex (male vs female), race, marital status, educational level, and economic status

Discussion

Conclusion

- Low food security was more strongly associated with having a higher BMI, WC, and WHR than high, marginal, or very low food security.
- The relationship between food security and abdominal obesity does not follow a simple linear pattern.

Implications

- Obesity prevention and developing tailored weight management programs aimed at individuals with low food security should be considered.

Future Directions

- Longitudinal designs with repeated measures, incorporating variables related to eating behavior (e.g., diet quality) and environmental factors and performing post-COVID-19 analysis are needed.

Results

	High Food Security Odds Ratio (%95 CI)	Marginal Food Security Odds Ratio (%95 CI)	Low Food Security Odds Ratio (%95 CI)	Very Low Food Security Odds Ratio (%95 CI)
General Obesity				
BMI				
Model 1 ^a	1	0.898 (0.728-1.106)	1.442 (1.016-2.046)*	0.817 (0.564-1.183)
Model 2 ^b	1	0.916 (0.653-1.285)	1.366 (0.995-1.875)	0.796 (0.502-1.261)
Abdominal Obesity				
WC				
Model 1	1	0.951 (0.661-1.369)	1.458 (1.088-1.954)*	1.030 (0.716-1.481)
Model 2	1	0.985 (0.675-1.438)	1.563 (1.213-2.014)*	1.019 (0.663-1.566)
WHR				
Model 1	1	1.183 (0.737-1.900)	1.515 (1.159-1.981)*	0.931 (0.581-1.491)
Model 2	1	1.409 (0.769-2.580)	1.929 (1.447-2.570)*	1.058 (0.651-1.720)

^aModel 1 was unadjusted, and ^bModel 2 was adjusted for covariates.

*Significant Odds Ratios are marked with a star and displayed in bold font.

- Nearly 22% of participants with overweight or obesity (BMI ≥ 25) were food insecure (low or very low food security).
- Approximately 22% of those with abdominal obesity (22.9% with higher WC and 22.1% with higher WHR) were food insecure.
- Low food security was significantly associated with higher odds of having higher WC and WHR.
- Although low food security was associated with higher BMI in bivariate analyses, it was not significant in the adjusted model.
- Marginal and very low food security were not significantly associated with the odds of having a higher BMI, WC, or WHR.



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