External Validation of National Sociodemographic Factors and Food Insecurity Among University Students

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Introduction

- Food insecurity (FI) is the limited or uncertain access to adequate, nutritious food due to financial constraints.[1]
- Approximately one-third of college students experience FI, exceeding the U.S. population prevalence.[2]
- Previous research identifies race/ethnicity, financial hardship, meal plan access, and public assistance participation as key risk factors.[3]
- Whether these findings generalize across universities remains unclear due to differences in student populations and campus environments.

Central Aim

- Externally validate previously-identified sociodemographic correlates of food insecurity among University of Pittsburgh college students.

Methods

- Secondary analysis of Fall 2024 University of Pittsburgh student survey data (N = 93).[4]
- Food insecurity was measured using the USDA Six-Item Short Form Food Security Survey Module (score: 0–8).
- Sociodemographic variables included age, gender, race/ethnicity, Pell Grant status, meal plan, SNAP, disability, employment, and financial characteristics.
- Descriptive statistics, bivariate analyses (Wilcoxon rank-sum, Kruskal-Wallis, Spearman correlation), and multivariable ordinal logistic regression were conducted in RStudio ($p < 0.05$).

Results

Sample Characteristics

- N = 93 University of Pittsburgh students (Table 1).
- Participants were predominantly female (74.2%) and White (72.0%).

Bivariate Analysis

- Pell Grant status, SNAP participation, campus pantry use, and payment source were significantly associated with food insecurity (Table 2).
- No other variables were significant.

Multivariable Ordinal Logistic Regression

- Black/Other students (Table 3) had 4.44× greater odds of higher food insecurity than White students (p = 0.012).
- Pell Grant recipients had 3.61× greater odds of higher food insecurity than non-recipients (p = 0.007).
- No other variables remained significant.

Highlighted Analyses

Table 1. The sample included students from diverse demographic and financial backgrounds, providing context for subsequent analyses of food insecurity. *N=93.*

Characteristic	n (%)
Female	69 (74.2%)
Male	15 (16.1%)
Nonbinary / non-conforming	9 (9.7%)
White	67 (72.0%)
Asian	15 (16.1%)
Black / African American / African	5 (5.4%)
Other or multiracial	6 (6.5%)
Hispanic ethnicity	8 (8.6%)
Disability	18 (19.4%)
Pell Grant recipient	19 (20.4%)
Meal plan	30 (32.3%)
SNAP recipient	6 (6.5%)
Campus pantry user	18 (19.4%)

Table 2. Bivariate analyses identified Pell Grant status ($p = 0.005$), campus pantry use ($p < 0.001$), SNAP participation ($p = 0.013$), and payment source ($p = 0.009$) as significant predictors of food insecurity.

Predictor	Statistical test	p-value	Significant
Age	Spearman correlation	0.996	No
Gender	Kruskal–Wallis	0.703	No
Race	Kruskal–Wallis	0.078	No
Hispanic ethnicity	Wilcoxon rank-sum	0.379	No
Disability	Wilcoxon rank-sum	0.597	No
Marital status	Kruskal–Wallis	0.641	No
Dependents	Wilcoxon rank-sum	0.165	No
Year in school	Kruskal–Wallis	0.111	No
Enrollment status	Wilcoxon rank-sum	0.165	No
Residence	Kruskal–Wallis	0.186	No
GPA	Kruskal–Wallis	0.759	No
Living situation	Kruskal–Wallis	0.210	No
Employment	Kruskal–Wallis	0.358	No
Pell Grant status	Wilcoxon rank-sum	**0.005**	**Yes**
Meal plan	Wilcoxon rank-sum	0.501	No
Pantry availability	Kruskal–Wallis	0.296	No
Pantry use	Kruskal–Wallis	**<0.001**	**Yes**
SNAP status	Kruskal–Wallis	**0.013**	**Yes**
Payment source	Kruskal–Wallis	**0.009**	**Yes**

Dependents and enrollment status should be interpreted cautiously because one comparison group contained only one participant.

Table 3. Multivariable ordinal logistic regression examining factors associated with higher food insecurity scores among University of Pittsburgh students.

Predictor	Adjusted OR	95% CI	p-value
Age, per one-year increase	0.94	0.83–1.07	0.311
Male vs Female	0.87	0.28–2.55	0.800
Nonbinary/non-conforming vs Female	1.68	0.43–6.22	0.439
Asian vs White	0.93	0.31–2.70	0.888
Black/Other vs White	**4.44**	**1.41–14.95**	**0.012**
Pell Grant recipient vs non-recipient	**3.61**	**1.43–9.27**	**0.007**
Meal plan vs no meal plan	0.53	0.22–1.23	0.144

Model adjusted for age, gender, collapsed race category, Pell Grant status, and meal plan status. Reference groups: Female, White, no Pell Grant, and no meal plan.

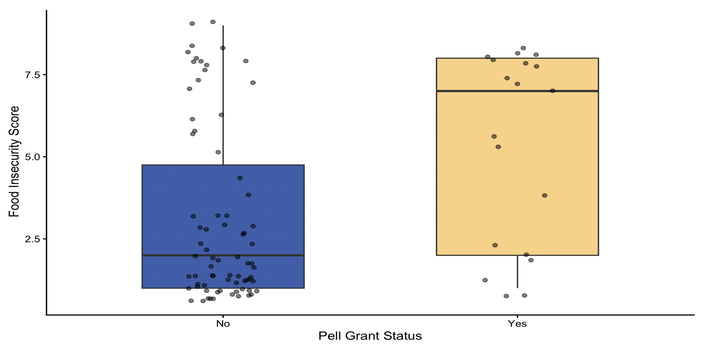

Figure 1. Distribution of food insecurity scores by Pell Grant status. Students receiving a Pell Grant demonstrated higher food insecurity scores than non-recipients.

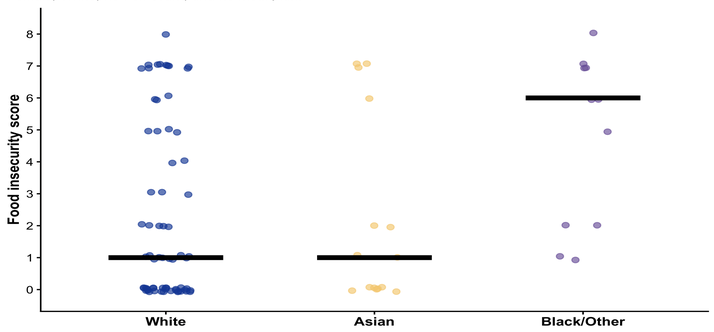

Figure 2. Food insecurity scores by race category. Students in the Black/Other race category had higher food insecurity scores than White students, consistent with the adjusted regression model.

"Students identifying as Black/Other had 4.4× greater odds of experiencing higher food insecurity than White students". [4]

Discussion

- Higher food insecurity was associated with Pell Grant status, SNAP participation, Pitt Pantry use, and limited payment sources.
- These findings are consistent with previous research linking financial hardship to FI among college students.
- After adjustment, Black/Other students had 4.44x higher odds of greater FI than White students.
- Pell Grant recipients had 3.61x higher odds of greater FI than non-recipients.
- SNAP participation and Pitt Pantry use were significant in bivariate analysis but not in the adjusted model.

Reflection

Limitations

- Small sample size may have limited statistical power.
- Self-reported data may introduce bias.
- Collapsed racial categories may mask subgroup differences.

Public Health Importance

- Identifies students at highest risk for FI.
- Supports targeted interventions for at-risk student populations.

Next Steps

- Recruit more participants to strengthen statistical power.
- Broaden population to include Ohio universities.
- Inform targeted support for Pell Grant recipients and marginalized students.

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Scan for References