

Food insecurity and food allergy in children: A cross-sectional study

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Clinical Implications

Data are limited on the impact of food allergies on food insecurity. Our study found increased odds of food insecurity among children with food allergy, which underscores the importance of assessing food insecurity in allergy practices.

Food insecurity refers to a lack of consistent access to sufficient food for an active and healthy life.¹ It is a serious condition that affects millions of children in the United States and is strongly associated with poor health and developmental outcomes.² In 2021, children were food-insecure in 6.2% of US households with children.¹ To promote food security, the American Academy of Pediatrics recommends universal screening for food insecurity in pediatric practices.²

A growing body of evidence suggests that households with food allergy are at higher risk for food insecurity.^{3,4} Significant economic costs are associated with managing childhood food allergy (estimated at \$4,184/child per year), which are driven in part by the cost of special diets and allergen-free foods.⁵ As a result, families with food-allergic children face additional financial challenges. In 2022, a work group report of the American Academy of Allergy, Asthma & Immunology called attention to this disparity and the lack of screening in allergy practices, but few studies to date have examined the association between food insecurity and food allergy, especially in children.⁶

This study describes the prevalence of food insecurity in food-allergic children of an urban community and examines the association between food insecurity and food allergy in children. We conducted a retrospective review of electronic health records (EHR) of all patients 6 months or older and under 18 years of age who were seen from October 2020 to June 2022 in the primary care pediatric clinic of NYC Health + Hospitals/ Kings County. General pediatricians at this clinic universally screen for food insecurity using a two-item tool adapted from Hager et al⁷ and recommended by the American Academy of Pediatrics.² The tool is composed of two screening questions: (1) Within the past 12 months, we worried whether our food would run out before we got money to buy more (yes or no); and (2) Within the past 12 months, the food we bought just didn't last and we didn't have money to get more (yes or no). These screening prompts are embedded in the EHR and required at every physician–patient encounter. If a child screens positive by answering yes to one or both questions, the physician documents the International Classification of Diseases, 10th Revision diagnosis code for food insecurity (Z59.41) in the EHR. Data on food insecurity and physician-diagnosed food allergy (Z91.01) were retrospectively collected based on International Classification of Diseases, 10th Revision diagnosis

TABLE I. Characteristics of study sample

Characteristic	Physician-diagnosed food allergy		P
	No = 7,581	Yes = 275	
Age			<.001
6-11 mo	114 (1.5)	2 (0.7)	
1-2 y	770 (10.2)	15 (5.5)	
3-5 y	1,413 (18.6)	37 (13.5)	
6-11 y	3,045 (40.2)	105 (38.2)	
12-17 y	2,239 (29.5)	116 (42.2)	
Gender			.933
Female	3,708 (48.9)	136 (49.5)	
Male	3,870 (51)	139 (50.5)	
Other*	3 (0.0)	0 (0.0)	
Race and ethnicity			.193
Asian/Native Hawaiian/Pacific Islander	85 (1.1)	2 (0.7)	
Black	6,423 (84.7)	247 (89.8)	
Hispanic/Latinx	459 (6.1)	12 (4.4)	
Native American/Alaskan Native	7 (0.1)	1 (0.4)	
Other†	352 (4.6)	10 (3.6)	
Multiracial	17 (0.2)	0 (0.0)	
Unknown	143 (1.9)	3 (1.1)	
White	95 (1.3)	0 (0.0)	
Health insurance			.160
Medicaid	5,623 (74.2)	201 (73.1)	
Children's Health Insurance Program	855 (11.3)	22 (8.0)	
Other public	314 (4.1)	15 (5.5)	
Private	780 (10.3)	37 (13.5)	
Uninsured	9 (0.1)	0 (0.0)	
Lives in low-income neighborhoods			.094
Yes	6,761 (89.2)	254 (92.4)	
No	820 (10.8)	21 (7.6)	
Lives in low–foodstore-access neighborhoods			.593
Yes	16 (0.2)	1 (0.4)	
No	7,565 (99.8)	274 (99.6)	

Data are presented as n (%). Bold indicates statistical significance ($P < .05$).

*Patients who did not identify as either female or male.

†Patients who identified with a race and ethnicity other than Asian/Native Hawaiian/Pacific Islander, Black, Hispanic/Latinx, Native American/Alaskan Native, White, or Multiracial.

codes. Data on self-reported food allergies were also collected from the EHR.

A total of 7,856 children were included in the study, mean age 8.7 years; 48.9% of children were female. Most children were Black (84.9%) and enrolled in Medicaid (74.1%). Most lived in low-income neighborhoods (89.3%), and 0.2% lived in low–foodstore-access neighborhoods (as defined by the US Department of Agriculture^{8,9} and based on ZIP code). Table I further describes the characteristics of the study sample.

TABLE II. Food insecurity among children with and without food allergy

Food allergy	Food insecurity		P
	No = 7,648	Yes = 208	
Physician-diagnosed food allergy			.029
Yes	262 (95.3)	13 (4.7)	
No	7,386 (97.4)	195 (2.6)	
Self-reported food allergy			.286
Yes	550 (96.7)	19 (3.3)	
No	7,098 (97.4)	189 (2.6)	
Self-reported multiple food allergies			.100
Yes	219 (95.6)	10 (4.4)	
No	7,429 (97.4)	198 (2.6)	
Self-reported peanut allergy			.687
Yes	221 (96.9)	7 (3.1)	
No	7,427 (97.4)	201 (2.6)	
Self-reported shellfish allergy			.102
Yes	165 (95.4)	8 (4.6)	
No	7,483 (97.4)	200 (2.6)	
Self-reported egg allergy			.138
Yes	70 (94.6)	4 (5.4)	
No	7,578 (97.4)	204 (2.6)	
Self-reported fish allergy			.174
Yes	182 (95.8)	8 (4.2)	
No	7,466 (97.4)	200 (2.6)	
Self-reported tree nuts allergy			.255
Yes	57 (95.0)	3 (5.0)	
No	7,591 (97.4)	205 (2.6)	
Self-reported milk allergy			.491
Yes	45 (95.7)	2 (4.3)	
No	7,603 (97.4)	206 (2.6)	
Self-reported soy allergy			.442
Yes	17 (94.4)	1 (5.6)	
No	7,631 (97.4)	207 (2.6)	
Self-reported wheat allergy			.552
Yes	13 (100.0)	0 (0.0)	
No	7,635 (97.3)	208 (2.7)	

Data are presented as n (%). Bold indicates statistical significance ($P < .05$).

As detailed in Table II, of the 275 children with a physician-diagnosed food allergy, 4.7% screened positive for food insecurity. Of the 7,581 children without a physician-diagnosed food allergy, 2.6% screened positive for food insecurity ($P = .029$). Children with a physician-diagnosed food allergy were more likely to have food insecurity than those without a physician-diagnosed food allergy, adjusted for age, gender, race and ethnicity, health insurance, and ZIP code (adjusted odds ratio = 2.21; 95% CI, 1.22-3.98).

We also found that children with self-reported food allergy and self-reported multiple food allergies may have higher rates of food insecurity. We observed a similar correlation for children with certain self-reported food allergies including peanut, shellfish, egg, fish, tree nuts, milk, and soy. However, unlike results for physician-diagnosed food allergy, these results were not statistically significant (Table II). An additional secondary analysis looking at the effects of demographic characteristics and comorbid conditions on food insecurity is provided in Tables E1

and Table E2 in this article's Online Repository at www.jaci-inpractice.org.

In summary, this study found increased odds of food insecurity among children with food allergy. These patterns underscore the importance of screening for food insecurity in allergy practices to inform families about and support children's access to nutrition assistance programs. Although the specific characteristics of this relatively small sample mean that findings may not be generalizable to US children, the results have broad implications for managing food allergy and health promotion efforts.

At NYC Health + Hospitals, children who screen positive for food insecurity are referred to social workers and a team of food navigators, who help patients access nutrition assistance programs. Some of these include the Supplemental Nutrition Assistance Program, the Special Supplemental Nutrition Program for Women, Infants, and Children, and the National School Lunch Program. NYC Health + Hospitals also use an EHR-integrated social service directory to streamline referrals to community resources. To provide more tailored support to patients, additional research is needed to understand why children with food allergy are more likely to experience food insecurity and why screening in allergy practices is limited. For example, future studies might consider mapping with more specificity the correlation between food allergy and each prong of the food insecurity screening tool. In addition, studies might consider adding questions to the screening tool to capture nuances in patients' experience with food insecurity. Researchers might also want to seek input from allergists about screening practices.

The availability of safe and healthy food is essential to the well-being of all children.² It is critical for us to continue to refine our understanding of the impact of food allergy on food insecurity and work to expand access to allergen-free foods, especially among children who face the double burden of food insecurity and food allergy.³ To mitigate disparities associated with food allergy, food insecurity screening should become routine in allergy practices in an effort to connect children and their families to crucial resources that can help support and improve their health and quality of life.⁶

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TABLE E1. Food insecurity among children with different characteristics

Characteristic	Food insecurity		P
	No = 7,648	Yes = 208	
Age			<.001
6-11 mo	101 (87.1)	15 (12.9)	
1-2 y	748 (95.3)	37 (4.7)	
3-5 y	1,403 (96.8)	47 (3.2)	
6-11 y	3,082 (97.8)	68 (2.2)	
12-17 y	2,314 (98.3)	41 (1.7)	
Gender			.831
Female	3,746 (97.5)	98 (2.5)	
Male	3,899 (97.3)	110 (2.7)	
Other*	3 (100.0)	0 (0.0)	
Race and ethnicity			<.001
Asian/Native Hawaiian/Pacific Islander	87 (100.0)	0 (0.0)	
Black	6,501 (97.5)	169 (2.5)	
Hispanic/Latinx	440 (93.4)	31 (6.6)	
Native American/Alaskan Native	8 (100.0)	0 (0.0)	
Other†	358 (98.9)	4 (1.1)	
Multiracial	17 (100.0)	0 (0.0)	
Unknown	143 (97.9)	3 (2.1)	
White	94 (98.9)	1 (1.1)	
Health insurance			<.001
Medicaid	5,678 (97.5)	146 (2.5)	
Children's Health Insurance Program	831 (94.8)	46 (5.2)	
Other public	328 (99.7)	1 (0.3)	
Private	802 (98.2)	15 (1.8)	
Uninsured	9 (100.0)	0 (0.0)	
Lives in low-income neighborhoods			.010
Yes	6,818 (97.2)	197 (2.8)	
No	830 (98.7)	11 (1.3)	
Lives in low—foodstore-access neighborhoods			.496
Yes	17 (100.0)	0 (0.0)	
No	7,631 (97.3)	208 (2.7)	

Data are presented as n (%). Bold indicates statistical significance ($P < .05$).

*Patients who did not identify as either female or male.

†Patients who identified with a race and ethnicity other than Asian/Native Hawaiian/Pacific Islander, Black, Hispanic/Latinx, Native American/Alaskan Native, White, or Multiracial.

TABLE E2. Food insecurity among children with different comorbid conditions

Comorbid conditions	Food insecurity		P
	No = 7,648	Yes = 208	
Asthma			.981
Yes	805 (97.3)	22 (2.7)	
No	6,843 (97.4)	186 (2.6)	
Eczema			.567
Yes	477 (97.0)	15 (3.0)	
No	7,171 (97.4)	193 (2.6)	
Obesity			.675
Yes	1,411 (97.5)	36 (2.5)	
No	6,237 (97.3)	172 (2.7)	

Data are presented as n (%).