Type 2 Diabetes: Nutritional Excess or Food Insecurity

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Conflict of Interest Disclosure

- Conflict of Interest
  - None
Objectives

• Explain the prevalence and severity of food insecurity in the United States

• Discuss the impact of food insecurity on children

• Identify methods for assessing food insecurity and providing appropriate education to families
Food Insecurity

- **USDA Definitions**
  - **Food Security**
    - *High food security*: no reported indications of food-access problems or limitations.
    - *Marginal food security*: one or two reported indications—typically of anxiety over food sufficiency or shortage of food in the house. Little or no indication of changes in diets or food intake.
  - **Food Insecurity**
    - *Low food security*: reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake.
    - *Very low food security*: Reports of multiple indications of disrupted eating patterns and reduced food intake.
Food desert: An area where affordable and nutritious food is difficult to obtain due to geographical access

No Car and No Supermarket Store Within a Mile

* SOURCE: Department of Agriculture, Centers for Disease Control

Map the Meal Gap – Feeding America

- Estimate how many people, including children, are food insecure in every county and congressional district in the country
- Estimate how many are likely to qualify for federal nutrition assistance programs
- Estimate how food prices vary from county to county
- Goal to improve understanding of food insecurity and food costs to develop target strategies
2018 Report on Food Insecurity

- 41 million people in United States are living in food insecure households  
  - 1 in 8
- 13 million children  
  - 1 in 6
- More than half of food insecure people live above the poverty line ($37,000 per year)

map.feedingamerica.org
Feeding America – Necessary Choices

- 69% food v. utilities
- 67% food v. transportation
- 66% food v. medical care
- 57% food v. housing
- 31% food v. education

Feeding America – Food Budget

- 79% purchase inexpensive, unhealthy food
- 53% receive help from friends or family
- 40% water down food or drinks
- 35% sell or pawn personally property
- 23% grow food in a garden
Effect of Food Insecurity on Children

- Physical and mental health
  - Delayed development in young children
  - Asthma and anemia
  - **Obesity, diabetes** and high blood pressure
  - Behavioral problems – hyperactivity, anxiety, aggression
- Academic achievement
- Social relationships
- Future economic prosperity

The Association between Food Insecurity and Obesity in Children—The National Health and Nutrition Examination Survey

Jubir Kass, MPH; Molly M. Lamb, PhD; Cynthia L. Ogden, PhD

**ABSTRACT**

Food insecurity can put children at greater risk of obesity because of altered food choices and inconsistent consumption patterns.

**Objective**

We examined the association between obesity and both child-level food insecurity and personal food insecurity in US children.

**Design**

Data from 3,511 participants in the National Health and Nutrition Examination Survey, 2011-2013, aged 2 to 11 years were analyzed. Child-level food insecurity was assessed with the US Department of Agriculture’s Food Security Survey Module based on eight child-specific questions. Personal food insecurity was assessed with five additional questions. Obesity was defined using physical measurements, as body mass index (calculated as kg/m²) greater than or equal to the age- and sex-specific 95th percentile of the Centers for Disease Control and Prevention growth charts. Logistic regressions adjusted for sex, race/ethnic group, poverty level, and survey year were conducted to describe associations between obesity and food insecurity.
Association Between Food Insecurity and Obesity

• Previous data shows inconsistent findings resulting from the fact that food insecurity is not measured in individual children
  – Household level v. personal food insecurity

• NHANES data
  – 9701 participants analyzed
  – In home family interview collecting demographic info and socioeconomic status (18 question USDA survey)
  – Private interview and physical exam

Kaur, J et al. 2015

Association Between Food Insecurity and Obesity

• Prevalence of obesity was higher among food insecure boys, girls, low income children and 6-11 year old children for both child level and personal level food insecurity

• Obesity significantly higher among 2-5 year old children with child level food insecurity, not personal level

• For child-level food insecurity, when separated by age group there was no longer a statistically significant association

• For personal food insecurity, when separated by age group there was still a statistically significant association for 6-11 year olds

Kaur, J et al. 2015
Association Between Food Insecurity and Obesity

- Reduced quality of food, reduced food intake, altered food choices and disrupted/non uniform eating patterns
- Periods of insufficient food leading to overconsumption when food is available
- Higher intake of fats, saturated fats, sweets and fried foods
- Greater intake of total energy, calcium and percentage of calories from fats and added sugar
  - Reliance on high energy dense foods

Kaur, J et al. 2015
Association Between Food Insecurity and Glycemic Control for Type 2 Diabetics

• 843 adult patients
• Results:
  – Deterioration of glycemic control for food insecure patients
  – Higher HgbA1C
  – Higher BMI
• Contributing factors: fewer years of completed education and unemployment associated with poor glycemic control

Bawadi et al. 2012

• 711 adult patients
• Results:
  – Deterioration of glycemic control for food insecure patients
  – Higher HgbA1C (>8.5)
• Contributing factors: food insecure patients more likely to report difficulty affording diabetic diet; lower diabetes specific self efficacy and higher emotional distress

Seligman et al. 2012

Food Insecurity, Food “Deserts,” and Glycemic Control in Patients With Diabetes: A Longitudinal Analysis

https://doi.org/10.2337/dc17-2061
Longitudinal Analysis 2013-2017

- 371 adult patients followed for a mean of 37 months
- 20% reported food insecurity
  – Participates more likely to be racial minorities, have Medicaid insurance and low education compared with those food secure
  – Patients had a greater number of outpatient follow ups during the study
- 31% resided in an area of low physical food access
- Food insecurity was associated with higher HgbA1C (0.6% difference, P<0.0001)
- Low physical access to food was not associated with HgbA1C

Berkowitz et al. 2018
What Can We Do?

• Awareness
  – Ask the right questions

• Education
  – Food choices
  – Food access and assistance programs

• Program development

Education

• Consult to registered dietitians
  – Help families to create healthy meals affordably
  – Assist in food choices within budget
  – Assist in choosing nutrient dense foods, rather than calorically dense foods that will keep them full – more “bang for your buck”

• Consult to social workers
• Education on services and programs available
Food Assistance Programs

**FEDERAL NUTRITION PROGRAMS**

“**Serve as critical supports for the physical and mental health and academic competence of children.**”

- American Academy of Pediatrics

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Cleveland Clinic Children’s
Food Assistance Programs

• SNAP
• WIC
• USDA Programming:
  – NSLP
  – SBP
  – Child and Adult Care Food Program
  – Summer Food Service Program
  – Fresh Fruit and Vegetable Program
  – After-School Snacks and Suppers

Food Assistance Programs

• Food Banks and Food Pantries
• Feeding America
  – Services >12 million children each year
• USDA community food systems website
• State Anti Hunger Organizations
Food Banks

• Donate: GreaterClevelandFoodBank.org
  • More than 15,000 volunteers help get food out to the community
• Help center:
  • Assists clients in applying for SNAP as well as 20 other assistance programs over the phone or in our office
  • Connects clients to pantries, hot meals and mobile pantries in their neighborhood

Food is provided to over 800 programs in the greater Cleveland area
15,300 children served in 2015 through programming
Cleveland Clinic ACTiVHOS

- **Activity, Cognitive Therapy, Incentives for Health Outreach to Students**
- **Office of Diversity and Inclusion, Cleveland Clinic Children’s, Endocrinology and Metabolic Institute**
- **Community partners: Esperanza Inc, YMCA, Thomas Jefferson school**
- Hispanic children represent the highest percentage of obesity rates at 26.1% compared with white children at 13.1% and African American children at 23.8%.
- **Goal:** We seek to engage youth to become physically active and inspire them to adopt healthy behaviors by incorporating fun, educational dialogues and fitness activities with incentive-based awards and prizes.

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**44109: Clark Fulton “Fast Food Row”**

*Food deserts* are communities that lack ready access to healthy, and affordable food or are served only by fast food restaurants and stores that offer little to no healthy, affordable food options.

Legend
- Schools
- Fast Food Restaurants
- Small Grocery

CMHA-West has some of the highest rates of adult obesity who are obese (10.3%), describe themselves as overweight (27.8%), and are trying to lose weight (41.2%).

In Cuyahoga County, Hispanic adolescents are amongst the most obese (26.7%), overweight (33.3%), self-described overweight (27.2%), and trying to lose weight (46.9%).

25-55% of households in the Clark Fulton neighborhood are without vehicles, and the same percentage of residents are food stamp recipients.

Additionally, the Clark Av/W 25th area scores as "worst outcomes" according to the Food Balance Theory. This suggests that residents are closer to fast food, a barrier from groceries.

Many CMHA-West adolescents eat fast food and drink soda (66.7%) at least once a week.

In Cuyahoga County, most Hispanic adolescents eat fast food (70.3%) and drink soda (67.7%) at least once a week.

26.6% of Hispanic adolescents in Cuyahoga County are school every day.

With fast food less than one mile from any school in the 25th area, the opportunity for daily interaction with food options is great, highlighting its nutritional.
Cleveland Clinic ACTiVHOS

• Community outcomes: Over 3 summers (2015-2017) reached 91 students ages 10-14
  – 40% of patients are overweight or obese
  – 10% underweight

• Spanish preferred: 60% of students

• Parents influenced

• School based outcomes: 2018 school year reached 31 immigrant children

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“I honestly want to thank you and your team for such a wonderful program! The students were very into it - logging their foods, exercise, and steps. They really started to try the fruits and vegetables that we are given 2 to 3 times a week through a grant program because you made them realize that trying it won’t kill you and it can actually taste really good. They have made a conscious effort to be more fit and walk more... They learned how to put together a healthy meal. For a population that has only been exposed to fast food/processed foods at the level the US has for only approximately 2 years they have already become addicted and they see how it has affected them... Please know that you have forever changed and touched 31 lives; 32 with me!” - 5th grade teacher
Addressing Food Insecurity: A Toolkit for Pediatricians

Two Primary Questions for LIPs to Ask

Question #1

Within the past 12 months, we worried whether our food would run out before we got money to buy more.

Question #2

Within the past 12 months, the food we bought just didn’t last and we didn’t have money to get more.
References/Resources