Food Insecurity's Relationship With Children's BMI And General Anesthesia

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BACKGROUND

- **Early Childhood Caries (ECC)** is the most common chronic disease in young children, especially in disadvantaged populations. It can lead to pain and infection, impacting eating, school attendance, and quality of life.
- **Food Security (FI)** In 2023, 13.5% of U.S. households were food insecure at least some time during the year, and 38.7% of households with incomes below the Federal poverty line were food insecure .
- **Childhood Obesity and BMI** : Children growing up in low-income households tend to exhibit higher levels of obesity than those from financially stable households.
- **General Anesthesia**: Due to the case severity or the patient's inability to cooperate, treating these patients in a normal dental setting may be difficult. Performing dental treatment under GA (general anesthesia) may provide a suitable solution for these unique cases.

OBJECTIVES

Objective: This study aimed to examine if children in FI households would present with higher BMI, have more extensive dental needs and be more likely to require dental treatment under GA.

Hypotheses:

H_1: There is a relationship between food security status and BMI

H_2: There is a relationship between food security status and the need for GA

METHODS

This cross-sectional study included patients (ages 3-17) receiving dental care at the University of Illinois Chicago (UIC) College of Dentistry (COD) and their guardian.

- A Qualtrics survey, which included demographic questions, availability of food, access to food, utilization of food, stability, and a social work follow-up request, was completed by the patient's legal guardian during their dental exam or operative appointment.
- Data regarding the child's caries status, BMI, and need for GA were abstracted from their electronic dental records.
- Descriptive statistics, bivariate analysis, and a logistic regression model were conducted with a significance threshold set at P<0.05.

Inclusion Criteria
- Legal guardians of new and returning patients (ages 3-17) receiving dental care at UIC COD
- Caregivers who can read and understand English
- Children ages 3-17 years receiving dental care at UIC COD

Exclusion Criteria
- Caregivers who can not read and understand English
- Children who are: Younger than 3 and older than 17, and deemed to have uncooperative behavior

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RESULTS

Demographics

Variable	Overall (N=251)
Child Age	
Mean (SD)	7.3 (3.0)
Median (Range)	7.0 (2.0, 19.0)
Child Gender	
Female	138 (55.4%)
Male	111 (44.6%)
Child Ethnicity	
Not Hispanic or Latino	98 (39.4%)
Hispanic or Latino	151 (60.6%)
Child Race	
White	87 (36.2%)
Black/African American	55 (22.9%)
Asian	11 (4.6%)
American Indian/Alaskan Native	8 (3.3%)
Pacific Islander	1 (0.4%)
Other	78 (32.5%)

Demographics

Variable	Overall (N=251)
Child Citizenship Status	
US Citizen	207 (84.1%)
Non-Citizen	39 (15.9%)
(Missing/No Response)	5
Total Number of People in Household	
(Missing/No Response)	2
2	12 (4.8%)
3	43 (17.3%)
4	73 (29.3%)
5	66 (26.5%)
6+	55 (22.1%)
Adults in Household Helping Care for Child	
(Missing/No Response)	2
1	74 (29.7%)
2	147 (59.0%)
More than 2	28 (11.2%)
Caregiver Education Status	
(Missing/No Response)	4
No high school	5 (2.0%)
Some high school	18 (7.3%)
High school diploma or GED	101 (40.9%)
Some college	77 (31.2%)
College graduate	39 (15.8%)
Some graduate school	7 (2.8%)

Bi-variate Analysis

	No GA	GA	
Child Age			<0.001
Median (Q1, Q3)	8.0 (6.0, 10.0)	5.0 (4.0, 7.0)	
Child Dentition			<0.001
---Primary	29 (37.2%)	49 (62.8%)	
---Mixed	99 (69.7%)	43 (30.3%)	
---Permanent	27 (90.0%)	3 (10.0%)	
DMFT Score			< 0.001
---Median (Range)	3.0 (0.0, 19.0)	3.0 (1.0, 20.0)	
---Q1, Q3	1.0, 7.0	2.0, 11.0	
DMFT Severity Scale			< 0.001
---Low Severity DMFT, 0-24%	48 (31.0%)	2 (2.1%)	
---Moderate Severity DMFT, 25-49%	68 (43.9%)	28 (29.5%)	
---High Severity DMFT, 50-74%	31 (20.0%)	38 (40.0%)	
---Extreme Severity DMFT, 75-100%	8 (5.2%)	27 (28.4%)	

Logistic Regression Model

Variables	Odds Ratio	95% Confidence Interval	p-value (critical alpha >0.05)
Food Insecurity Score	1.14	(1.03,1.25)	p= 0.02257
DMFT Scale: Moderate Severity DMFT, (25-49%)	11.22	(9.65, 12.79)	p= 0.00252
DMFT Scale: High Severity DMFT (50-74%)	25.06	(23.46, 26.66)	p= 0.00008
DMFT Scale: Extreme Severity DMFT (75-100%)	83.56	(81.77, 85.36)	p= 0
Child's Age	0.8	(0.57,1.01)	p= 0.042

FOOD INSECURITY SEVERITY SCORE

- High Food Security (0)
- Marginal Food Security (1-2)
- Low Food Security (3-7)
- Very Low Food Security (8-18)

0%, 7%, 26%, 67%

BMI CATEGORY

- Underweight
- Healthy
- Overweight
- Obese/Severely Obese

2%, 22%, 20%, 56%

DMFT SEVERITY SCORE

- Low Severity DMFT, 0-24%
- Moderate Severity DMFT, 25-49%
- High Severity DMFT, 50-74%
- Extreme Severity DMFT, 75-100%

20%, 38%, 28%, 14%

NEED FOR GENERAL ANESTHESIA

- No GA
- GA
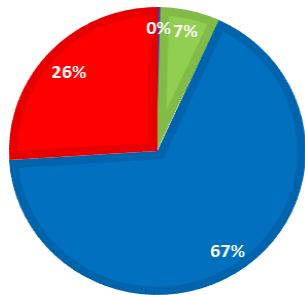
38%, 62%

Bi-variate Analysis Results

- Younger age, primary dentition, and higher DMFT scores were associated with increased need for GA (p<0.001).

Logistic Regression Results

- Higher food insecurity, DMFT category, and younger age were associated with higher odds of GA.
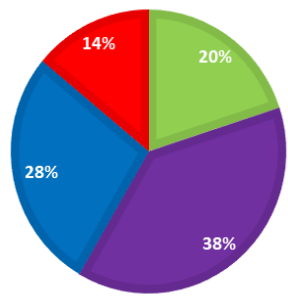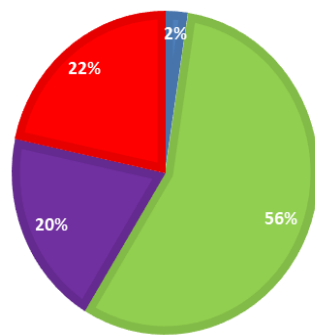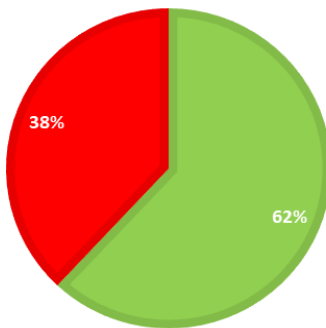
CONCLUSIONS

- While it was not found that food insecurity was associated with BMI levels, 93% of our study population presented with low or very low food security and over half did not have a healthy BMI, indicating that targeted interventions are needed in this population.
- Younger children were more likely to have increased dental needs and to require GA for their treatment. The importance of early dental visits and prevention should be reinforced in this population.
- The data revels that higher levels of food insecurity may be an indicator for increasing odds of children needing GA.
- Additional studies are needed in more diverse patient populations to further examine this association.

References