

Risk Profiles of Overweight/Obesity among Preschoolers

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Introduction

A small number of studies has established risk profiles of childhood obesity by examining the combined effect of pre-and-postnatal maternal factors as well as children's characteristics on childhood overweight/obesity.

Purpose

This study used classification and regression tree (CART) analysis to examine the combined effect of maternal and child factors in generating risk profiles for overweight/obesity among preschoolers.

Methods

DATA

Data from The Early Childhood Longitudinal Study–Birth Cohort (ECLS-B) study were used. The sample was comprised of Preschool children (≈4 years old).

OUTCOME VARIABLE

Children's body mass index (BMI)-for-age was calculated. Two BMI-for-age categories were constructed based on the CDC definitions for normal BMI (5^{th} to $< 85^{th}$ percentile) and overweight/obese ($\geq 85^{th}$ percentile).

PREDICTORS

Maternal race, age, SES, marital status, pregravid BMI, parity, tobacco use, breastfeeding duration, child's gender, gestational age, birth weight, BMI at age 2 years.

STATISTICAL ANALYSIS

Data were weighted to account for design effects and oversampling. Logistic regression and CART analyses were conducted.

CART

CART is a recursive partitioning method that divides the entire sample space into binary subsamples by seeking variable splits that produce homogeneous subgroups. The classification tree in this study was built using the CART software.

Descriptive Analysis

Table 1. Distribution (%) of maternal and child characteristics

Children's BMI status			
	Normal (%)	Overweight/Obese (%)	P-value
Maternal race/ethnicity			
White	65.6	34.2	0.00
Black	61.6	38.4	
Hispanic	55.4	44.6	
Maternal age			
<20 yrs	61.8	38.2	0.55
20-34	63.1	36.9	
>34	66.4	34.6	
Maternal status			
Married	65.4	34.6	0.00
Not married	58.9	41.1	
SES	59.9	41.2	
Low	58.8	41.2	0.00
Medium	62.0	38.0	
High	71.4	28.6	
Parity prior to current pregnancy			
0	62.6	37.4	0.70
1	63.2	36.8	
≥2	64.6	35.6	
Pregavid BMI			
Normal	60.1	39.9	0.00
Overweight/obese	53.6	46.4	
Smoking			
No	64.2	35.8	0.02
Yes	56.1	43.9	
1 (9.2.7)	1.7 (2.7)	1.7 (2.5)	
Child's gender			
Male	63.1	36.9	0.84
Female	63.3	36.7	
Birth weight			
<2500 grams	72.9	27.1	0.00
2500-3900 grams	64.1	35.9	
≥4,000 grams	48.7	51.3	
Gestational age			
<37 weeks	66.0	34.0	0.00
37-42 weeks	62.8	37.1	
BMI at age 2 years			
Normal	76.6	24.4	0.00
Overweight/obese	38.9	60.1	

These are mean and standard deviation in the parentheses

Key Findings

- Overweight/obese children were more likely to have mothers who were not married, belonged to low SES, were overweight/obese prior to pregnancy, and smoked during pregnancy.
- A higher proportion of children born to Hispanic mothers were overweight/obese compared to those born to white or Black mothers.
- Children with high birth weight (≥ 4000 gm.) were also more likely to be overweight/obese at age four if they were born to mothers with a normal pregravid BMI but were of a lower SES.
- Among preschoolers whose mothers were black or white and who had a high pregravid BMI, breastfeeding duration and parity played an important role in determining their risk of being overweight/obese.

Results

CART Analysis

Figure 1. Classification tree identifying profiles of overweight/obese preschoolers. Class 1 indicates normal and class 2 indicates overweight/obese preschoolers. The single asterisk indicates the class name while the double asterisk indicates the terminal node (a node that cannot be subdivided any further)

