Childhood Obesity, Food Access & Nutrition

ECHO
Environmental influences on Child Health Outcomes
A program supported by the NIH

September is National Childhood Obesity Awareness Month

Obesity, diabetes, and cardiovascular diseases in adulthood may be linked to **early life exposures**, including during pregnancy, birth, and early childhood.

ECHO study, **Preterm babies** with very high weight gain after NICU discharge, had higher body mass index (BMI) scores and a **higher risk of obesity at 12-48 months.**[2]

PFAS, also known as "forever chemicals", are found in food, water, and many household items. A recent ECHO study shows that higher levels of **PFAS exposure during pregnancy** were linked to slightly **higher BMIs in children and increased risk of obesity.**[1]

ECHO investigators found that **living in low-income-low-food-access neighborhoods** during pregnancy or early childhood was associated with a higher body mass index (BMI) for the child at ages 5 and 15 years. It was also associated with a **50% greater chance of developing obesity or severe obesity at ages 5, 10, and 15 years.** [3]

Low-income-low-food access neighborhoods are defined as:
low-income neighborhoods where a third or more residents live more than one mile from a grocery store in urban areas or more than 10 miles in rural areas.

For questions on these findings or other ECHO Program activities, please email NIHKidsandEnvironment@od.nih.gov

National Institutes of Health
Environmental influences on Child Health Outcomes (ECHO)

ECHO Research:
Nutrition during pregnancy

- Most **pregnant people in the U.S. are at risk of not getting enough of nutrients** like vitamin A, vitamin D, folate, calcium, iron, and omega-3 fatty acids from foods alone.[4]
- **During pregnancy**, living in neighborhoods where residents have lower incomes or **limited food access** was associated with having **babies with lower birthweights** and an increased risk of babies born small for gestational age.[5]
- An ECHO study **analyzed over 20,000 dietary supplements** for pregnant people and found that only one may have the optimal amounts of ADA recommended nutrients.[6]
- **Investigators identified over 2,300 low-calorie foods** with at least one of the six nutrients important in pregnancy.[7]
- ECHO researchers also reported that around **25% of pregnant participants did not eat any fish or ate it less than once per month.**[8]

Publications and Citations

1. Liu, Yun, et al. "Associations of gestational perfluoroalkyl substances exposure with early childhood BMI z-scores and risk of overweight/obesity: results from the ECHO cohorts." *Environmental health perspectives* 131.6 (2023): 067001.
2. O'Shea, T. Michael, et al. "Association of Growth During Infancy with Neurodevelopment and Obesity in Children Born Very Preterm: The Environmental Influences on Child Health Outcomes Cohort." *The Journal of Pediatrics* 271 (2024): 114050.
3. Aris, Izzuddin M et al. "Neighborhood Food Access in Early Life and Trajectories of Child Body Mass Index and Obesity in ECHO". *JAMA Pediatrics* (2024).
4. Sauder, Katherine A et al. "Disparities in Risks of Inadequate and Excessive Intake of Micronutrients during Pregnancy." The Journal of nutrition vol. 151,11 (2021): 3555-3569. doi:10.1093/jn/nxab273
5. Aris, Izzuddin M et al. "Birth outcomes in relation to neighborhood food access and individual food insecurity during pregnancy in the Environmental Influences on Child Health Outcomes (ECHO)-wide cohort study." The American journal of clinical nutrition vol. 119,5 (2024): 1216-1226. doi:10.1016/j.ajcnut.2024.02.022
6. Sauder, Katherine A., et al. "Selecting a dietary supplement with appropriate dosing for 6 key nutrients in pregnancy." The American journal of clinical nutrition 117.4 (2023): 823-829.
7. Sauder, Katherine A et al. "Identifying Foods That Optimize Intake of Key Micronutrients During Pregnancy." The Journal of nutrition vol. 153,10 (2023): 3012-3022. doi:10.1016/j.tjnut.2023.08.012
8. Oken, Emily et al. "Demographic and health characteristics associated with fish and n-3 fatty acid supplement intake during pregnancy: results from pregnancy cohorts in the ECHO programme." Public health nutrition vol. 27,1 e94. 27 Feb. 2024, doi:10.1017/S136898002400051X

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