

# Maternal Employment and Childhood Obesity

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## Background

Childhood overweight may be one of the most significant health issues facing American children today. In the 1963 to 1970 period, 4 percent of children between the ages of 6 and 11 were defined as overweight; that level had more than tripled by 1999, reaching 13 percent. The rise in women working outside the home coincides with the rise in childhood weight problems. From 1970 to 1999, the fraction of married women with children under 6 who participate in the labor force doubled, rising from 30 to 62 percent, while those with children ages 6 to 17 rose dramatically from 49 to 77 percent. However, time series evidence is not sufficient to imply that these trends are related. This study explores whether the rise observed in both maternal employment and childhood overweight represents a causal relationship between these two phenomena.

## Methods and Findings

Using matched mother-child data from the National Longitudinal Survey of Youth (NLSY), the authors employ several econometric techniques to identify whether the relationship between maternal employment and childhood overweight reflects more than a spurious correlation. First, they estimate models relating the likelihood of a child's being overweight on a full range of observable characteristics of the mother and child. Second, they estimate models explaining the change in overweight status over time so as to eliminate any unobserved child-specific and family-specific fixed effects. Finally, they estimate instrumental variables models, using as instruments the variation between States and over time in the unemployment rate, child care regulations, wages of child care workers, welfare benefit levels, and the status of welfare reform in the States. The models were also estimated separately by income, maternal education, and race/ethnicity subgroups.

The key outcome variable, an indicator for whether the child is overweight, is based on the child's Body Mass Index (BMI). Children with a BMI above the age- and sex-specific 95<sup>th</sup> percentile of the BMI growth chart are classified as "overweight." The authors also capture the child's lifetime exposure to maternal employment through measures such as total weeks worked per year and average hours worked per week, distinguishing between mothers who work at a high intensity, but intermittently, from those who work consistently, but at a lower intensity.

Their results suggest that a 10-hour increase in average hours worked per week will increase the overall probability a child is overweight by 0.5 to 1 percentage point. In the probit models, the point estimate on hours per week

is always positive and increases with income quartile. For mothers in the highest socioeconomic status, the results indicate that a 10-hour increase in average hours worked per week since a child's birth increases the likelihood that the child will be overweight by 1.3 percentage points. Children of more highly educated mothers are significantly more likely to be overweight if their mothers work more hours per week. Overall, the subgroup analyses show that the intensity of mother's work over the child's lifetime has a positive effect on a child's likelihood of being overweight if the child is in a high-income family, with a well-educated or White mother. For these subgroups, a 10-hour increase in average hours worked per week over a child's life is estimated to increase the likelihood that the child is overweight by between 1 and 4 percentage points, depending on the specification. The relationship between number of weeks worked and childhood overweight is insignificant throughout.

Several other results are worth noting. Black children are significantly more likely to be overweight than other groups. Mother's education by itself is negatively and significantly related to the probability that her child is overweight—an extra year of education reduces the probability that a child will be overweight by 0.6 percentage point. Moreover, children who are breastfed are about 2.3 percentage points less likely to be overweight. The interpretation of this finding is unclear: Breast milk may have nutritional value that affects children's health later in life, or mothers who breastfeed may simply be more attentive to their children's nutrition throughout the children's lives. Mother's weight is also found to have a large positive impact on children's weight status.

The results suggest that the mechanism through which maternal employment affects childhood overweight is constraint on the mother's time; hours per week (i.e., intensity of work), not the number of weeks worked, affect children's probability of overweight. The increase in the mother's time constraints may lead to behavioral changes affecting the child's nutrition and physical activity, such as the mother's greater reliance on calorie-dense convenience foods and her lack of time for supervising vigorous play outside. Moreover, the authors demonstrate the importance of examining explanations for childhood overweight separately for subgroups. Working more hours per week only has a deleterious effect on the weight of children in higher socioeconomic status households.

## Discussion

Given the limited information in the NLSY data set, the use of the word “causal” should be interpreted carefully. If there is a systematic underlying relationship, it is presumably because working mothers are feeding fast or energy-dense foods to their children and/or not monitoring their physical activities. Because the data on nutrient intakes and physical activity are unavailable in NLSY, these pathways cannot be explicitly included and tested in the models.

Furthermore, modeling the BMI or weight may have been preferable to modeling the indicator of overweight that requires a cutoff point for being overweight (the outcome variable in this paper is a binary variable equal to 1 if the child's BMI is above the 95<sup>th</sup> percentile for his/her age) and is

controversial for children. Ideally, one would prefer to measure overweight using a measure that reflects adiposity. Because doing so is impractical in large-scale surveys, researchers have employed the BMI, which only requires the measurement of height and weight. It is somewhat questionable when used to assess overweight among children, who experience growth spurts at individual-dependent ages that can weaken the relationship of height- and weight-based measures to adiposity. Moreover, instrumental variables estimation can be interpreted more easily when the dependent variable is continuous.

The results clearly show that Black and Hispanic children are heavier. When the authors run the regressions separately for the three race groups, they find that maternal employment significantly predicts higher weight only for White children. This finding does not imply that we do not need to be concerned about weight gain in Black and Hispanic communities, which may be a more serious problem. Because of the focus on the “causal” effects of maternal employment, less attention has been paid to the role of dietary or activity habits among minorities that lead to weight gain. Such households may need nutrition education and advice. By contrast, White women working long hours likely put their children at greater risk of weight gain because time constraints lead to a less healthy life style. The issues of absolute differences between the races, and also between the education groups, demand further investigation using models for BMI and allowing for several interaction terms.

## Future Research

This paper is among the first to grapple with issues of causality and lays the groundwork for future research into the causes of childhood overweight. Further work is required to understand fully the mechanisms through which mothers’ working translates into overweight children. For example, how does child care quality affect children’s nutrition and energy expenditure? Will better nutritional information for parents promote children’s health? A deeper understanding of other direct contributors to childhood overweight is also imperative. For example, we need to know more about children’s opportunities for vigorous exercise, including physical education in school, after-school programs, and access to parks or other recreational facilities.

Modeling the length of breastfeeding as a function of hours of maternal employment would be useful. However, the NLYS data may lack information on the number of months the child was breastfed and may contain only a 0-1 indicator. Nevertheless, estimating a model to see if the probability of breastfeeding is reduced by maternal employment may be useful. Supplementary feeding at an early age is a possible pathway through which children may gain weight.

We also need to understand how working mothers select foods, the amount of time they spend at fast-food restaurants, and whether these mothers increase their household consumption of processed foods (i.e., foods with long shelf lives that are quick to prepare) as opposed to fast foods. Furthermore, fast food is a low cost way to obtain deep-fried food, and technological advances in food processing may be driving the trend in childhood overweight instead of time constraints. Fast food tends to be very calorie

dense because of the deep frying involved in its preparation. The demand for fat and sugar has always existed, but technology has made the relative price of fat and sugar lower, stimulating their increased consumption.

To design more effective public policy to curb the obesity epidemic, a more detailed understanding is necessary on how children's lives have changed in recent decades and how these changes affect their intake and output of energy. Children spend the bulk of their time away from home in school. Has the school environment changed in ways that contribute to childhood obesity? Almost half of high school students have no access to physical education classes, and only one-third have daily classes. Almost all high school students have access to vending machines, and about one-quarter are served brand name fast foods in school. Cash-strapped schools have turned to contracts with soft drink and vending companies to increase their budgets, although legislators have recently begun to restrict such deals. Policies that encourage a parent to stay at home are unlikely, so school-based interventions may be more effective. A better understanding of how school finance policies affect school physical education, food, and beverage decisions is needed. Perhaps more important, given recent legislative debates, the way these choices affect children's health is an open question that needs study.