

The Impact of Early Care and Education in Child Nutrition, Sedentary Behavior and Obesity by Kindergarten

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Project Description.

The early care and education (ECE) environments of children offer a potentially critical setting for curbing the epidemic levels and marked disparities in obesity in the U.S. by race/ethnicity, nativity and socioeconomic status. Subsidized care funded through the Child Care and Development Fund (CCDF) provides one such mechanism for targeting minority and low income children and, along with Head Start (HS), is the federal government's largest investment in ECE. To date, however, the evidence about the role of subsidized care, HS and other ECE environments in child obesity is currently insufficient to guide policy. Lacking a nationally-representative experimental trial, the next best option for developing national insights about the role of HS and subsidized care in curbing child obesity is to employ longitudinal, nationally-representative observational data. We employ two such data sources, the 2006 Head Start Family and Child Experiences Survey (FACES) and the Early Childhood Longitudinal Study Birth Cohort (ECLS-B) to study change in children's body mass index (BMI) z-scores. We evaluate pooled-survey methodologies and quasi-experimental methods to help address problems of sample power and selection of families into care types.

Research Questions.

- Do children in HS experience an improvement in their body mass by kindergarten?
- How do changes in body mass among HS children compare to those among children exposed to other ECE environments (e.g., public preschool, subsidized center care, unsubsidized center care, home care, or parental care)?
- Are high risk groups of children (e.g., overweight and obese children, racial and ethnic minorities,

children with poorly educated mothers) more likely to experience improvements?

Methods.

The overarching methodological approach of the study is to first conduct single survey regression analyses to evaluate the research questions using the ECLS-B and FACES 2006 and then to evaluate the feasibility and statistical methodology for conducting pooled-survey regression analyses with the two surveys. In analyses of changes in child outcomes across ECE environments, we employ propensity score matching to address selection of children into these environments.

Progress Update.

We have completed our evaluation of the feasibility of conducting pooled-survey data analyses using the FACES and ECLS-B. One statistical analysis problem we have encountered is the difficulty of combining survey data from two nationally-representative surveys in which complex sampling schemes were used to collect the data. We had initially intended to employ a strategy for pooling data in which the individual observations from the two data sources are fit using a single model in which potential differences in the parameters for each data sources are tested. However it is impossible with existing statistical software to account for the different stratification and clustering schemes of the two surveys using this approach. This was an unanticipated problem, which had the implications of not only impacting the analyses of change in HS children, but also impacting the analyses of change in HS children relative to subsidized care, unsubsidized care and other forms of care. We were able to devise a method for overcoming this problem and pool the data from the FACES and ECLS-B for the study of HS children alone—but it is a statistical problem beyond the scope of this project to develop a method to combine data from these two data sources for comparison of HS children to

children in other care types. The method we have implemented to now pool the data for the HS children involves treating the analysis as a meta-analysis (rather than a micro-data analysis).

We have successfully pooled the data on the change in BMI z-scores. Our findings are consistent with the findings we had reported earlier for the FACES alone: in both the ECLS-B and FACES obese children experience a (relatively small) statistically significant reduction in BMI z-scores. This indicates that the HS program may be effective for some of the most at risk children in terms of their baseline BMI. We found no evidence that the reductions were stronger for children employed in full-time rather than part-time care (in fact in the ECLS-B a surprisingly larger reduction was observed for part-time care). We also found that there were no social sub-groups by race/ethnicity or gender that consistently showed a pattern in both the ECLS-B and FACES of being either more or less likely to experience reductions in BMI and no such pattern rose to statistical significance in the pooled-survey analyses.

We continue to finalize our analyses of the comparison of BMI z-score change by ECE care types in the ECLS-B. We have conducted multivariate regression analyses that control for differences in the composition of the care types by social, economic and demographic factors, as well as mother's pre-pregnancy BMI and specific factors that families indicated influenced their choice of care types (e.g., proximity to home, cost, size, availability of sick care). We have also conducted propensity score weighted analyses that reweight the data to address the differences between the care types by these compositional factors. We find that in the multivariate adjusted models there is a small but significantly larger increase in BMI z-score for public pre-K, subsidized care, and unsubsidized home care relative to HS (with no statistically significant differences in BMI z-score change between unsubsidized care or parent care and HS). However, with the exception of the contrast between unsubsidized home care and HS, these differences are substantially reduced in magnitude and are no longer statistically significant in the propensity score weighted analyses. The findings thus suggest that there are no differences in children's BMI z-scores across center care when the differences in the characteristics of children and families who select into different types of center care are taken into

consideration. There is a small difference in the change in BMI z-scores between children in unsubsidized home care versus HS, with the former experiencing greater increase in the BMI z-score.

We will continue to evaluate whether there are subpopulations for which changes in BMI z-scores may be larger. To date, we have found no statistically significant sub-group differences (e.g., by baseline BMI, race/ethnicity, nativity, gender, and full-time versus part-time participation).

Implications for policy/practice

Our finding that there was no nationally-generalizable pattern of differences in the changes in child body mass between center-based early care environments may be driven by the considerable variation between and within states in the regulation of health, nutrition and physical activity in non-HS center based child care facilities. In addition, the HS federal program performance standards are intentionally broad to allow for variation in individual programs to meet local communities' needs. Identification of the programs that can most effectively improve child outcomes while meeting these local needs remains a critical policy objective. At the same time, our finding that children in home-based, nonsubsidized, non-parental care experienced the greatest increases in body mass highlight the potential gains in child health of increasing the affordability and availability of high quality center-based care. Finally, achieving reductions in children's body mass may require longer periods of exposure than can be achieved in the ECE environments, and sustained decreases in body mass may require that the ECE programs and policies be recognized as part of a longer continuum of health promotion within the educational system.

For More Information

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