AVA Research Review

Review Title: Examining Adult Health Outcomes of an Early Childhood Intervention Program

Reviewer: Julie M. Tiemeier, PsyD, Cincinnati Children’s Hospital and Medical Center


Article Summary: Brief Overview

Reducing U.S. health care costs has been a focus of recent discussions among policy makers and researchers, who frequently emphasize tertiary prevention as a way to address the problem of rising health care costs. Tertiary preventions focus on reducing the deleterious effects on those who are already sick. However, a growing body of research provides evidence that negative adult health outcomes are more widespread and challenging for those with adverse childhood experiences. There has been a concomitant interest in the need for early prevention and analyses of the impact of early childhood intervention programs on adult health outcomes. This longitudinal study provides positive evidence for a preventative care program, known as the Carolina Abecedarian Project (ABC). The ABC was an interventional study completed from 1972 to 1977 in Chapel Hill, North Carolina with 109 families (111 children). Researchers compared a group of children who received, from birth to age 5, an intensive 8 hours per day, daycare intervention with a non-intervention control group. The intervention curriculum included cognitive and social stimulation, regular pediatric check-ups, and healthy nutrition. All participants were...
randomly assigned to a second stage, less intensive intervention between the ages of six and eight that showed no long term treatment effect. Therefore, the authors focused their analyses on the first stage of the intervention and its relationship to the long-term health outcomes of participants 30 years later. The results provide evidence that an intensive early intervention program is associated with significantly lower risk for cardiovascular and metabolic disease in participants, especially males, from disadvantaged backgrounds.

**Study Aims/Hypotheses:**
This study aims to describe the health outcomes of male and female adults who participated in ABC as children by examining results of a physical exam and laboratory tests completed in the participants’ mid-30s. Researchers focused on cardiovascular and metabolic disease as well as obesity.

**Relevant Findings:**
Physical Health Comparisons: Males who took part in the ABC childhood intervention had significantly lower values of both systolic and diastolic blood pressure and were also less likely to fall into the stage 1 hypertension category. Treated females were less likely to be pre-hypertensive. Treated individuals had higher levels of high-density lipoprotein cholesterol (HDL-C), “good” cholesterol with the magnitude of the difference being larger for males. Although it was not statistically significant, males in the intervention group had a lower prevalence of pre-diabetes indicators and lower rates of severe and abdominal obesity and females had significantly lower rates of abdominal obesity. One in four of the control males had metabolic syndrome, which has been related to greater risk of heart disease, stroke, and diabetes, while none of the males in the intervention group had the conditions associated with metabolic syndrome. Both males and females who took part in the early intervention had a significantly lower risk of coronary heart disease.

Health Care:
At the age of 30, males in the intervention group were significantly more likely to have health insurance and seek care when sick. Similar results were not found for females.

Physical Development:
Males in the intervention group were significantly less likely to be overweight in preschool years relative to control group males who had more weight-for-length change in the first two years of life, a finding that has been related to increased risk of obesity. This trajectory of obesity was noted within the first five years of their lives.

**Authors’ Conclusions:**
The authors concluded that the health differences between the control and intervention groups are likely due to access to health care and appropriate diet in early childhood, improved noncognitive skills, improved cognitive skills, or some combination of these three factors which were all part of the ABC interventions. They also found that up to half of the effect of hypertension and obesity findings were mediated by BMI around the age of one and not significantly affected by having health insurance or improved socioeconomic status at age 30. The authors emphasize that no matter the mechanism, their findings show the importance of early childhood intervention programs.

**Potential Limitations:**
One limitation of this study is the small sample size. While they attempt to consider this limitation in their statistical analyses, the generalizability of this study is limited. Besides the small sample size, the study only analyzes one program within one population. Further research should analyze the intervention protocol on a broad array of
populations. Additional research could also provide insight into what specifically in the intervention is most helpful in reducing adult health problems.

**Reviewer’s Comment:**
Although additional research is necessary to generalize the results, this study provides preliminary evidence for the efficacy of early interventions in children with disadvantaged backgrounds. It is encouraging to document the promising evidence that with intensive early childhood intervention, adult health problems can be mitigated which will ultimately decrease the need for medical interventions as these children grow into adulthood. The monetary implications of this finding are noteworthy. The authors note that their intervention took five years and cost $67,000 (in 2002 dollars). Compared to the high cost of caring for adult health problems, such as hypertension and obesity, the importance of creating and implementing early intervention programs throughout the United States becomes obvious.

Clinically, this study provides additional evidence for the importance of identifying at-risk populations early, providing evidence-based early intervention programs, and establishing a positive emotional and physical health trajectory for these children and their families, thus preventing negative adult health outcomes. It is reassuring that early intervention programs may also encourage male adults to seek health care. While this finding was not found for females, it should be noted that females are more likely to seek healthcare in general.

Finally, this study provided additional evidence of the impact of a high BMI in the first few years of life on the risk of being overweight or obese in adulthood. The implications of this finding are important, particularly in light of the increasing emphasis on childhood obesity and associated health problems. Simply providing pediatric care and parent education on healthy nutrition for infants and children may not be enough to address this problem. The ABC participants from disadvantaged backgrounds had optimal out-of-home care for eight hours per day, five days a week, focused on meeting their health and developmental needs. The challenge is now ours to address.