The Supplemental Nutrition Assistance Program and Academic Performance in SC Children

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INTRODUCTION

Food insecurity is the limited or uncertain ability to obtain quality food. Individuals from food insecure households have reported overall poorer physical and mental health.¹⁻² In children, food insecurity (FI) is negatively associated with school engagement and lower reading and mathematics skills.³ Further, children with better nutritional habits have been shown to perform better in school. The purpose of the supplemental nutrition assistance program (SNAP) is to reduce hunger in families in need. While (SNAP) has shown to reduce household FI, its downstream effect on academic performance has not previously measured.

METHODS

Study Population

This study used a cross-sectional design to evaluate the association of SNAP and educational outcomes. The data came from the 2012 – 2014 South Carolina Behavioral Risk Factor Surveillance System (BRFSS) and the follow-up childhood survey, Children’s Health Assessment Survey (CHAS). This study focuses on children older than 5 years and younger than 18 years old. The low-income children in this study are assumed to be the population of eligible children for SNAP.

Variables

The educational outcomes of interest are:

- A child has repeated a grade (Model 1)
- Academic performance
- Child has above average grades (Model 2)
- SNAP (ref = no)

Analysis

A log-binomial regression model was used to estimate prevalence ratios (PR) of binary outcomes for Model 1 and 2, and a Poisson model was used in Model 3. The adjusted models contain the confounders and the multiplicative interaction between of SNAP participation and income. For the descriptive analysis, means and standard deviations were computed for continuous variables, with t-tests for comparison. Frequency distributions were assessed for categorical variables, using a chi-square test for comparison. Missing observations were imputed using multiple imputations by chained equations for the modeling only using R version 3.3. All other analyses were performed in SAS 9.4.

RESULTS

There were 2,528 total children in from the 2012 – 2014 CHAS surveys included in the analysis, where approximately 25% of the children live in households that receive SNAP benefits. The adjusted model estimates the prevalence ratio (PR) of repeating a grade for those with SNAP benefits to be 1.34 [95% CI (1.02, 1.77)]. In Model 2, the PR of having above average grades was 0.92 [95% CI (0.84, 1.00)]. Model 3, estimated the PR of missing a school day to be 1.25 [95% CI (0.92, 1.76)] for children with SNAP.

Table 1. Characteristics of South Carolina children aged 6+ population, 2012 – 2014 CHAS, n = 2528

<table>
<thead>
<tr>
<th>Variable</th>
<th>Households Receive SNAP</th>
<th>p²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responded a grade, n (%)</td>
<td>106 (21.2) 181 (36.5)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Above average grades, n (%)</td>
<td>328 (74.9) 1604 (95.4)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Number of missed school days*</td>
<td>5.66 (12.74) 4.73 (7.33)</td>
<td>0.123</td>
</tr>
</tbody>
</table>

Table 2. Prevalence ratios/rates and 95% Confidence Intervals from the log-binomial model of SNAP use on child educational outcomes, n = 2528

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child has repeated a grade</td>
<td>2.44 (1.85, 3.21)</td>
<td>0.87 (0.80, 0.94)</td>
<td>1.25 (1.02, 1.55)</td>
</tr>
<tr>
<td>SNAP (ref = no)</td>
<td>2.06 (1.18, 3.59)</td>
<td>0.85 (0.70, 1.03)</td>
<td>1.66 (0.85, 3.24)</td>
</tr>
<tr>
<td>Low-income (ref = no)</td>
<td>1.72 (1.01, 2.93)</td>
<td>0.89 (0.75, 1.06)</td>
<td>1.10 (0.87, 1.39)</td>
</tr>
<tr>
<td>SNAP – Low-income</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

DISCUSSION

Children with SNAP are more likely to repeat a grade. When comparing children from income-eligible households, there was no difference in educational outcomes of those receiving and not receiving SNAP. Household income seems to play a larger role than SNAP participation. Although the effect of SNAP was not significant in the adjusted models, this study adds to the literature as the additional benefits of SNAP have not been consistently established, although the benefits of nutrition on education are well-documented. Future cohort studies are needed to insert the causal effect of SNAP on child academic performance. Limitations. We were unable to include food insecurity, sex, and race, nor SNAP timing. The inclusion of sex and race did not change the PR of SNAP in the preliminary data. Future research may need to include SNAP participation.

REFERENCES


Funding Sources

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