Can school breakfast program participation change rural adolescents’ purchasing behaviors in food stores and restaurants?

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Presenter Disclosures

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No relationships to disclose
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Our Partners

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- University of Minnesota Extension
- Minnesota Department of Education
- Community Blueprint
- Children’s Defense Fund
- MSNA - MN School Nutrition Association
- St. Catherine University

Kathleen Milbrath
School Meals Specialist
The food environment among youth

• Visits to food establishment (retail and restaurants) are common among urban adolescents
  • Corner store visits occur daily or multiple times a week \textsuperscript{a}
  • Students visit fast food outlets on the way to and from school \textsuperscript{b}
  • Associated with poorer youth dietary behaviors \textsuperscript{c}
• Few studies on food establishment use among rural adolescents
  • Rural adolescents face an increased risk of obesity \textsuperscript{d}
  • Food exposures inside and outside the school may influence youth dietary choices
• In Minnesota, rural schools have:
  • More competitive food venues available
  • More sports drinks and salty snacks available \textsuperscript{e}

\textsuperscript{a} Lent et al, \textit{Public Health Nutr}, 2015
\textsuperscript{b} Velazquez et al., \textit{J Acad Nutr Diet}, 2015
\textsuperscript{c} He, \textit{Public Health Nutr}, 2012
\textsuperscript{d} Johnson & Johnson, Child Obes, 2015
\textsuperscript{e} Caspi, \textit{J Acad Nutr Diet}, 2015
The food environment and school meals

• Local food establishments may draw students away from eating meals at school
  • Low-income high-school students 4.2% less likely to participate in school lunch for each fast food restaurant in zip code \(^a\)
  • Open-campus environment associated with increased fast-food consumption at lunchtime \(^b\)

• Gaps in research
  • Longitudinal studies
  • Studies focused on rural areas
  • The role of school breakfast programs (vs. school lunch)

About the School Breakfast Program (SBP)

- Like the National School Lunch Program (NSLP)
  - Free/reduced price meals available
  - Have nutrition standards based on the Dietary Guidelines for Americans
- Unlike the NSLP
  - Participation in the school breakfast program is associated with lower body mass index (BMI)\(^a\)
  - Participation is low \(^b\)
    - In 2012 12.9 million/day vs. 31 million per day for NSLP
- Habitual participation in the school breakfast program could influence food purchasing outside of school by reducing hunger among students

\(^a\) Gleason & Dodd, *J Am Diet Assoc*, 2009

Purpose of the study

• Aims:
  • Describe the frequency of food environment use among rural high-school students
  • To test whether an increase in school breakfast participation over time leads to a decrease in use of stores and restaurants around schools
  • Conducted as part of Project BreakFAST
Primary aim: improve participation in the SBP among high school students
Main Project BreakFAST
Intervention Components

• School breakfast in carts outside the cafeteria (Grab and Go)
• Alternative time to access breakfast (Second Chance breakfast)
• Student led SBP marketing campaign
Study Methods

- Screened all 9th and 10th graders and enrolled a cohort of “breakfast skippers” (eat breakfast <3 times/week)
- At each school, 50-75 eligible students randomly selected to participate; minority students were oversampled
- 904 enrolled
- Online surveys conducted at baseline and follow-up
Measures: School breakfast participation (SBP)

• Schools provided administrative data on school breakfast participation over 2 years
  • 2013-2014 (before the intervention)
  • 2014-2015 (year of the intervention)

• $SBP = \frac{\text{# of days that a student purchased a fully-reimbursable school breakfast}}{\text{# of days that student attended school}} \times 100$

• Change in SBP: change in the proportion of days that each student purchased school breakfast between the two years of data
Measures: Food establishment use

During a normal school week, how many days per week did you get:

- breakfast at a fast food restaurant
- breakfast at another restaurant
- breakfast at a gas station or convenience store
- breakfast at another small food store
- lunch at a fast food restaurant or other restaurant
- lunch at a convenience store, gas station or other small food store
- food or beverages at a fast food restaurant or other restaurant on the way home from school
- food or beverages at a convenience store, gas station, or other small food store on the way home from school

- Response range 0 to 5
- Only students in Wave 2 included (n = 404)
  - 6 / 8 questions were only asked at both time points in Wave 2
- Change in food establishment purchases was dichotomous
  - ‘Decrease’ in the number of days per week vs. ‘No change or increase’ from baseline to follow-up
Analysis

• Descriptive statistics for student characteristics
• Longitudinal analysis used generalized linear mixed models
• Reported odds ratios and 95% CI
• Models included:
  • Random effect of school
  • Fixed effects of SBP, age, gender, free and reduced priced meal eligibility, and race
### Results: Participant characteristics

**Student characteristics at baseline**

<table>
<thead>
<tr>
<th></th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=404</td>
</tr>
<tr>
<td><strong>Grade level</strong></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>51%</td>
</tr>
<tr>
<td>10</td>
<td>49%</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>54%</td>
</tr>
<tr>
<td>M</td>
<td>46%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>67%</td>
</tr>
<tr>
<td>Non-white</td>
<td>33%</td>
</tr>
<tr>
<td><strong>Free/reduced price meal eligibility</strong></td>
<td></td>
</tr>
<tr>
<td>Full priced</td>
<td>65%</td>
</tr>
<tr>
<td>Free/reduced</td>
<td>35%</td>
</tr>
<tr>
<td><strong>Transportation to school by car</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>63%</td>
</tr>
<tr>
<td>No</td>
<td>37%</td>
</tr>
</tbody>
</table>

**Mean (SD)**

| % school breakfast participation (SBP) | 14.0 (20.6) |

No characteristics statistically significantly associated with use of the food environment near the school.
Results: Use of food establishments

| Students reporting use of food establishments at least once in a normal week (baseline), n = 404 |
|---|---|
| For breakfast | 18% |
| For lunch | 27% |
| On the way home from school | 37% |
| Any use of food establishments in the last week | 50% |
## Results: Change in SBP and food establishment use

<table>
<thead>
<tr>
<th>Change in getting...</th>
<th>n</th>
<th>% who decreased</th>
<th>Adjusted odds of a decrease (95% CI)*†</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast at a fast food restaurant</td>
<td>356</td>
<td>8%</td>
<td>0.99 (0.98, 1.01)</td>
<td>0.54</td>
</tr>
<tr>
<td>Breakfast at another restaurant</td>
<td>354</td>
<td>5%</td>
<td>0.99 (0.96, 1.01)</td>
<td>0.19</td>
</tr>
<tr>
<td>Breakfast at a gas station or convenience store</td>
<td>356</td>
<td>9%</td>
<td>0.98 (0.96, 1.00)</td>
<td>0.04</td>
</tr>
<tr>
<td>Breakfast at another small food store</td>
<td>355</td>
<td>5%</td>
<td>0.98 (0.96, 1.01)</td>
<td>0.19</td>
</tr>
</tbody>
</table>

*OR is the odds of a decrease in food establishment visits, given a 1% increase in school breakfast participation

†Models included random effect of school and fixed effects of school breakfast participation, age, gender, free and reduced priced meal eligibility, and race
Limitations

• Alternative explanations for changes in food establishments use are possible
  • E.g., changes in activity spaces, peer influences, and after-school commitments among adolescents
• Food establishment data were self reported and did not capture the specific food establishments that students were exposed to
• Limited generalizability outside of the study area and study population
Conclusions

• Among rural high-school breakfast-skippers, purchasing foods and beverages at stores and restaurants is common.
• School breakfast participation may have a modest impact on student purchases outside of school.
• Additional research is needed to rule out other causes of changing meal patterns among high-school students over time.
Questions?