Create Healthy Snacking Zones Around Rural Schools

Nancy Findholt, PhD, RN\(^1\), Betty Izumi, PhD, MPH, RD\(^2\), Jackilen Shannon, PhD, RD, MPH\(^1\), Thuan Nguyen, PhD\(^1\), Carole Smith, EdM\(^3\), Zunqiu Chen, MS\(^1\)

\(^1\)Oregon Health & Science University \(^2\)Portland State University \(^3\)Oregon State University – Union County Extension Service

**Background & Goal**

- Rural children are at greater risk for obesity than their urban counterparts.
- One contributor to obesity may be unhealthy snacking. Snacking has increased among youth of all ages & the foods children choose as snacks contribute significantly to their total energy intake.
- Children’s snacking habits are influenced by their immediate food environments, including schools & food stores proximal to schools. Thus, interventions are needed to improve these environments, especially in rural areas.
- SNACZ was a 4-year quasi-experimental trial designed to assess the effectiveness of a youth advocacy intervention for improving food environments & food stores.

**Methods**

**Intervention:**
- Youth engagement occurred through participation in 4-H “SNACZ” clubs, established in each intervention school. Students in grades 4-8 were invited to participate in the clubs. The students’ role was to plan & conduct outreach activities to promote healthy snacking among their peers & encourage environmental change within their schools & the food stores. Support was provided by volunteer adult club leaders & project staff. The intervention included 4 phases:
  - Phase 1 focused on team formation & mobilization of the youth advocates. Club members received nutrition lessons & participated in a photovoice assessment to explore their food environments.
  - Phase 2 focused on outreach to peers. Each club implemented 3 outreach projects, such as photo or recipe contests featuring healthy snacks, and tasting tables in schools & at sporting events.
  - Phase 3 focused on outreach to schools. Youth collected data on school food practices & met with school board members to request that healthier practices be adopted.
  - Phase 4 focused on outreach to food stores. Youth worked with store owners to install health snack displays & implemented marketing strategies, such as distributing coupons & offering raffle prizes with purchases.

**Data collection:**
- Teacher surveys
- School principal interviews
- Observation of food marketing in schools
- Checklist of healthy snacks in food stores
- Food store owner interviews
- Student surveys of snack/beverage consumption
- Measurement of student body mass index

**Key Findings**

**Changes in school food environments:**
- After the SNACZ program, intervention teachers had greater overall nutrition knowledge regarding snacks (\(p=0.098\)) and were less likely to use food rewards for students, including sweetened drinks (\(p=0.053\)), than teachers in control schools. A trend toward teachers eating healthier snacks in the classroom was also observed.

**Changes in food stores:**
- Mean availability of healthy snacks/beverages in food stores near intervention schools increased by 21%, while mean availability of these products in stores near control schools decreased by 19%.

**Changes in children’s snacking behaviors:**
- Mean consumption of unhealthy snacks when not at school decreased in both intervention & control sites, but the magnitude of the change was greater in intervention sites. Little change occurred in mean consumption of unhealthy snacks at school.
- Mean consumption of unhealthy beverages when at school and not at school decreased in both intervention & control sites, but the magnitude of the change was greater in intervention sites. (See table, below.)

**Changes in children’s mean consumption of unhealthy snacks & beverages when at school & not at school**

<table>
<thead>
<tr>
<th></th>
<th>Not at school</th>
<th>At school</th>
<th>Intervention</th>
<th>Control</th>
<th>Intervention</th>
<th>Control</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unhealthy snacks</td>
<td>13.09</td>
<td>12.32</td>
<td>12.87</td>
<td>12.20</td>
<td>12.03</td>
<td>12.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Unhealthy beverages</td>
<td>5.31</td>
<td>5.49</td>
<td>5.56</td>
<td>5.57</td>
<td>5.52</td>
<td>5.51</td>
<td>0.04</td>
</tr>
<tr>
<td>Calories</td>
<td>9.60</td>
<td>9.20</td>
<td>9.20</td>
<td>9.20</td>
<td>9.20</td>
<td>9.20</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Changes in obesity prevalence:**
- No improvements were observed in children’s BMI.

**Conclusions**

- The results indicate that youth advocacy can contribute toward creating environments that support healthy snacking within rural schools & food stores, which in turn can improve children’s snacking behaviors. However, additional interventions are needed to reduce childhood obesity prevalence.

**Acknowledgements**

This material is based upon work that was supported by the National Institute of Food & Agriculture, U.S. Department of Agriculture, under award # 2012-68001-19702.