Environmental Modification to Increase Physical Activity During Recess: Preliminary Findings from Ready for Recess

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Background

• Increasing physical activity is a prominent public health objective to combat childhood obesity (Strong et al., 2005)

• Youth are not meeting recommendations for MVPA (Troiano et al., 2008)

• Obese youth spend 16 fewer minutes of time in MVPA per day than normal weight youth (Belcher et al., 2010)

• Girls are less active than boys (Belcher et al., 2010)
Introduction

- Schools are an attractive option for delivering interventions to promote physical activity (Pate et al., 2006)
- Multiple opportunities for physical activity during the school day (NASPE, 2008)
- Recess offers an opportunity for meaningful health enhancing physical activity (Nettlefold et al., 2010)
Recess

- Physical activity levels during recess vary depending on the recess environment (Beighle et al., 2006; Jago & Baranowski, 2004)
- Some evidence suggests students are active as little as 20% of the time during recess (Sallis & Patrick, 1995; Stellino et al., 2010)
- Environmental factors such as availability of equipment, staffing, and zoning may impact PA levels (Huberty et al., in press; Ridgers et al., 2010; Ridgers et al., 2007)
- An efficient recess is important
Purpose

• Little is known about the impact of recess interventions based on moderators such as age, gender, and BMI

• The purpose of this study was to determine the effectiveness of Ready for Recess (R4R) on the MVPA of boys and girls during recess.
## Participants

<table>
<thead>
<tr>
<th></th>
<th>Total N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>118</td>
<td>46%</td>
</tr>
<tr>
<td>Girls</td>
<td>139</td>
<td>54%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
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</tr>
<tr>
<td>Caucasian</td>
<td>101</td>
<td>39%</td>
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<tr>
<td>African American</td>
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<td>29%</td>
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<tr>
<td>Hispanic</td>
<td>75</td>
<td>29%</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>4</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1%</td>
</tr>
<tr>
<td><strong>N=237</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Free &amp; Reduced Lunch Status</strong></td>
<td></td>
<td>66%</td>
</tr>
</tbody>
</table>

Methods

- Data were collected at the end of September, mid-school year, and post intervention in May
- Measurements
  - BMI was evaluated using standardized protocol
  - Accelerometers worn all day for 5 consecutive days during the school hours
- Experimental control pre/post-test design
- Graduate students were at the school in the morning and afternoon each day
- Teachers tracked when students went to recess
**Intervention Arms**

- **Equipment Staff Training (EQ + ST)**
  - Playground Equipment given after baseline data
  - Training Session by a PhD pedagogist
  - Active & Healthy Schools Manual, Playground Activity Cards
  - Activity Zones & Booster Sessions

- **Recess Staff Training Only (ST)**
  - Playground Equipment given after post data

- **Equipment Only (EQ)**
  - Playground Equipment given after baseline data

- **Control**
  - Playground Equipment given after post data
Data Analysis

- Random intercept linear regression models
  - Time (baseline and post-test) nested within children

- DV:
  - Percentage of time during recess spent in MVPA

- IVs:
  - Time (0 = baseline, 1 = post-test)
    *Represents the change in the control group over time*
  - Dummy variables (0/1 three experimental group)
    *Represents the baseline values*
  - Time-by-experimental condition interaction
    *Represents the change over time in each experimental condition in comparison to the control*

- 4 Models Estimated
  - ≥85th and <85th centile
  - Boys and Girls
Changes (baseline to post-test) in percent time during recess spent in moderate-to-vigorous physical activity for boys by weight status (healthy weight and overweight, separately)

Note: Dashed brackets represent contrasts among experimental groups
Abbreviation: EQ = Equipment only, ST = Staff Training only; EQ+ST = Combination

<85th Percentile

- p < .001, 34.2% (95CI 19.3 to 49.1)
- p = .05, -12.5% (95CI -24.9 to 0.02)

≥85th Percentile

- p = .043, 21.6% (95CI 0.8 to 42.5)
- p = .058, 22.7% (95CI 3.2 to 42.2)
Changes (baseline to post-test) in percent time during recess spent in moderate-to-vigorous physical activity for girls by weight status (healthy weight and overweight, separately)

Note: Dashed brackets represent contrasts among experimental groups
Abbreviation: EQ = Equipment only, ST = Staff Training only; EQ+ST = Combination

$p = .052, 12.8\% (95CI -0.1 to 25.4)$

$p = .002, 19.3\% (95CI 7.2 to 31.4)$
Discussion

- EQ + ST can increase PA in healthy weight (HW) boys and overweight/obese (OWOB) girls
- ST can increase MVPA in OWOB boys
- None of the conditions resulted in increased PA for HW girls
  - In fact, HW girls’ PA decreased
- These mixed findings are similar to those across other studies (Cardon et al., 2009; McKenzie et al., 2010; Stellino et al., 2010)
Discussion

- Intervention effect relative to weight status should be examined
  - OWOB boys need support from staff but may enjoy activities that require minimal equipment
- The decrease in MVPA for HW girls is a surprising finding
  - Were previous activities not included as a part of the intervention?
  - Zone activities such as long rope jumping and hula hooping may not be conducive for MVPA
- EQ+ST was effective for OWOB girls
Limitations

- Only four schools were used, thus we cannot disentangle the treatment effect from the school.

- Child level effects were evaluated while random assignment and treatment were at the school level.
Conclusion

- R4R represents a possible means to increase MVPA, particularly for OWOB girls and boys
- More research using a greater number of schools is warranted
- Currently a large scale ALR funded trial is being implemented to provide further insight into the effectiveness and utility of R4R
Thank You!