Contribution of Neighborhood SES and Physical Activity Resource Quality to Changes in Physical Activity in Minority Women

Dr. Rebecca E. Lee, PhD
Scherezade K. Mama, MPH
Heather J. Adamus-Leach, MS
Erica B. Soltero, BS

Texas Obesity Research Center
Health & Human Performance
University of Houston
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Background

- Residence in lower socioeconomic status (SES) neighborhoods has been associated with lower rates of physical activity.
  (Boone-Heinonen, Diez Roux, Kiefe et al 2011; Yen, Kaplan 1998)

- Access to high quality physical activity resources may buffer some of the detrimental effects of low SES neighborhoods.
Research Question

What is the relationship of neighborhood SES and access to quality physical activity resources to physical activity among African American and Hispanic or Latino women over time?
Health Is Power

- Houston and Austin, Texas
- 5-year longitudinal study
- Increase physical activity (walking) or vegetable and fruit consumption
- 6 month social cohesion intervention
Research Design

Baseline Assessment (Time 1) → 6 Month Intervention → Post Assessment (Time 2)
Participants

- African American
- Hispanic
- Women
- Age 44.3 ± 11.0
- BMI 34.0 ± 9.7
- IPAQ long form
- Accelerometer
## Participant Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Total (N=309)</th>
<th>African American (N=202)</th>
<th>Hispanic or Latina (N=107)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td></td>
<td>45.8 (9.5)</td>
<td>45.4 (9.2)</td>
<td>46.4 (10.1)</td>
</tr>
<tr>
<td><strong>BMI (kg/m2)</strong></td>
<td>34.2 (8.1)</td>
<td>34.5 (8.0)</td>
<td>33.5 (8.3)</td>
</tr>
<tr>
<td><strong>Accelerometer PA (min/day)</strong></td>
<td>19.6 (19.3)</td>
<td>24.3 (21.6)</td>
<td>10.9 (9.4)*</td>
</tr>
<tr>
<td><strong>IPAQ Walking (MET-min/day)</strong></td>
<td>716.9 (1692.9)</td>
<td>867.7 (2029.0)</td>
<td>432.2 (628.8)*</td>
</tr>
</tbody>
</table>
Defining Neighborhoods

Definir Vecindarios

- Radial buffer 800 mtrs
  *búfer radial 800 mtrs*

- All physical activity resources
  *Todos recursos para actividad física*

McMillan TM, Cubbin C, Parmenter B, Medina AV, Lee RE. Neighborhood sampling: how many streets must an auditor walk? 2010, 7:20 http://www.ijbnpa.org/content/7/1/20
Physical Activity Resource Assessment (©2010; PARA)

Measures physical activity resource type, size, features, amenities, and incivilities. *Mide actividad física de tipo recurso, el tamaño, las características, los servicios, y las descortesías.*
<table>
<thead>
<tr>
<th>Feature</th>
<th>Rating</th>
<th>Amenity</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>13) Baseball field</td>
<td>0 1 2 3</td>
<td>26) Access Points</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>14) Basketball courts</td>
<td>0 1 2 3</td>
<td>27) Bathrooms</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>15) Soccer field</td>
<td>0 1 2 3</td>
<td>28) Benches</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>16) Bike Rack</td>
<td>0 1 2 3</td>
<td>29) Drinking fountain</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>17) Exercise Stations</td>
<td>0 1 2 3</td>
<td>30) Fountains</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>18) Play equipment</td>
<td>0 1 2 3</td>
<td>31) Landscaping efforts</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>19) Pool &gt; 3 ft deep</td>
<td>0 1 2 3</td>
<td>32) Lighting</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>20) Sandbox</td>
<td>0 1 2 3</td>
<td>33) Picnic tables shaded</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>21) Sidewalk</td>
<td>0 1 2 3</td>
<td>34) Picnic tables no-shade</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>22) Tennis courts</td>
<td>0 1 2 3</td>
<td>35) Shelters</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>23) Trails – running/biking</td>
<td>0 1 2 3</td>
<td>36) Shower/Locker room</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>24) VB courts</td>
<td>0 1 2 3</td>
<td>37) Trash containers</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>25) Wading Pool &lt; 3 ft.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incivilities</td>
<td>Rating</td>
<td>Incivilities</td>
<td>Rating</td>
</tr>
<tr>
<td>38) Auditory annoyance</td>
<td>0 1 2 3</td>
<td>44) Graffiti/tagging</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>39) Broken glass</td>
<td>0 1 2 3</td>
<td>45) Litter</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>40) Dog refuse</td>
<td>0 1 2 3</td>
<td>46) No grass</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>41) Dogs Unattended</td>
<td>0 1 2 3</td>
<td>47) Overgrown grass</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>42) Evidence of alcohol use</td>
<td>0 1 2 3</td>
<td>48) Sex paraphernalia</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>43) Evidence of substance use</td>
<td>0 1 2 3</td>
<td>49) Vandalism</td>
<td>0 1 2 3</td>
</tr>
</tbody>
</table>

Comments:

Http://www.hhp.uh.edu/undo
Quality Physical Activity Resources

- Developed to rank total neighborhood quality
- Can also use at the individual level
- Access to quality PARs was determined by a composite index, aggregated for each neighborhood:

  Individual QPAR = Features + Amenities - Incivilities
  Neighborhood QPAR = Sum of all individual QPARs
Analyses

- Median household income
- Aggregated US census tract information
- Low vs. high SES neighborhoods
- Neighborhood income and QPAR scores were dichotomized using a median split.
- Repeated measures ANOVA adjusted for individual income, age and ethnicity.
<table>
<thead>
<tr>
<th></th>
<th>Median</th>
<th>Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Household Income</td>
<td>$37,739</td>
<td>$40,587 (17,189)</td>
<td>$13,421-119,260</td>
</tr>
<tr>
<td>Physical Activity Resources</td>
<td>n/a</td>
<td>3.79 (2.6)</td>
<td>0-17</td>
</tr>
<tr>
<td>QPAR Score</td>
<td>15</td>
<td>6.5 (9.7)</td>
<td>-3 - 66</td>
</tr>
</tbody>
</table>
Self-Reported Physical Activity (IPAQ)

MET-minutes per week

Type of Physical Activity

- Total
- Work-related
- Transportation
- Home/Gardening
- Leisure
- Walking
- Moderate
- Vigorous

Pre Intervention (T1)
Post Intervention (T2)

All ps<.001, except Home/Gardening
Objectively Measured Physical Activity (Accelerometer)

Minutes per day

Pre Intervention (T1)  Post Intervention (T2)
Interaction Between QPAR and Neighborhood SES

Accelerometer Measured PA; Interaction: \((F(1,57)=8.108, p=0.006)\)
Conclusions

- Access to more, higher quality resources may positively influence changes in objectively measured physical activity regardless of neighborhood SES.
- Simply having access to a resource may not be sufficient to impact physical activity activity.
- Improving the quality of existing resources may be a good strategy to increase physical activity.
Gracias y Pocito Más...

- Rebecca Lee
  releephd@yahoo.com
- Visit the Texas Obesity Research Center
  www.hhp.uh.edu/obesity

Scherezade Mama, Heather Adamus, Erica Soltero