DIFFERENCES IN HOME FOOD AND ACTIVITY ENVIRONMENTS BETWEEN OBESE AND HEALTHY WEIGHT FAMILIES OF PRESCHOOL CHILDREN

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Presented by

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Differences in Home Food and Activity Environments between Obese and Healthy Weight Families of Preschool Children

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Objectives

• Describe preschool obesity prevalence and the assessment of home environments
• Understand measurement development using direct observations
• Review home food and activity environment differences based on weight status
• Identify future areas of research on home environment research
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>All</td>
<td>12.1%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>9.2%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>18.9%</td>
<td>11.3%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>16.2%</td>
<td>16.7%</td>
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</table>
Obesity Prevention and Treatment

• Interventions are complex and often include:
  • Diet and Activity
    • Monitoring
    • Increase fruit and vegetable intake
    • Reduce “red” foods
    • Increase outside activity time / limit screen time
    • Set realistic behavior goals
  • What about modification of the home food and activity environment?
Theoretical Model

- Home
  - Work sites
  - School, after school
  - Child care
  - Neighborhoods and communities
  - Restaurants and fast food outlets
  - Supermarkets
  - Convenience and corner stores

- Access
  - Availability
  - Barriers
  - Opportunities

- Practices
  - Legislative, regulatory, or policy actions

- Societal and cultural norms and values
- Food and beverage industry
- Food marketing and media
- Food and agriculture policies
- Economic systems
- Food production and distribution systems
- Government and political structures and policies
- Food assistance programs
- Health care systems
- Transportation use and

- Cognitions (e.g., attitudes, preferences, knowledge, values)
- Skills and behaviors
- Lifestyle
- Biological (e.g., genes, gender, age)
- Demographics (e.g., income, race/ethnicity)

- Outcome expectations
- Motivations
- Self-efficacy
- Behavioral capability

- Role modeling
- Social support
- Social norms

- Family
- Friends
- Peers

Annu. Rev. Public Health. 29:253–72
Home environments:

• Related to:
  • What foods children consume
  • Physical activity
  • Sedentary behavior

• Calories from various locations
  • Home (71% calories per day)
  • Child care (50-75% calories per day)
Measurement Methods and Issues

• Self-report most commonly used method
• Direct observation
  • Psychometric advantages
  • Feasibility and acceptability concerns
• Few studies included children with weight diversity
Study Purpose

• Objectively examine the home food and activity environment of families with preschool aged children

• Include families categorically different in weight status (obese vs non-obese)
Hypotheses

• Compared to healthy weight families, obese families were more likely to have:
  • Greater availability/accessibility of unhealthy foods and drinks
  • Fewer fresh fruits and vegetables
  • More sedentary devices
  • Fewer physical activity devices
Methods

• Instrument Development
  • Self-report measures
  • Expanded definitions/categories
    • Inclusion of fresh fruits and vegetables
    • Devices for young children
      • Seated scooters
Instrument: Content areas

• Healthy and Unhealthy Foods and Drinks
  • 23 items (Table 1)

• Fresh Fruits and Vegetables
  • 18 fruits – 14 vegetables (Table 2)

• Physical Activity Devices
  • 15 devices (Table 3)

• Electronic Devices
  • TV, computers, video game players
Home Assessment

• Availability
  • Physically in the home

• Accessibility
  • Within reach of the target child
  • 50\textsuperscript{th} percentile for ht, plus 18 inches

• Readiness to be eaten
  • No preparation or other person needed
  • Unopened versus opened, raw vs cooked
Preliminary training/development

- Pilot testing
  - Independent homes
- Item revisions
  - Inclusion of specific nutritional content (sugar)
- Protocol development
  - Written definitions and procedures
Participants

• Recruitment methods
  • Employee email lists, treatment seeking, community lists

• Inclusion criteria
  • Child
    • 15th-85th BMI percentile or above 95th BMI percentile
    • No obese parents or at least 1 obese parent

• Exclusion criteria
  • Medical conditions
  • Weight affecting medication
  • Physical activity limitations
  • Non-English speaking
  • Greater than 50 miles away from hospital
Measures

- Anthropometrics (portable scale, stadiometer)
- Demographics
- HHE
  - Parent completed
  - Independent observer
  - 2\textsuperscript{nd} independent observer (n=18)
Procedures

•Consented
•Demographics
•HHE (independently completed)
•$20 Gift card
Statistical Analyses

- Inter-rater reliability

<table>
<thead>
<tr>
<th>Item 1</th>
<th>Rater 1</th>
<th>Rater 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Yes (1)</td>
<td>Yes (1)</td>
</tr>
<tr>
<td>002</td>
<td>No (0)</td>
<td>Yes (1)</td>
</tr>
<tr>
<td>003</td>
<td>Yes (1)</td>
<td>No (0)</td>
</tr>
</tbody>
</table>

- Landis and Koch guidelines for interpretation

- I.C.C. for more than dichotomous outcome
Statistical Analysis

• Discriminative validity
  • MANOVA-food items
  • Univariate follow up tests
  • t-tests for PA items
  • chi-square, group percentage differences
Results

- Participant Characteristics
  - Obese preschool children (n=35)
    - $M$ BMI percentile = 98.8
    - 4 years old
    - 57% male
    - Maternal $M$ BMI = 37.4
  - Healthy Weight children (n=47)
    - $M$ BMI percentile = 53.7
    - 4 years old
    - 47% male
    - Maternal $M$ BMI = 37.4
Results

• **Participant Characteristics**
  - 86-96% Caucasian
  - 90% reported multiple children in home
  - 84% were mothers
  - 89% married
  - 47% full time, 36% part time, 17% less than part time
  - 61% between $50K-$124K per year annual income
Results

• Inter-rater reliability
  • Healthy and Unhealthy Foods and Drinks
    • 12 items removed
  • Fresh Fruits and Vegetables
  • Physical Activity Devices
    • 4 items removed
  • Electronic Devices
Results

• Discriminative Statistics
  • Healthy and Unhealthy Foods and Drinks (NS)
  • Fresh Fruits and Vegetables
  • Physical Activity Devices
  • Electronic Devices
## Results

### Table 4. Mean (SD) Number of Foods in Each Category Found in Healthy Weight and Obese Weight Home Environments

<table>
<thead>
<tr>
<th>Category</th>
<th>Healthy Weight (n = 47)</th>
<th>Obese (n = 35)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy and unhealthy foods and drinks (availability)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unhealthy snacks/foods</td>
<td>7.3 (0.76)</td>
<td>7.2 (0.90)</td>
</tr>
<tr>
<td>Unhealthy drinks</td>
<td>1.2 (0.75)</td>
<td>1.1 (0.69)</td>
</tr>
<tr>
<td>Fruits and vegetables and healthy foods</td>
<td>6.7 (1.24)</td>
<td>6.2 (1.85)</td>
</tr>
<tr>
<td>Fresh fruits and vegetables (availability)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh fruits</td>
<td>3.2 (1.79)</td>
<td>3.0 (1.99)</td>
</tr>
<tr>
<td>Fresh vegetables</td>
<td><strong>3.8 (1.85)</strong></td>
<td><strong>2.5 (2.25)</strong>*</td>
</tr>
<tr>
<td>Fresh fruits and vegetables (accessibility)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh fruits</td>
<td>3.3 (1.70)</td>
<td>2.9 (2.19)</td>
</tr>
<tr>
<td>Fresh vegetables</td>
<td><strong>3.6 (1.66)</strong></td>
<td><strong>2.6 (1.97)</strong>*</td>
</tr>
<tr>
<td>Fresh fruits and vegetables (readiness to eaten)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh fruits</td>
<td>2.2 (1.09)</td>
<td>1.8 (1.33)</td>
</tr>
<tr>
<td>Fresh vegetables</td>
<td>2.3 (1.34)</td>
<td>1.8 (0.88)</td>
</tr>
</tbody>
</table>

*P = .005, based on follow-up tests using univariate ANOVA.
## Results

**Table 5.** Devices per Home and Percentage of Homes with Sedentary and Physical Activity Devices Found in Healthy Weight and Obese Weight Home Environments

<table>
<thead>
<tr>
<th></th>
<th>Healthy Weight (n = 47)</th>
<th>Obese (n = 35)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electronic devices in home</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Televisions (mean [SD])</td>
<td>3.6 (1.45)</td>
<td>3.7 (1.26)</td>
</tr>
<tr>
<td>Computers (mean [SD])</td>
<td>1.7 (0.85)</td>
<td>1.7 (0.88)</td>
</tr>
<tr>
<td>Videogame players (mean [SD])</td>
<td>2.1 (1.67)</td>
<td>1.9 (1.50)</td>
</tr>
<tr>
<td>Television in child’s bedroom (%)</td>
<td>12.8</td>
<td>37.1***</td>
</tr>
<tr>
<td><strong>Average number of selected PA devices in home (mean [SD])</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.5 (2.0)</td>
<td>6.7 (1.8)*</td>
</tr>
</tbody>
</table>
Discussion

• Primary differences
  • Availability of fresh vegetables
  • Accessibility of fresh vegetables
    • Servings, preferences, consumption
  • Income may contribute, but not in our study

• Similarities
  • Unhealthy foods and drinks
    • May be managed differentially by parenting practices
Discussion

• Physical Activity devices
  • Total differences driven largely by 1 item
    • water and snow equipment

• Sedentary devices
  • Child’s bedroom most important area in home
    • Availability of TV
Limitations

• Single assessment
• Quantity of food not assessed
• Small sample size
• Low diversity in SES, geography
• Additional item refinement
  • Cultural considerations
• Diet and activity behaviors not assessed
Implications

- Changing the home food and activity environment may have an impact on weight prevention or weight loss interventions.

- This tool has been sensitive to changes before and after obesity treatments for preschool aged children.
New Directions

• More diverse samples
• Improved item development
• Included within treatment and prevention studies
• Validated to be reliable self-report
Acknowledgements

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- K23 DK 087826 (Richard Boles)

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