The Effects of a Structured Pedometer Exercise Program on Blood Pressure and BMI of Children Ages 9-12 Years

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Introduction

- Sedentary lifestyle becoming the natural lifestyle of people in the United States
- About 1 in 3 U.S. adults is obese (BMI>40)
- 17% of children and teens are affected by obesity
- CDC defines child obesity by using “BMI-for-Age”
- A percentile ≥ 95th is considered obese

Current Pedometer Research

Dr. Dena Bravata
- Meta-analysis of current pedometer studies
- Mostly women (85%)
- Mean age of 49 years
- Research with Children
  - Dr. Catrine Tudor-Locke
  - Recommendation for children ages 6-12
    - Females: 11,000 steps/day
    - Males: 13,000 steps/day
  - Found that from age 6-19
    - Females take on average 3,272 steps less than recommended
    - Males take on average 3,864 steps less than recommended

Limited Research conducted on developing a walking program for children

Purpose of Study

- To determine the effect of a structured pedometer walking program on blood pressure and BMI of children aged 9 to 12 years
- Experimental hypothesis: The program will help motivate children to become more active and improve their blood pressure and BMI

Methods

- Case study of 5 children (began with 10, but 5 subjects dropped-out)
  - 3 males, 2 females
  - Mean age: 10.6 ± 1.34 years
  - BMI range: 15.4 to 27.9 kg/m²
- Pedometer used: Yamax Digi Walker SW-200
- Dr. Patrick Schneider research for accuracy and validation
- Pre and Post Testing
  - Height and weight measured without shoes and in athletic wear
  - Blood pressure taken twice on right arm for both pre and post testing
- Data statistically analyzed using SPSS v18
  - Both group and individual results examined

Procedure

- Length: 3-4 weeks
- Each child given a pedometer and log book to record daily steps
  - Parents asked to initial after each data entry
- Preliminary step counting performed to define baseline for average number of daily steps
- Daily step goal was given for each child

Case Results

- Subject 2: 12 year old female
  - BMI category: healthy weight
  - Blood pressure: normal
  - Weight: 116.8 lbs
  - BMI: 21.0 lbs
  - Blood Pressure: normal

Group Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t (&gt;3.18)</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Pre (lbs)</td>
<td>104.96</td>
<td>32.73</td>
<td>-0.947</td>
<td>0.35</td>
</tr>
<tr>
<td>Weight Post (lbs)</td>
<td>106.08</td>
<td>32.42</td>
<td>-1.62</td>
<td>0.18</td>
</tr>
<tr>
<td>Height Pre (inches)</td>
<td>58.4</td>
<td>3.13</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Height Post (inches)</td>
<td>58.4</td>
<td>3.13</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BP Systolic Pre (mm/Hg)</td>
<td>91.02</td>
<td>4.83</td>
<td>-0.004</td>
<td>0.99</td>
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<tr>
<td>BP Systolic Post (mm/Hg)</td>
<td>93.2</td>
<td>5.2</td>
<td>-2.89</td>
<td>0.009</td>
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<tr>
<td>BP Diastolic Pre (mm/Hg)</td>
<td>59.5</td>
<td>4.36</td>
<td>-0.69</td>
<td>0.49</td>
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<tr>
<td>BP Diastolic Post (mm/Hg)</td>
<td>61.6</td>
<td>3.68</td>
<td>-1.02</td>
<td>0.33</td>
</tr>
</tbody>
</table>

Daily steps improved by 2,628.69 steps

Discussion

- No statistically significant changes
  - Small number of subjects
  - Short period of time
- All subjects improved number of daily steps
  - Mean improvement of 2628.7 steps/day
- 3 of the 5 subjects saw weight gain
  - Growth, poor diet, lack of further exercise, etc.
- Further research needs to be conducted in order to make more definite conclusions

Practical Applications

- May be beneficial to conduct during the school year as opposed to summer
  - Eating schedule
  - Possibly less drop-outs due to vacations
- Bigger pool of subjects
- Long-term results
  - Will improvements made continue or more improvements?
- Methods of body composition instead of BMI