The Influence of Contingency Management on Physical Activity Levels among HIV Positive Substance Users

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Introduction

- Benefits of physical activity and exercise for people with HIV include:

Introduction

- The majority of people with HIV are not physically active enough to achieve the health benefits of exercise

Contingency Management (CM) is one possible behavioral change strategy to improve physical activity levels among people with HIV. CM provides incentives to reinforce abstinence from undesired behaviors or adherence to a treatment plan\(^1\). Limited evidence suggests CM may improve physical activity levels in the general population\(^2\).

Purpose

- Investigate the effects of CM on physical activity levels among people with HIV and substance use disorders
Hypotheses

- Those receiving CM for exercise will increase levels of physical activity versus a comparison group.
- Those receiving CM for exercise will show greater improvement in health fitness measurements versus a comparison group.
Subjects

- Members of Connections, an HIV drop-in center in Hartford, CT
- 18-55 years
- HIV positive
- DSM-IV diagnosis of opioid, cocaine, methamphetamine, alcohol, or marijuana abuse or dependence within the last year
- Written permission from a physician
Project Timeline

Baseline (n=11)

Randomization

CM for Exercise (n=4)  
2 Month

Comparison (n=7)  
2 Month
Assessment Measures
Treatment Groups
## Exercise Sessions

<table>
<thead>
<tr>
<th>Frequency</th>
<th>≥ 3 days per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensity</td>
<td>Light to vigorous</td>
</tr>
<tr>
<td>Time</td>
<td>≥ 30 minutes per session</td>
</tr>
<tr>
<td>Type</td>
<td>Combination of resistance and aerobic training</td>
</tr>
</tbody>
</table>
## Sample Physical Activity Contract

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time</th>
<th>Potential Problems</th>
<th>Verification</th>
<th>Done</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 minute Exercise Session at the Center</td>
<td>Tuesday @ 11:00</td>
<td>Don’t feel like it</td>
<td>Attendance Sheet</td>
<td></td>
</tr>
<tr>
<td>30 minute Exercise Session at Gym</td>
<td>Thursday @ 11:00</td>
<td>Don’t feel like it</td>
<td>Attendance Sheet</td>
<td></td>
</tr>
<tr>
<td>Pedometer: 7,500 steps</td>
<td>Saturday</td>
<td>Weather</td>
<td>Pedometer</td>
<td></td>
</tr>
<tr>
<td>Pedometer: 7,500 steps</td>
<td>Sunday or Monday</td>
<td>Weather</td>
<td>Pedometer</td>
<td></td>
</tr>
</tbody>
</table>
Reinforcement
Statistical Analyses

- Means $\pm$ SEM were generated on all study variables
- Repeated measures ANCOVA tested if:
  - Habitual physical activity levels differed over time between experimental groups
  - Health related fitness measures differed over time between experimental groups
## Baseline Subject Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (± SEM) Value</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (yr)</strong></td>
<td></td>
<td>46.0±2.4</td>
<td>42.8±4.7</td>
</tr>
<tr>
<td><strong>Body Mass Index (kg/m²)</strong></td>
<td></td>
<td>26.2±1.8</td>
<td>29.7±5.7</td>
</tr>
<tr>
<td><strong>Waist Circumference (cm)</strong></td>
<td></td>
<td>92.6±6.5</td>
<td>90.8±11.6</td>
</tr>
<tr>
<td><strong>Blood Pressure (mmHg)</strong></td>
<td></td>
<td>126.7±9.0/87.7±8.1</td>
<td>122.2±7.8/80.4±7.0</td>
</tr>
<tr>
<td><strong>Grip Strength (kg)</strong></td>
<td></td>
<td>39.5±6.4</td>
<td>36.1±4.1</td>
</tr>
<tr>
<td><strong>Floor Transfer Time (s)</strong></td>
<td></td>
<td>3.7±1.2</td>
<td>4.3±.9</td>
</tr>
<tr>
<td><strong>Sit &amp; Reach (cm)</strong></td>
<td></td>
<td>29.1±5.9</td>
<td>32.0±4.8</td>
</tr>
</tbody>
</table>
Mean (±SD) Change in Weekly Walking Distance from Baseline to 2 m

-4  -2  0  2  4  6  8  10  12  14  16  18

Baseline 2 m

Weekly Walking Distance (mi/wk)

CM for Exercise

Comparison

P=0.003, versus comparison group

11.5

-1.0
Mean (±SD) Change in Weekly Caloric Expenditure due to Physical Activity from Baseline to 2 m

CM for Exercise: 1512.1 kcal/wk
Comparison: -291.9 kcal/wk

P=0.002, versus comparison group
Mean Change (±SEM) in Time Spent in Vigorous, Moderate, and Light Intensity Physical Activity (n=11)

<table>
<thead>
<tr>
<th>Variable</th>
<th>CM for Exercise</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigorous Activity</td>
<td>3.0 ± 2.3</td>
<td>0.7 ± 2.6</td>
</tr>
<tr>
<td>(hr/wk)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate Activity</td>
<td>7.6 ± 6.2</td>
<td>-1.4 ± 8.2</td>
</tr>
<tr>
<td>(hr/wk)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light Activity</td>
<td>9.6 ± 13.8</td>
<td>7.3 ± 14.0</td>
</tr>
<tr>
<td>(hr/wk)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion

- It appears CM was effective in increasing weekly walking distance and weekly caloric expenditure.
- Time spent in vigorous, moderate, and light intensity physical activity tended to increase for those in the CM group.
- Health fitness measures were not different over 2 months.
Limitations

- Self-report measure
- Preliminary findings
- Small sample size (n=11)
- 2 month follow-up period
Questions ?