Key Factors Influencing Adherence to High-Intensity Functional Training

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Exercise Adherence

• Structured exercise programs (Marcus et al., 2006)
  – Average of 45% drop out in first 6 months
  – Social support
  – Enjoyment

• Unclear if high-intensity functional training (HIFT) has similar rates and what factors influence adherence
High–Intensity Functional Training (HIFT)

- Group–exercise program
- Temporally combines aerobic, body weight, and weight lifting exercises in constantly–varied time domains and patterns
- Focus on functional movements
- Shorter–duration than moderate exercise

(Heinrich et al., 2014)
Behavioral HIFT Research

- Overweight and obese adults sustained exercise enjoyment and increased intentions to continue (Heinrich et al., 2014).

- Teens (15–16y) reported high satisfaction for perceived benefits and enjoyment possibly due to focus on mastering skills (Eather et al., 2015).

- HIFT improved emotional functioning among cancer survivors (Heinrich et al., 2015).
HIFT Programs

- Various HIFT programs exist and have been growing in popularity

- This study focused on CrossFit®
Purpose

• To examine differences in social-behavioral characteristics between HIFT dropouts versus adherers
Design

• Program evaluation study at university CrossFit® gym (Feb. 2013–April 2014)
  – Continuous enrollment
  – Assessments at baseline, 2–, 6–, & 12–months
Methods

Participants (N=89)
- Students, staff, faculty, community members
- 88.8% white
- 12.4% Hispanic/Latino
- 97.8% had some college education
- CrossFit experience from none to >2 years
- Weekly CrossFit participation: 3.7±1.2 days

Measures
- Baseline Questionnaire
  - General health (BRFSS)
  - Physical Activity Enjoyment Scale (Kenderzierski & DeCarlo, 1991)
  - Fitness Attitudes Scale (Kerner & Grossman, 2001)
  - Exercise self-confidence (Bandura, 2006)
  - Exercise intentions (Kerner & Grossman, 2001)
- Adherence
Analysis

- SPSS 21
- Independent samples t-tests
  - For inclusion in regression $p < .01$
- Binary logistic regression
  - Controlled for sex, age, and frequency of weekly class attendance
  - Adherence as dependent variable
  - Social-behavior predictor variables
  - Statistical significance set at $p < .05$
Results – Adherence

- 60 participants (67.4%) adhered to CrossFit by end of study
- 9 dropouts provided a reason(s)
  - 4 = cost and/or lack of time
  - 2 = graduated and other
  - 1 = training for other sports
## Results – independent samples t–tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>Dropouts (n=16-17)</th>
<th>Adherers (n=53-54)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days in past 30 mental health was not good</td>
<td>6.7</td>
<td>2.5</td>
<td>2.7</td>
<td>.007</td>
</tr>
<tr>
<td>Day in past 30 you felt very healthy/full of energy</td>
<td>14.8</td>
<td>23.8</td>
<td>4.6</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Motivation to exercise –1 (very low) to 10 (very high)</td>
<td>7.2</td>
<td>8.7</td>
<td>3.3</td>
<td>.004</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exercise Self-Confidence Scale – 11 items rated from 1 (cannot do this at all) to 10 (certain I can do this successfully)</th>
<th>Dropouts (n=16-17)</th>
<th>Adherers (n=53-54)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do physical exercises that require resistance</td>
<td>6.8</td>
<td>8.4</td>
<td>3.3</td>
<td>.002</td>
</tr>
<tr>
<td>Do physical exercises or compete in a sport that requires agility</td>
<td>6.1</td>
<td>7.7</td>
<td>2.9</td>
<td>.005</td>
</tr>
<tr>
<td>Do physical exercises or compete in a sport that requires strength</td>
<td>5.9</td>
<td>8.0</td>
<td>4.0</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

(Adapted from Bandura, 2006)
Results – independent samples t–tests

<table>
<thead>
<tr>
<th>Fitness Attitudes Scale Items – 19 items rated from -3 (strongly disagree) to 0 (neutral) to +3 (strongly agree)</th>
<th>Dropouts (n=16-17)</th>
<th>Adherers (n=53-54)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have more control of my life as a results of my CrossFit activities</td>
<td>0.4</td>
<td>1.6</td>
<td>3.1</td>
<td>.003</td>
</tr>
<tr>
<td>CrossFit activities help my body to relax</td>
<td>0.3</td>
<td>1.7</td>
<td>3.4</td>
<td>.001</td>
</tr>
<tr>
<td>Exercise activities let me mentally unwind</td>
<td>1.9</td>
<td>2.6</td>
<td>3.1</td>
<td>.003</td>
</tr>
<tr>
<td>I give CrossFit activities high priority among other activities</td>
<td>1.1</td>
<td>2.2</td>
<td>3.9</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>CrossFit activities allow me to draw more pleasure from other leisure activities</td>
<td>0.9</td>
<td>1.9</td>
<td>3.1</td>
<td>.003</td>
</tr>
</tbody>
</table>

(Kerner & Grossman, 2001)
Activities of Daily Living – 7 items rated from 1 (unable to do) to 3 (sometimes is difficulty) to 5 (not at all difficult)

<table>
<thead>
<tr>
<th>How difficult is it for you to engage in strenuous physical activity for 30min, such as running, playing basketball, biking, skiing, or swimming laps?</th>
<th>Dropouts (n=16-17)</th>
<th>Adherers (n=53-54)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>4.5</td>
<td>5.7</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>
### Logistic Regression Predicting HIFT Adherence

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR</th>
<th>90% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>1.33</td>
<td>0.39-39.35</td>
<td>.249</td>
</tr>
<tr>
<td>Age</td>
<td>5.68</td>
<td>1.03-1.32</td>
<td>.017</td>
</tr>
<tr>
<td>Weekly class frequency</td>
<td>5.11</td>
<td>1.18-10.47</td>
<td>.024</td>
</tr>
<tr>
<td>Days in past 30 you felt very healthy/full of energy</td>
<td>1.12</td>
<td>0.94-1.23</td>
<td>.291</td>
</tr>
<tr>
<td>Confidence to do physical exercises or compete in a sport that requires</td>
<td>4.88</td>
<td>1.09-4.12</td>
<td>.027</td>
</tr>
<tr>
<td>Ability to engage in strenuous physical activity for 30 minutes</td>
<td>3.89</td>
<td>1.01-11.21</td>
<td>.049</td>
</tr>
</tbody>
</table>

$X^2 (6, N=69) = 45.5, p<.001$; Predicted 91.3% (96.2% adherers, 75.0% dropouts)
Conclusions

• HIFT adherence was higher than average (Marcus et al., 2006).

• Those with greater self-efficacy for exercise/sport requiring strength and less difficulty with strenuous exercise were more likely to adhere to CrossFit.
Implications

• Dropouts provided common barriers to exercise (cost, time; Marcus et al. 2006)
  – Access to other CrossFit gyms increased adherence

• Future research should assess preferences for intense exercise requiring strength
  – Current research with Army personnel and HIFT (R01DK099516) includes the PRETIE–Q (Ekkekakis et al., 2005).
References

- Heinrich KM, Patel PM, O’Neal JL, Heinrich BS. High-intensity compared to moderate-intensity training for exercise initiation, enjoyment, adherence, and intentions: an intervention study. *BMC Public Health* 2014;14:789. [www.biomedcentral.com/1471-2458/14/789](http://www.biomedcentral.com/1471-2458/14/789)