Exercise: Is it the chill pill for stress?

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Introduction

• Mental stress \(\rightarrow\) increases in blood pressure & negative mood
• Large stress responses \(\rightarrow\) cardiovascular disease and psychological disorders
• Exercise is believed to reduce the cardiovascular and psychological responses to stress
• However, little research has looked at both the cardiovascular and psychological responses to stress following a short bout of exercise

Research Question

Can a short bout of exercise influence the cardiovascular and psychological responses to mental stress?

Methods

Participants
• 40 healthy participants (20 males, 20 females), mean (SD) age = 19.95 (1.93) years.

Stress Task - Multi-Source Interference Task (MSIT)
• Participants have to select the number that is different from other numbers with their corresponding finger. Two alternating conditions: 1) Congruent: number matches finger position. 2) Incongruent: number different position to finger

Cardiovascular Assessment
• Blood pressure

Psychological Measures
• Cognitive anxiety, somatic anxiety, difficulty and stressfulness assessed via questionnaire (1 = not at all, 7 = extremely).
• Mood disturbance was measured with 32-item Profile of Mood States (1 = a little, 4 = extremely). A higher score represents greater mood disturbance.

3 Visits:
Visit 1: Sub-maximal exercise test to calculate fitness level (VO\(_2\) max).
Visit 2: Participants complete MSIT solo stress task.
Visit 3: Participants complete MSIT after 10-minute moderate-intensity cycling.
Note: visit 2 and visit 3 were counterbalanced in order of completion.

Results

<table>
<thead>
<tr>
<th>Task</th>
<th>Pre-Task</th>
<th>Post-Task</th>
<th>MSIT Solo</th>
<th>MSIT After Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic BP (mmHg)</td>
<td></td>
<td></td>
<td>113</td>
<td>311</td>
</tr>
<tr>
<td>Diastolic BP (mmHg)</td>
<td></td>
<td></td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

Figure 1. Showing blood pressure increases during stress. *Significantly lower during MSIT after exercise visit compared to MSIT solo visit, \(p<.05\).

Table 1. Mean (SD) scores of task appraisals for the MSIT solo condition and MSIT after exercise condition.

<table>
<thead>
<tr>
<th>Perceived Stressfulness</th>
<th>Perceived Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSIT Solo</td>
<td>3.26 (1.25)</td>
</tr>
<tr>
<td>MSIT After Exercise</td>
<td>3.82* (1.21)</td>
</tr>
</tbody>
</table>

*Significantly greater than MSIT Solo visit, \(p<.05\).

Figure 2. Showing anxiety and mood disturbance increases during stress. *Significantly greater than MSIT solo, \(p<.05\).

Conclusions

• Exercise is beneficial for blood pressure responses to stress, but increases anxiety, negative mood, perceived difficulty and reported stress.
• Exercising before a stressful event may chill your blood pressure, but fries your brain.