Physical activity and stress resilience: Considering those at-risk for developing mental health problems

Nicole J. Hegberg*, Erin B. Tone

Department of Psychology, Georgia State University, Atlanta, GA 30302, USA

1. Introduction

According to the Centers for Disease Control and Prevention (CDC), over 50% of adults in the United States fail to engage in recommended levels of physical activity (PA; CDC, 2012). This statistic is striking, given ample evidence that PA yields physical and mental health benefits, as well as potential protective effects. For instance, physically active individuals report reduced incidence of mental health problems and a dose-response relationship appears to exist between PA and mental health (Goodwin, 2003; Ströhle et al., 2007).

Substantial evidence links PA and psychological well-being; however, the path from PA to its notable psychological benefits is complex (Crone, Smith, & Gough, 2006). As the prevalence of stress-related mental health problems continues to surge (i.e., anxiety and depression; Kessler et al., 2005), much attention has focused on whether PA influences the stress response, or one’s resilience to stress [see A to C in Fig. 1, which depicts associations among PA, mental health, and study specific variables referred to throughout the introduction], as a means of promoting mental health [Fig. 1, D] (Tsatsoulis & Fountoulakis, 2006). That is, does PA improve an individual’s stress resilience, in turn, providing protection against stress-related mental health problems? Of note, we define resilience as the ability to respond and adapt successfully to acute or chronic adversity as a function of adaptive physiological/psychological stress responses (Feder, Nestler, & Charney, 2009). This definition is important to keep in mind, because researchers operationalize resilience in diverse ways.

Research using animal models lends ample support to the hypothesis that stress resilience at least partially accounts for the commonly observed negative association between PA and stress-related mental health problems. For example, the introduction of habitual PA prior to stress exposure (e.g., footshock, social defeat) attenuates the activation of, as well as changes in, physiological stress response systems that are typically observed in stressed individuals. This finding is consistent with our hypothesis that PA may confer protective effects on mental health by increasing resilience to stress via regulation of the stress response, the human literature offers inconsistent evidence regarding this idea. To help reconcile these inconsistencies, the present study of human adults tested the hypothesis that PA’s protective effects, as indexed by self-perceived resilience, vary according to individual differences in trait anxiety, which has been linked to a dysregulated stress response and risk for developing mental health problems. Specifically, we predicted that individuals reporting high trait anxiety (and thus presumably more stress response dysregulation) would show a stronger association between PA and self-perceived resilience, than would peers with lower reported trait anxiety. 

Methods: Undergraduate students (n = 222) completed online self-report measures regarding their PA level, trait anxiety, and self-perceived resilience. 

Results: Hierarchical linear regression analyses yielded evidence of a significant interaction between trait anxiety level and PA, such that PA and self-perceived resilience were significantly and positively associated among individuals with high trait anxiety, but not among individuals with low and moderate trait anxiety.

Discussion: In conclusion, individuals with high trait anxiety, which may be a risk factor for developing clinically significant mental health problems, may preferentially show psychological, as well as physiological, benefits from PA.

Article history:
Received 24 June 2014
Received in revised form 20 October 2014
Accepted 20 October 2014
Available online 1 November 2014

Keywords:
Exercise
Mental health
Stress response
Stress-coping ability
Trait anxiety
Cross-sectional study

© 2014 Elsevier Ltd. All rights reserved.
sedentary rodents (Dishman et al., 2006; Greenwood & Fleshner, 2011; Stranahan, Lee, & Mattson, 2008). Similarly, habitual PA appears to protect rodents against negative behavioral consequences of stress that resemble human anxiety or depression symptoms (e.g., social avoidance, exaggerated conditioned fear, and interference with instrumental learning) (Greenwood & Fleshner, 2011, 2013). In essence, the non-human literature suggests that habitual PA increases physiological and behavioral resilience to stressors, which may help prevent stress-related mental health problems.

Generally, the human literature indicates that people who exercise regularly have lower risk for developing stress-related mental health disorders than do sedentary peers (Gerber, 2013). In essence, the non-human literature suggests that habitual PA increases physiological and behavioral resilience to stressors, which may help prevent stress-related mental health problems.

Notably, much of the extant literature has focused on main effects, measuring associations between PA and stress resilience [see Fig. 1, A to C]. Limited research, in contrast, has examined moderators of such main effects. Therefore, there could be value in investigating individual differences that may serve as moderators, influencing the degree to which PA offers protective effects for different individuals. Findings from such research would help inform efforts to personalize prevention/intervention for mental health problems.

Table 1
Descriptive statistics, Cronbach’s alpha, and correlations in and between covariates and study variables (N = 222).

<table>
<thead>
<tr>
<th>Variable</th>
<th>M (N)</th>
<th>SD (%)</th>
<th>α</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>21.24</td>
<td>5.38</td>
<td></td>
<td>-.06</td>
<td>-.05</td>
<td>-.17</td>
<td>-.12</td>
<td>.14*</td>
<td></td>
</tr>
<tr>
<td>2. Gender¹</td>
<td>171</td>
<td>77%</td>
<td></td>
<td>-.04</td>
<td>.15*</td>
<td>-.12</td>
<td>-.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.12</td>
<td>-.003</td>
<td>-.19**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>66</td>
<td>30%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African</td>
<td>105</td>
<td>47%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>34</td>
<td>14%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. STAI-T Score</td>
<td>43.96</td>
<td>10.95</td>
<td>.91</td>
<td>-.05</td>
<td>-.63**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. GPAQ</td>
<td>2159.01</td>
<td>2806.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. CD-RISC</td>
<td>26.40</td>
<td>7.93</td>
<td>.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: GPAQ = Global Physical Activity Questionnaire—Recreational Activity; STAI-T = State Trait Anxiety Inventory—Trait Form X; CD-RISC = Connor Davidson Resilience Scale 10. The GPAQ α is not reported because the score comprises two items that are designed to measure different constructs.

¹p < .05; ²p < .01.
* Descriptive statistics are for the women in the sample.
متن کامل مقاله

دریافت فوری

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات