

# Anxiety sensitivity responsiveness to a brief aerobic exercise program based on aerobic fitness capability: Findings from a traumatized sample

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## Introduction

- Exercise has the potential to bring positive psychological changes to individuals with mental disorders, such as post-traumatic stress disorder (PTSD) through reductions in anxiety sensitivity (Sabourin et al., 2008).
- Anxiety sensitivity is the fear of anxiety-related sensations (e.g., racing heart, sweating) based on the perception that they have negative consequences (Reiss & McNally, 1985). It acts as both a vulnerability and a maintenance factor for PTSD (Asmundson & Stapleton, 2008), and it may also exacerbate PTSD symptoms (Marshall, Miles, & Stewart, 2010).
- Research suggests that exercise reduces anxiety sensitivity because it acts as a form of interoceptive exposure (Asmundson et al., 2013); however, high levels of anxiety sensitivity have been associated with diminished engagement in exercise and reduced fitness (Moshier et al., 2012; Sabourin et al., 2011).
- Although emerging research suggests aerobic exercise can reduce anxiety sensitivity in individuals with PTSD, little is known about how individuals' level of fitness may affect this relationship.

## Methods

- Data were from 32 participants (24 females; 75%) who reported trauma on the Traumatic Life Events Checklist (Carleton et al., unpublished measure) and PTSD symptoms on the Posttraumatic Stress Disorder Checklist – Civilian (Weathers et al., 1994) as well as high anxiety sensitivity measured with the Anxiety Sensitivity Index-3 (ASI-3; Taylor et al., 2007).
- Participants completed the YMCA submaximal cycle ergometer test to estimate their VO<sub>2</sub> Max. Individuals were divided into the following four aerobic fitness groups based on their test results: (1) excellent, (2) good, (3) fair, and (4) needs improvement.
- Participants completed six 20-minute exercise sessions on a stationary cycle at 60-80% maximum heart rate reserve over a two week period. Anxiety sensitivity was measured using the ASI-3 at pre-treatment, after each session, and at one week and one month follow-up.
- Two-level hierarchical linear modelling was used to assess changes in anxiety sensitivity during the intervention and differences after treatment. Missing data were imputed using predictive mean matching.

Table 1: Descriptive Statistics at Baseline

	Mean	(SD)	Minimum	Maximum
Age	36.75	11.30	18	60
PTSD Checklist – Civilian	51.20	13.12	21	74
Anxiety Sensitivity Index—3	38.66	12.78	16	64

Table 2: ASI-3 Scores

Fitness Group	n	Pre-treatment M (SD)	Post-treatment M (SD)	Week M (SD)	Month M (SD)
Excellent	3	40.00 (5.29)	28.67 (13.61)	35.00 (9.64)	40.00 (11.53)
Good	4	37.25 (17.54)	33.00 (13.52)	38.25 (19.33)	35.50 (16.62)
Fair	9	34.00 (10.84)	17.84 (10.58)	21.56 (15.41)	20.67 (12.05)
Needs Improvement	16	41.38 (13.70)	25.25 (15.00)	25.70 (18.56)	30.94 (17.21)

## Results

- Of the 32 individuals who entered the study, 26 (82%) completed the intervention, 21 (66%) completed the 1-week follow-up, and 15 (47%) completed the 1-month follow-up.
- Baseline ASI-3 scores were comparable to those reported for other PTSD samples (Naragon-Gainey, 2010). The *fair* group reported significantly lower anxiety sensitivity at baseline compared to the other groups,  $p < .01$ .
- All groups had significant reductions in anxiety sensitivity at post-treatment, all  $ps < .001$ , but these reductions were not fully maintained at follow-up (see Figure 1).
- The *needs improvement* and *fair* groups had steeper declines in anxiety sensitivity from baseline to post-treatment compared to the *good* group, all  $ps < .05$ . The *excellent* group did not differ from other groups in terms of declines in anxiety sensitivity, all  $ps \geq .28$  (see Figure 1).
- The *fair* group reported significantly lower anxiety sensitivity at post-treatment (S6) compared to those in the *good* group,  $p < .05$ . There were no other group differences in anxiety sensitivity at post-treatment, all  $ps \geq .13$ .

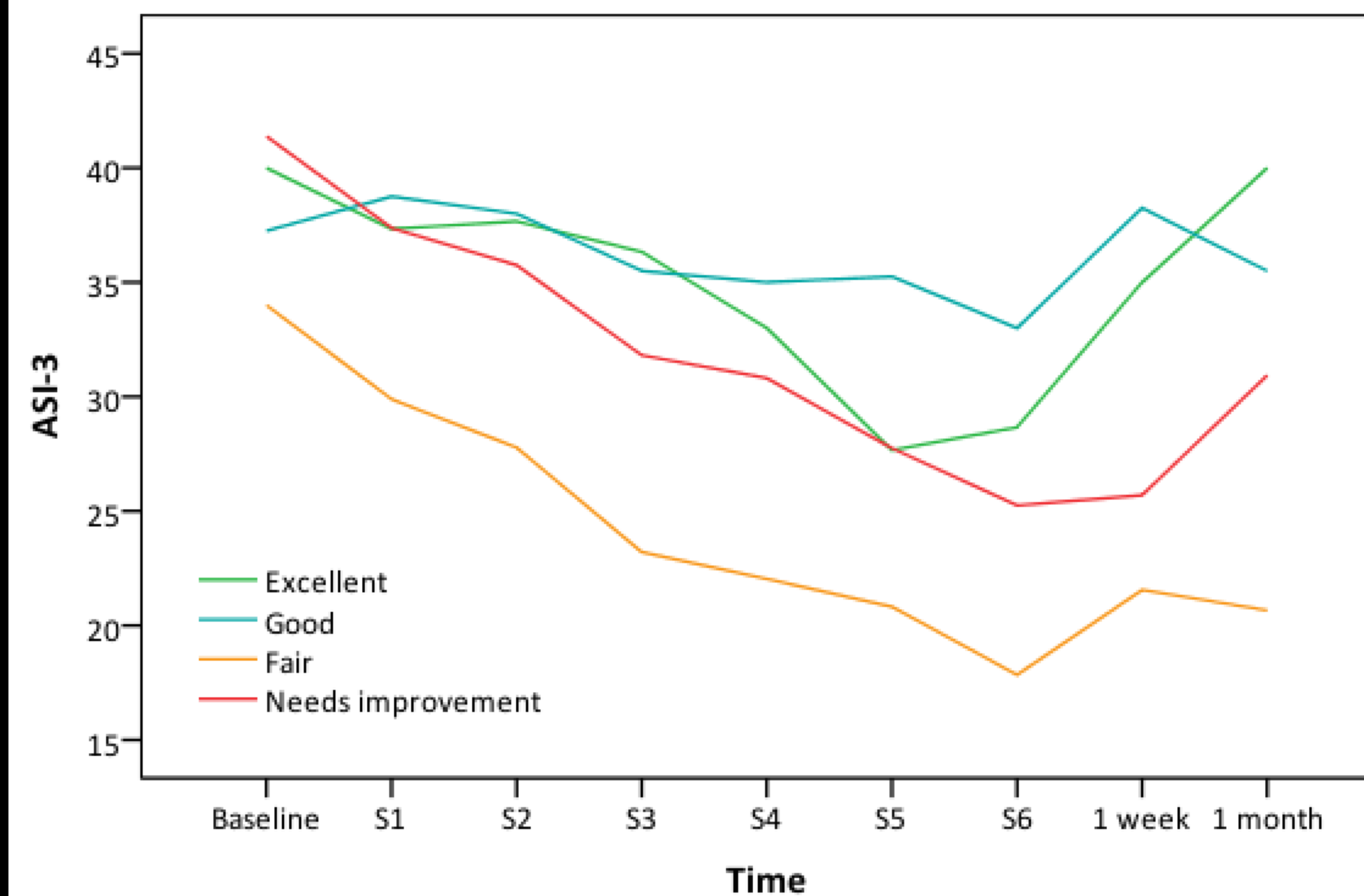


Figure 1. Anxiety sensitivity scores before, during, and after the intervention. S = session. Coloured lines represent fitness groups.

## Discussion

- The aim of our study was to quantify reductions in anxiety sensitivity according to individuals' level of fitness following a two-week aerobic exercise program. Our results echo those of previous studies suggesting that short aerobic exercise programs are effective in reducing anxiety sensitivity in individuals with high levels of the trait (Broman-Fulks et al., 2008; Smits et al., 2008).
- Reductions in anxiety sensitivity were not fully maintained at follow-up. Consistent physical exercise may therefore be necessary to maintain reductions in anxiety sensitivity over the long term.
- Participants with lower levels of aerobic fitness had the greatest reductions in anxiety sensitivity, while individuals with higher levels of fitness still received benefits, but to a lesser extent. Increased physical activity in already fit individuals may therefore yield diminishing returns. Alternatively, the use of aerobic exercise as a psychotherapeutic intervention may require specific tailoring in order to make the exercise challenging and maximize therapeutic benefits.

