

The effect of endurance exercise on stress-induced mood

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Background

A wealth of data has shown that depressed mood might also be triggered by environmental stress. A recent animal study suggests that physical activity induces changes in kynurenine metabolism and thus protects from stress-induced depressive mood (Agudelo et al., 2014). The study suggested that overexpression of PGC-1 α in skeletal muscle (which mimics adaptation to endurance exercise) mediated resistance to stress-induced depressive behaviour.

Based on the findings that exercise-induced PGC-1 α expression in skeletal muscles might protect against stress-induced neurobiological mechanisms of depressed mood, the study compared stress-induced mood in long-distance runners (who prior to the stress manipulation test performed endurance training) and the control group.

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Methodology

Participants

White male adults between the ages of 28 and 48 were recruited for this study ($N = 54$). The experimental group comprised long-distance runners with 2-5 years of experience in running and similar times in covering the half-marathon distance ($n = 29$). The control group comprised non-athletes ($n = 25$).

Methods

- DASS-21 (Lovibond & Lovibond, 1995) was used to measure negative emotional states of Depression, Anxiety and Stress.
- Mood Adjective Check List (UMACL) (Mathews, Chamberlain & Jones, 1990, adapted to Polish by Ewa Goryńska, 2005) was used to assess mood. It measures mood in the three dimensions: Tense Arousal, Energetic Arousal, and Hedonic Tone.
- Trier Social Stress Test (TSST) (Kirschbaum, Pirke & Hellhammer, 1993) was used to induce stress in participants.

Procedure

At the start, DASS-21 and UMACL were used to assess mood. Following this, the group of long-distance runners participated in VO₂ Max endurance test on a treadmill. The control group did not engage in any form of physical activity. A stress response was then induced with the TSST in both groups of participants. After the stress manipulation test, mood was reassessed.

Results

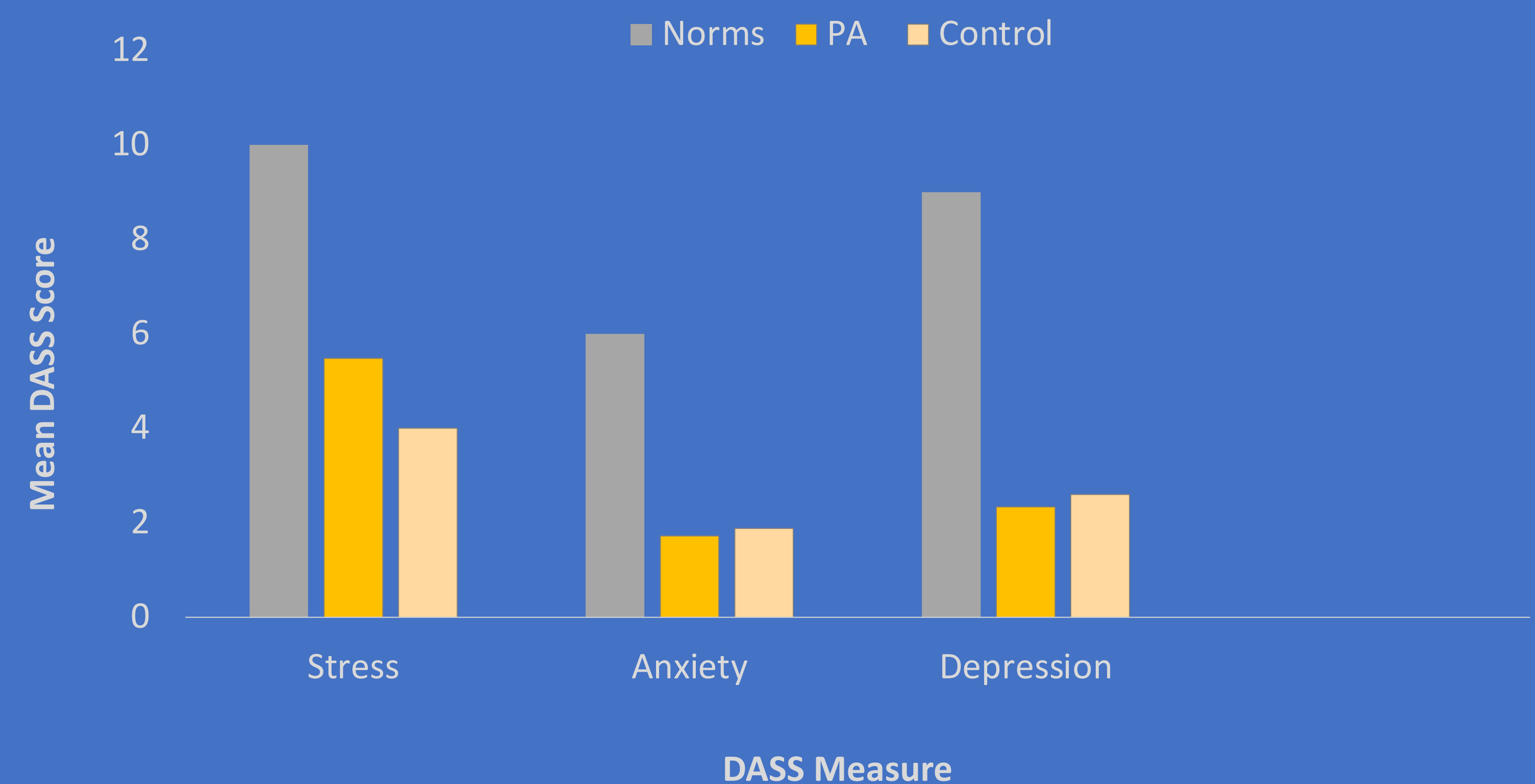


Fig. 1 Comparison of results with existing norms for the DASS-21

In most cases, DASS measures' scores for both groups were within the norms. Across the groups, majority of participants had normal stress ($n = 48$) anxiety ($n = 50$) and depression ($n = 52$) levels.

There was no statistical difference in stress, anxiety or depression levels between the two groups. ($t = .48$, $p = .63$).

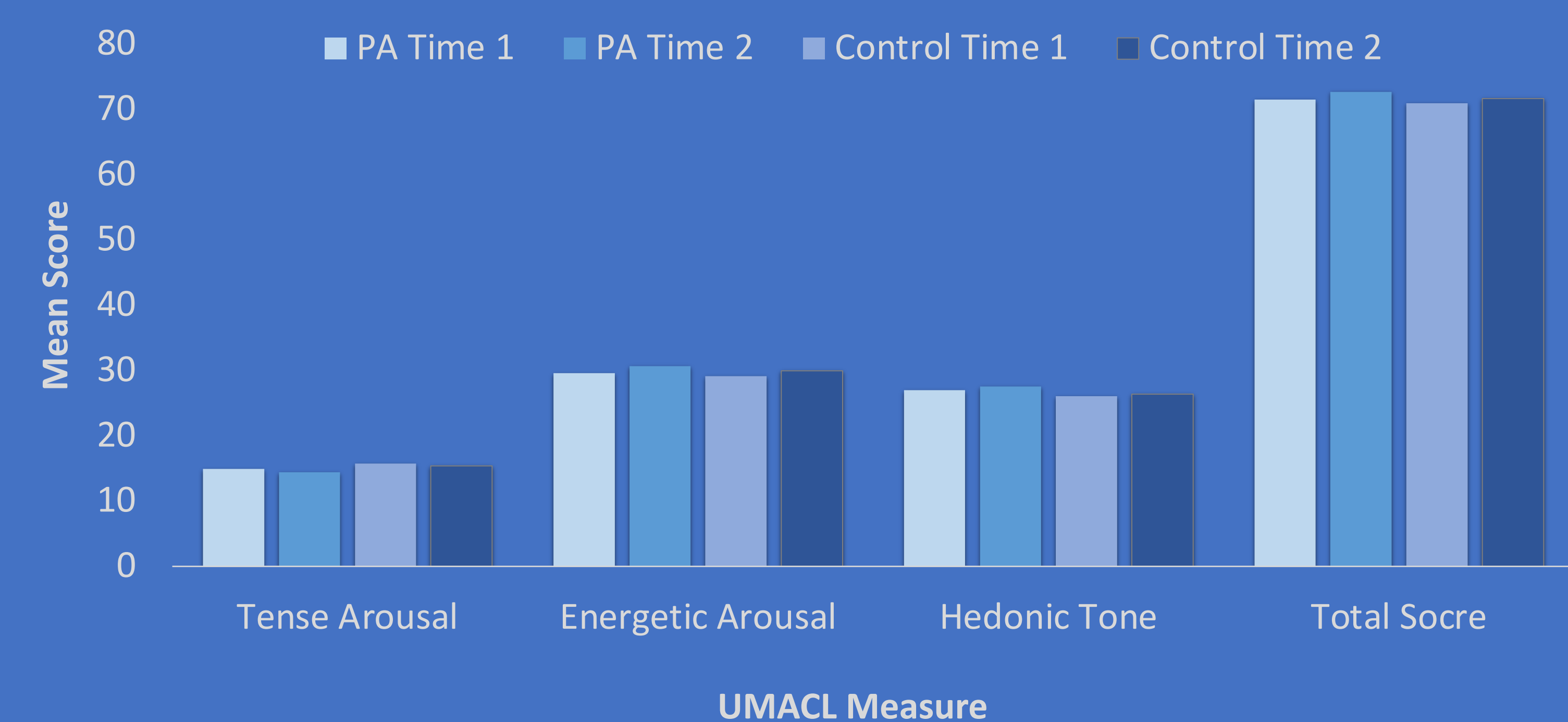


Fig. 2 Comparison of results for the UMACL measures

There was no statistical difference in participants' mood between the two groups before performing the stress manipulation test ($t = .56$, $p = .579$) and after performing the stress manipulation test ($t = .90$, $p = .375$).

Conclusion

The study examined the effect of endurance exercise on stress-induced mood. No statistical differences were found between the mood of long-distance runners (who prior to the stress manipulation test performed endurance training) and the control group, after performing the stress manipulation test. While the study solely analysed data from psychological questionnaires, the follow-up of the current study will examine biochemical parameters, which might be more sensitive to change.

References

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