9th

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Mountain, Sport & Health

updating study and research
from laboratory to field

16-17 November 2023 Rovereto (TN) Italy

BOOK OF ABSTRACT

UNIVERSITÀ di VERONA

CeRiSM research center sport mountain health

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Acute physiological and psychological responses to exercise in indoor and outdoor environments in built and natural surroundings

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Introduction. Exercising in natural green environments (i.e. green exercise) has been suggested to provide superior physiological and psychological health benefits, in comparison to urban, synthetic or indoor environments (Gladwell et al., 2012). This study aimed at evaluating the acute physiological and psychological restorative effects of a 1-h light-to-moderate intensity green exercise session.
Methods. In a randomized crossover design, 15 healthy male subjects (age: 28±5 years, BMI 22.7±2 kg/m2, VO2max: 56.1±6.6 mL/min/kg) performed a 60-min walking protocol at a controlled pace (6 km/h) in three different environments: green natural (forest park, G), built outdoor (urban, U) and built indoor (laboratory, I). Heart Rate Variability (HRV), Salivary Cortisol and Blood Pressure (BP) were assessed before and after the intervention. Questionnaires for psychological assessment including the Perceived Restoration Scale (PRS), the Restorative Outcome Scale (ROS), the Brief Achievement Emotions Questionnaire (AEQ) and the Physical Activity Enjoyment Scale (PACES) were administered.
Results. Systolic BP and salivary cortisol were significantly reduced (all $p<0.05$) after the exercise interventions (mean decrease -3.6±2.2 mmHg and -2.58±2.1 nmol/L, respectively). G was associated with a lower salivary cortisol concentration (3.1±1.7, all $p<0.05$) compared to U (4.6±2.5) and I (4.1±2.4 nmol/L). A significant effect of the environment was found on vagal-related HRV indices, which were higher in the post-exercise period in G compared to I ($p<0.05$). Psychological measurements revealed more relaxation, less anxiety, more restoration and a better mood after G compared to the other environments (all $p<0.05$).
Conclusions. These results indicated that one hour of light-to-moderate intensity exercise conducted in a natural green environment elicited positive physiological and psychological stress-related responses. The study also highlighted the higher restorative power of a green natural environment compared to other built environments.

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References:

Gladwell VF, Brown DK, Wood C, Sandercock GR, Barton JL. The great outdoors: how a green exercise environment can benefit all. Extrem Physiol Med. 2013 Jan 3;2(1):3. doi: 10.1186/2046-7648-2-3.

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