

Abstract

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Title: Effects of physical activities in natural environments on the autonomic nervous system.

Objectives: The aim of this study was to compare the effects of laboratory and nature environments on heart rate variability during walking.

Methods: Seven participants underwent a 40-minute walk test under laboratory conditions and in an urban environment with natural features, while heart rate variability (HRV) was measured. Kubios software was used to process and evaluate the data, which allowed detailed analysis of seven HRV indicators: heart rate, RMSSD (Root Mean Square of Successive Differences), SD1 (Standard Deviation 1), SD2 (Standard Deviation 2), Stress index, PNS (Parasympathetic Nervous System), SNS (Sympathetic Nervous System). Thanks to these indicators we can monitor in detail the organism's reactions to external stimuli.

Results: The mean rate in the laboratory was 79 beats/min and 92 beats/min in the nature environment; RMSSD was 35ms in the laboratory and 23ms in the natural environment; SD1 was 30% in the laboratory and 34% in the natural environment; SD2 reached 71% in the laboratory and 66% in the natural environment; Stress index reached 10 in the laboratory and even 14,5 in the natural environment; PNS was -0,95 in the laboratory and -1,65 in the natural environment; SNS had values of 0,97 in the laboratory and 2,85 in the natural environment.

Conclusion: The natural environment elicited greater sympathetic nervous system activity, whereas the laboratory measurements elicited more parasympathetic nervous system activity. However, the results cannot be generalized due to participant selection and low control of confounding variables.

Keywords: Green Exercise, Heart rate variability, Sympathetic nervous system, Parasympathetic nervous system, Walking, Stress