

Abstract

- Title** Energy expenditure of slackline walking
- Objectives** The aim of this study was to investigate the energy expenditure of slacklining in intermediate and advanced slackliners.
- Methods** In this observatory study, 19 slackliners (10 intermediate, of which 7 men and 3 women, 9 advanced, of which 7 men and 2 women) completed experimental energy expenditure measurement of slacklining using indirect calorimetry. The MetaMax 3B metabolic analyzer (Cortex Biophysik, Germany) was used to determine respiratory parameters and the heart rate monitor (Polar Electro OY, Finland) was used to determine the heart rate (HR). Comparative statistical tools were used in the data analysis.
- Results** Relative energy expenditure of $0,471 \text{ kJ}\cdot\text{min}^{-1}\cdot\text{kg}^{-1}$ was found in intermediate slackliners and $0,377 \text{ kJ}\cdot\text{min}^{-1}\cdot\text{kg}^{-1}$ in advanced slackliners in walking on a 10 m long slackline at a constant speed of $15 \text{ m}\cdot\text{min}^{-1}$. In the static standing on slackline, the relative energy expenditure was found to be $0.368 \text{ kJ}\cdot\text{min}^{-1}\cdot\text{kg}^{-1}$ in intermediate slackliners and $0.289 \text{ kJ}\cdot\text{min}^{-1}\cdot\text{kg}^{-1}$ in advanced slackliners. The weighted arithmetic mean for HR in men and women walking on the slackline at $15 \text{ m}\cdot\text{min}^{-1}$ was at 67.3% of the predicted HR_{max} (220 - age for men, 226 - age for women). The MET value in the advanced group (n = 10) was set at 5.15, and in the intermediate group (n = 9) at 6.44.
- Conclusion** Slackline walking can be considered as an activity of between medium and high intensity according to the values of EE and HR. The static standing on the slackline shows a load several times higher than standing on the ground. Walking speed, in some cases, significantly influences EE and HR.
- Keywords** Balance, equilibrium, postural control, stability, gait, indirect calorimetry, MET