

Abstract

Title: Energy expenditure of exercise on stable and unstable surfaces

Objectives: The aim of this study was to investigate the difference between energy expenditure of exercise on stable and unstable surfaces.

Methods: Ten athletes (aged 27.4 ± 2.67), current students or graduates from Faculty of physical education and sport at Charles University, took part in this study. The study was an intragroup randomized experiment. Energy expenditure was determined by spiroergometry based on inhaled O₂ and exhaled CO₂. The metabolic analyzer MetaMax 3B was used to determine respiratory parameters. The measured data were analyzed through basic statistical operations.

Results: The highest average energy expenditure of 252,6 kJ was measured for dynamic exercises on unstable surfaces. The value for the average energy expenditure on stable surfaces was 225,7 kJ. This was followed by energy expenditure of static exercise on unstable surfaces, where the average value was 205,4 kJ. Proband showed the lowest energy expenditure during static exercise on stable surfaces, where the average value was 177,5 kJ. The average difference between static exercise on unstable surfaces and static exercise on stable surfaces was 15,9 %. The difference between dynamic exercise on unstable surfaces and dynamic exercise on stable surfaces was 12,3 %.

Conclusion: Proband achieved the highest average values of energy expenditure during dynamic exercises on unstable surfaces. We found out that the energy expenditure of exercise on unstable surfaces is higher than exercise on stable surfaces.

Key words: energy expenditure, stable surfaces, unstable surfaces, exercise, balance aids, spiroergometry