

**Klíčová slova:** Dokrok, oporová záže, běžecký krok, pronace.

## **Abstract**

**Title:** Dynamic analysis of the support phase of running step at different running techniques

**Objectives:** The aim of the thesis is to make a dynamic analysis of the support phase of running step at the three chosen probands with different speeds and running techniques. The aim is also to find the differences in pressure and duration of the support phase of running step. Further, to assess the influence of the character of ground surface on the musculoskeletal system of the runner during the forefoot landing and heel strike landing.

**Methods:** The experiment was used as a method of research, i.e. the observation and measurement under the artificially created conditions. It was a multi-factor experiment conducted under the laboratory conditions. Furthermore, we applied the method of analysis at processing of particular measured data and the method of comparison at comparing of all probands.

**Results:** We found that forefoot running is characterized by bigger effect of the total pressures in the forefoot. Muscle activity is also higher. Duration of the support phase is shorter at maintaining of the same running speed. The value of first two quantities increases with the increasing speed. Therefore, the higher pressure concentrated in a smaller surface is measured at forefoot running than at heel strike running. Hence, this technique is more demanding for calf muscles and Achilles tendon and generally on the complex of lower extremities. The higher speed represents higher demands for lower extremities. On the other hand, the forefoot running is faster than heel strike running, although this difference is smaller than we expected.

**Keywords:** running step, support phase, foot landing, pronation