

## **ABSTRACT**

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FIELD OF STUDY: Tělesná výchova a sport

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### **Title:**

Evaluation of pressure changes during the stance phase of running in competitive runners and triathletes.

### **The aim of the study:**

The aim of this thesis is to determine, whether any changes in plantar pressure distribution occur in competitive distance runners during the stance phase of continuous steady running and continuous accelerating running depending on increasing fatigue and loading intensity, as well as, to show a practical significance of tensometrics for running technique and running economy evaluation, and show the options of its application in prevention of structural and functional changes of foot resulting from an extreme loading.

### **Methods:**

The thesis has a character of a pilot study. Non-homogenous group of five distance runners - two competitive male runners, two competitive female runners, and one recreational male runner, participated in this study. The analysis of plantar pressure distribution during the stance phase at the initial as well as final stage of continuous run was performed using Novel Pedar-X system. One male competitive runner and one female competitive runner underwent continuous, gradually increasing loading, during which changes in plantar pressure distribution and foot contact time were observed depending on increasing running speed. The other subjects – competitive male runner, competitive female runner and recreational male runner underwent continuous steady loading, during which changes in plantar pressure distribution and foot contact time were observed depending on increasing fatigue.

### **Results:**

No changes in plantar pressure distribution have been shown in any of the competitive distance runners during the continuous accelerating run. Depending on increasing running speed, however, the foot contact time has been reduced. Similarly, no changes in plantar pressure distribution have been detected in any of the competitive distance runners during the

continuous steady run. However, significant change in terms of shifting peak pressure areas forward to the forefoot has occurred in context of increasing fatigue during the continuous steady run in recreational runner. The foot contact time during the continuous steady run has not changed in competitive male and recreational runner. However, it has extended in female competitive runner.

**Key words:**

Stance phase of running, running technique, running economy, mechanical efficiency of running, tensometrics, Pedar-X system