

Abstract

Title: Influence of the breathing muscles using POWERbreathe.

Objective: The main object of this thesis is to determine, if it is possible to use 3D kinematic analysis to measure changes of trunk shapes during quiet breathing and breathing when using POWERbreathe and if it is possible to identify the changes.

The thesis is divided to two parts. The first part contains theoretical part, focused on issue of kinesiology and biomechanics of breathing. The special part is concentrated on research, where I find changes of trunk kinematics during application of POWERbreathe.

Method: Measurements were made on 6 probands in the same age category (women), when each measurement was performed during quiet breathing, maximum inhale/exhale, resistive breathing when using POWERbreathe and then another quiet breathing and maximum inhale/exhale. Quiet breathing was chosen as benchmark. The experimental measurements was done during one day. The research was used 3D kinematic motion analysis using system Qualysis. Were observed changes in the shape of the trunk and possibly caused breath changes during using POWERbreathe.

Results: Measurements has confirmed, that the system Qualysis is able to detect mobility and the trunk shape changes. At a certain threshold load device POWERbreathe prevailed movements cranial direction in the upper part of trunk compared with lateral movements with the middle and lower trunk.

Key words: POWERbreathe, 3D analysis, IMT, kinematics, diaphragm, dynamics of breathing