

## **Abstract**

**Title:** The effect of kinesiotaping for flat foot correction in association with selected parameters of gait for a specific group of people

**Objectives:** The primary objective of this experiment was to determine whether and to what extent the application of kinesio tape to flat foot (utilising a functional correction technique) can influence the positioning of the specific segments of the body and thereby implement change to walking stereotype.

**Methods:** Biomechanical measurement of the gait of eleven specifically selected people with the clinical symptoms of flat foot was implemented. First we recorded measurements prior to the intervention and then again, subsequent to the application of kinesio tape for a defined period. Proband retained the tape in place for the following four days and then the measuring was repeated both prior and subsequent to the removal of the tape. To determine any potential changes to the statics, initially the measuring of the postural stability prior to the intervention was first implemented in the experiment and subsequently again when the kinesio tape was removed after it had been worn for four days. This measurement was carried out using the Footscan apparatus (RSscan International, Belgium) and any potential differences in six variant modes of posture were determined. Additionally we also focused on the dynamic parameters during walking. To assess whether any direct changes to the foot and its arch had taken place we used the footprint that we had obtained using the Footscan apparatus (RSscan International, Belgium). Thereby it was possible to monitor the distribution of the pressure applied to the substrate and also its shape. In accordance with the lines plotted on a podogram and with the pressure readings obtained from specific areas of the foot, we were able to obtain the specific requisite values for calculating the differences between before and after the intervention,

which were subsequently, statistically analysed using the Microsoft Excel (Microsoft) and the SPSS (IBM) programmes. We calculated the basic descriptive statistics (the mean value, the standard deviation) on the basis of the data measured and then, using the paired T-test we determined whether this difference was statistically significant ( $p < 0.05$ ). To quantify the potential changes both before and after the intervention, we also utilised 3D kinematic gait analysis, enabled through the CODA Motion System (Charnwood Dynamics Ltd., England). Required data was obtained using CODA Motion Odin software. The paired T-test was used again for the determination of the differences between the specific gait parameters both before and after the application of the kinesio tape. The hypotheses were tested for statistical significance level of  $p < 0.05$ . The distribution of forces during the step cycle was recorded using Kistler force plates (Kistler GmbH, Switzerland) and values measured were statistically analysed, this time by means of the ANOVA test.

**Results:** The biggest difference observed was in regard to the change of the height of the arch. In this context it was confirmed that the application of the kinesio tape would inevitably lead to an increase of the height of the longitudinal arch of the foot and this situation would persist, in most cases, even after the removal of the tape after it had been worn for four days. Statistically significant differences weren't observed in regard to the parameters related both to the changes in the load of the foot during walking and to the balance of power in the step cycle. The results of the kinematic analysis suggest that there was a slight increase in the range of motion of the hip, knee and ankle joints in the sagittal plane, however only in two cases was this statistically significant. Also the effect on postural stability was only marginal.

**Keywords:** gait, flat foot, kinesiotaping, kinematic analysis, dynamic parameters, postural stability