

Summary

Introduction;

In the available literature, there are many discrepancies in the results of studies assessing posture and gait pattern in people wearing heeled shoes. At the same time, there are no research results, that assess the potential impact of training on preventing the negative effects of using high-heeled shoes.

The main aim of the conducted research, was to determine the impact of CFS (Core First Strategies) exercises, on changes in the kinematic and kinetic stereotype of gait in the area of spatiotemporal parameters, ranges of changes in intersegmental angles, components of the ground reaction force, ranges of changes in oscillation of the center of gravity energy components, the value of positive external work and the recovery index, in the group of women walking without shoes and in high heels, against the results of the control group.

Another aim was to indicate the differences, between the two gait stereotypes in both study groups.

Material and methods:

Women aged 18-40 who used high heels for up to 5 hours a day, were qualified for the project. Qualification to the group of subjects, was based on a questionnaire verifying past injuries, pain, potential neurological or orthopedic conditions that could affect gait pattern, and an orthopedic examination by a doctor.

A total of 60 women aged between 18 and 40 (mean age 25.13) participated in the study, 30 of them were randomly assigned to the experimental group, and 30 to the control group. People qualified for the experimental group were to perform a set of CFS exercises every day for a month, according to strictly defined scheme described in the research methodology.

The test of self-selected gait at natural speed without shoes and then in shoes with 8 cm high heels for each person, was performed twice, one month apart. The Vicon 250 system was used, to record the gait, used to study the spatial analysis of movement coupled with dynamometric platforms.

The values of spatiotemporal parameters, ranges of changes in intersegment angles, maximum standardized values of the components of the ground reaction force, ranges of standardized changes in the components of kinetic and potential energy, positive external work and energy recovery index were analyzed. The analysis of the results was based on the assessment of the significance of differences in the studied variables within the intergroup and intragroup comparisons.

Results:

After applying the experimental set of CFS exercises, the effects of its impact on the kinematic and kinetic gait pattern were observed, both in the study without shoes and in heeled shoes. The analysis of the study results showed a number of significant differences in kinematic and kinetic gait stereotypes in the intergroup and intragroup, comparisons in the initial and follow-up study, between the study groups and subsequent studies. Statistically significant changes concerned: spatiotemporal parameters, ranges of changes in intersegmental angles, maximum standardized values of the components of the ground reaction force, ranges of standardized changes in the components of kinetic and potential energy, positive external work and energy recovery index.

Conclusions:

Based on the results of our own research, it can be concluded, that the stereotype of walking with a natural speed without shoes differed in relation to walking in shoes with an 8 cm heel, both in the area of numerous kinematic and kinetic variables, in both examined groups of people. CFS training caused significant changes in the follow-up study, both in the kinematic and kinetic gait pattern, in both forms of locomotion. It also increased the differences between the analogous variables in the kinematic and kinetic patterns of gait without shoes and with shoes with a heel, compared to the results obtained in the control group. CFS training turned out to be an effective tool in improving the control of the locomotor system, which allowed to increase the speed of walking in high heels, while maintaining control over changes in the position of the general center of gravity of the body.

The use of the prophylactic set of CFS exercises can be used in activities where balance control plays an important role for their safe and effective performance.