THE INFLUENCE OF THE ELEVATION OF THE LANDING PLACE ON THE EXECUTION OF THE BACKWARD SOMERSAULT

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INTRODUCTION: To improve performance in gymnastics free exercise, various specific methods are employed. One method used with the backward somersault is to employ an elevated landing place. According to some sport practitioners, such a change of conditions should evoke a greater effort by athletes during take-off, and the resulting general center of gravity (GCG) path during the flight phase should be higher. The aim of this paper was to identify kinematic parameters which changed under various conditions, and which remained unchanged, when using various heights of landing surface for the backward somersault.

METHODS: The experiment was carried out with five experienced athletes who were leading European competitors. Each subject performed backward somersaults, landing on a landing place elevated at foru different heights: 0.08, 0.24, 0.40 and 0.48 meter. The experiments were recorded with a 50 Hz video camera. Two-dimensional kinematic analysis of all somersaults yielded the parameters which described how the motor task was accomplished. Average values of of the chosen parameters were calculated, along with standard deviations. Relative angles in the shoulder, knee and hip joints were measured at chosen moments, as well as the trajectory of the general center of gravity of the body and maximum height of the flight. Average values of the parameters under consideration were calculated from among 15 trials (3 trials made by each of the 5 subjects). The data obtained for each of the elevations of the landing place were compared.

RESULTS: The employment of an elevated landing place as a measure for evoking greater effort on the part of the competitor during the trial did not result in a change of kinematic parameters during the main phase of the motion. The final part of the motion changed significantly, however. The higher landing place caused the competitor to land in a very inconvenient position, which made keeping of balance more difficult. This forced him to choose another way of landing. It can be concluded that the exercise might be accepted as a technique for the improvement of landing technique only, but it does not significantly influence the performance of the main part of the backward somersault.

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