

Abstract

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The impact of inclination and external load on the spatiotemporal gait parameters of Special Forces Operators

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The aim of the study was to determine the impact of external load and ground inclination on the spatiotemporal parameters of the gait of special forces operators. Additionally, gait asymmetry between the dominant and non-dominant limbs was assessed.

The study involved 50 active special forces operators. The research was conducted using a specialized h/p/cosmos gaitway treadmill, which enabled the measurement of spatiotemporal parameters divided into unilateral and bilateral parameters. The research procedure included the soldiers' gait under three external load conditions (0 kg, 7 kg, 27 kg) and four inclination conditions (0%, 5%, 10%, 15%). Asymmetry for both limbs was assessed using the Robinson symmetry index.

The analysis showed statistically significant changes for most of the analyzed parameters. Key modifications concerned the duration of individual gait phases. With the increase in load and inclination, a systematic increase in the stance phase and a shortening of the swing phase were observed. The duration of the load response and pre-swing subphases of the limb regularly increased, which is a response to the need for greater stabilization and shock absorption. The value of the symmetry index remained similar in all analyzed cases, not exceeding 1%. In summary, the low value of the symmetry index and changes in the stance phase indicate a high level of adaptive abilities of special forces operators.