

# 論文の欧文要旨

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**(Title)**

Consideration of useful simple parameters for coaching endurance runners: focused on step characteristics and jump performance

**(Abstract)**

The present study aimed to obtain knowledge of useful simple parameters for coaching endurance runners by examining the relationship of step characteristics during 5000-m race and jump performance with race performance and condition status in endurance runners.

In the first study, twenty-one male endurance runners performed a 5000-m race and step characteristics during the race were measured by using high-speed video image. Then, relationships between step characteristics and race performance were determined. In the second study, twenty-two male endurance runners performed the jump tests of rebound jump and counter movement jump. Moreover, they performed a 5000-m race and step characteristics during the race were measured. Relationships between jump performance and step characteristics during the race were determined. In the third study, four male endurance runners performed three 5000-m time trials and step characteristics during the time trials were analyzed. Furthermore, the jump performance test, subjective fatigue feeling and running distance of their daily training were measured prior to each time trial. Then, the relationship of step characteristics and jump performance with race performance and condition status were observed longitudinally.

In the first study, higher step frequency and step length normalized to body height correlated with better race time. Additionally, smaller changes in contact time and step length correlated with better race time. In the second study, higher rebound jump index correlated with shorter contact time during the 5000-m race. Moreover, this correlation was strongest in the final lap. Only in the final lap, higher rebound jump index correlated with higher

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running speed. In the third study, changes in rebound jump index were similar to changes in 5000-m time, subjective fatigue feeling and running distance throughout three trials. Moreover, changes in average step frequency, average step length and percent change in contact time were similar to changes in 5000-m time throughout three trials. These findings suggests that step characteristics and rebound jump performance may be useful for assessing race performance and condition status in endurance runners.