



Ph.D / Associate Professor

Hikari Naito**Education**

Sports and Health Course, Lifelong Education Program, Faculty of Education, Aichi University of Education, Coaching Sciences, Department of Comprehensive Human Sciences, University of Tsukuba (Doctoral Program)

Professional Background

Concurrent lecture at the Faculty of Liberal Arts, Tokyo University of Technology, Junior assistant professor at the Sports and Physical Education Center, Tsukuba University, NSCA-certified strength and conditioning specialist

Consultations, Lectures, and Collaborative Research Themes

Consultation and lectures on muscle strength and speed training in competitive sports. Collaborative research on physical fitness evaluation and training for athletes and children.

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Main research themes and their characteristics**[Step type-specific characteristics of sprinting performance in 100-m sprinters]**

The 100-m sprint race can be generally divided into three main phases: acceleration (0-30m), maximum speed (30-60m), and deceleration (60-100m). The race time is strongly correlated with the maximum sprinting speed over 100-m. Sprinting speed is the product of step-frequency (SF) and step-length (SL), and there were wide varieties of combination of SF and SL for homogeneous sprinters. However, there is no study that has investigated type-specific step characteristics during acceleration phase of sprinters who are able to achieve high the maximum sprinting speed during 100-m race. The purpose of this study was to show the type-specific, based on the reliance of SF or SL, step characteristics in acceleration phase.

As a result, the sprinters were classified into SL-groups, SF-groups, and Mid-groups. In SL-groups, good sprinters showed a longer SL from the 7th step to maximum speed phase than the poor sprinters. In SF-group, good sprinters showed a higher SF from the 7th step to maximum speed phase than the poor sprinters. These findings could be useful for making training methods to improve a sprinter's 100-m sprint performance.

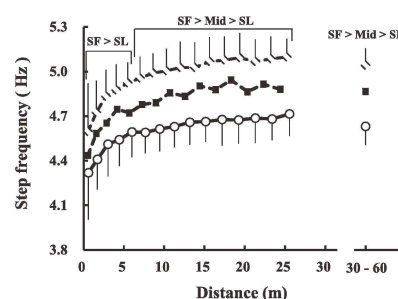


Fig.1 Comparison of changes of step frequency of each step during acceleration phase

[Cross-sectional study on age-related development of Change of Direction speed]

In many field and court sports, change of direction speed can result in a break, a score or shift in the momentum of the game. These ability are defined as the agility. Although agility has been extensively investigated across various athlete populations, little research has been done in children. The purpose of this study was to investigate the age-related development of the agility and Change of Direction speed (COD) in late childhood and to examine the characteristics of lower-leg power measured by the jump exercise in children who have superior COD ability.

The COD performance was measured by the 505 COD test. The COD deficit was calculated to isolate COD ability independent of sprint speed. The COD performance (505 total time) was significantly higher at the age of 12 years than 10 years old. The development of COD performance was not dependent on the COD ability but on increasing linear sprint speed. The children who have superior COD ability and sprint speed had significantly higher counter movement jump performance compared to other groups. These results are indicated that technical instruction need to improve the change of direction for late childhood. When coaches instruct children COD skill, they have to consider children's the development status of physique and sprinting performance.

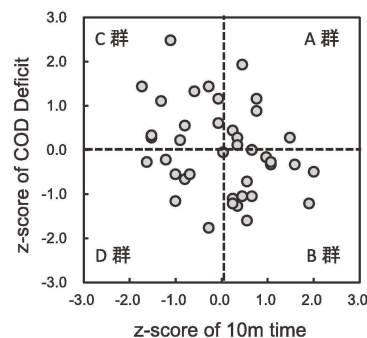


Fig.2 Classification of development status based on sprinting speed and change of direction speed.

Major academic publications

Hikari Naito, Yasushi Kariyama, Kenji Miyashiro, Kohei Yamamoto, Mitsugi Ogata, and Satoru Tanigawa. "Type-specific step characteristics of sprinting during the acceleration phase in 100-m sprint." Japan Journal of Physical Education and Health Sport Science, 58. (2013), 523-538.

Hikari Naito, Yasushi Kariyama, Kohei Yamamoto, Kenji Miyashiro, Satoru Tanigawa. "Intra-individual variations of stride length and stride frequency in 100-m race during competition period." Japan Journal of Studies in Athletics, 15 (1), (2017), 55-66.